OPTICAL AccuChrom3™ ALIGNER

GLED-600

(Sagittal)

GLED-800

(Crosshair)

Installation and User's Guide

Gammex

Table of Contents

NOTE: Installation Template was shipped with your patient positioning unit. For replacement template, please use Gammex part number: 007882

Dear Valued Customer

Congratulations on your recent purchase of a Gammex Optical Alignment System! This optical alignment system product is the result of over 40 years of continuous quality improvement of alignment technologies. If, after carefully reading this manual, you have any questions, please contact our Sales and Service Department at 1-800-Gammex 1 or 1-800-426-6391.

Introduction

This Installation and User's Guide includes the information you will need to safely and efficiently install, operate and maintain your medical alignment system. This guide is only intended for use with Gammex *AccuChrom 3 models GLED-800 (Crosshair) and GLED–600 (Sagittal)*.

Intended Use

These optical alignment products are intended to be used for aligning patients to medical diagnostic imaging and radiation therapy equipment which utilizes ionizing radiation. They are intended to be used in medical clinic or hospital settings by trained medical staff. The optical alignment products are not designed to be used around flammable anesthetics, which present a risk of explosion or fire. The optical alignment products are not intended to be used in a sterile or corrosive environment. No other uses are intended nor implied.

Storage and Transportation

- Do not drop
- Non-corrosive environment
- Storage Temperature: -20 to +40° C (-4 to +104° F)
- Storage Humidity: 0 to 85% relative humidity (no dew nor condensation)

Environmental Limits:

- Operating Temperature: +5 to +35° C (+41 to +95° F)
- Operating Humidity: 0 to 85 % relative humidity (no dew nor condensation)
- No flammable anesthetics
- No corrosives

General Safety

Signal words are used according to international standards. The meanings of these signal words are:

DANGER - Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING - Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION - Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. Permitted for property damage only accidents.

Sagittal - Single vertical line projecting

Crosshair - Crossed line projecting

Iso-center - Center point where the X, Y and Z planes coincide.

Indicates user to consult accompanying document

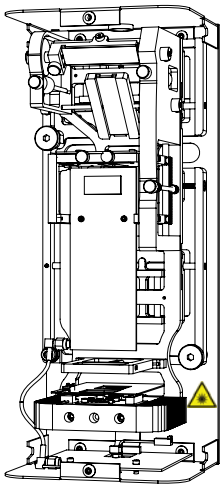
This symbol indicates that when the end-user wishes to discard this product, it must be sent to a separate collection facility for recovery and recycling.

Caution - Optical Radiation Risk of eye damage. Do not stare directly at light source.

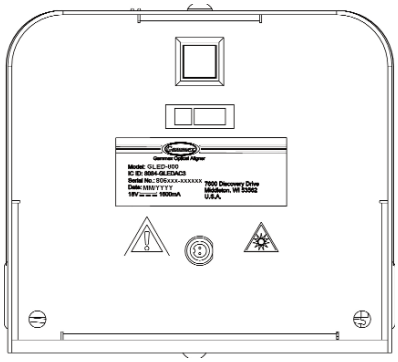
Location of labels

Safety labels are located in two places on the Optical Aligner:

1) On the Optical Aligner back plate



2) Bottom outside of housing

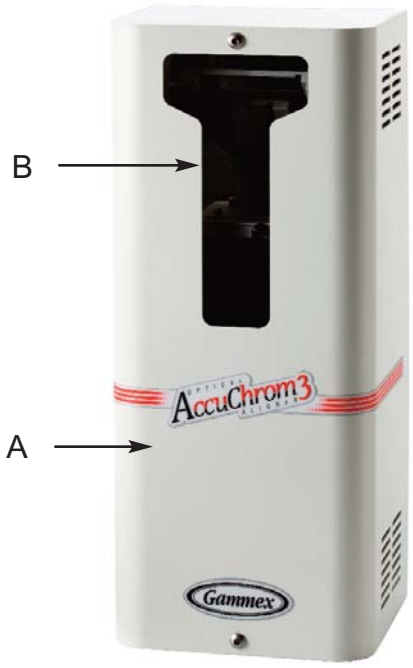


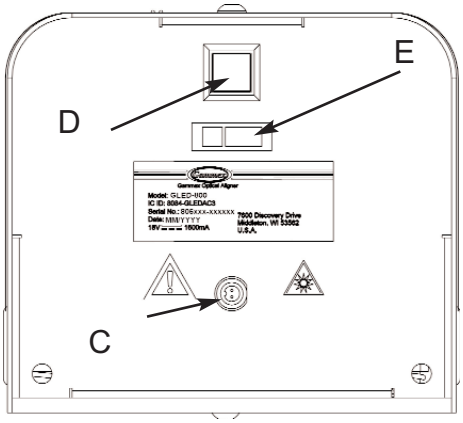
3) Back of remote control

Labels

Optical Radiation

Caution/Read Accompanying Material





Bottom View

Operator Controls

A - Cover

B - Dust cover

C - Bayonet Lock Power Plug

D - ON/OFF Power Button (Push on/push off) Lighted when on.

E - DIP Switches

• To turn the optical aligner on: push the ON/OFF button (D). The button (D) will glow green and you will see the beam of the optical aligner through the dust cover (B).

• To turn the optical aligner off: push the ON/OFF button (D). The button goes dark.

NOTE:

• Some medical facilities power all the optical aligners from one wall switch so all units in the system can be turned on and off from a convenient location.

• Some facilities connect the optical aligners to a timer so they are automatically turned off.

*Consult your local electrical codes for specific requirements.

Pre-Installation

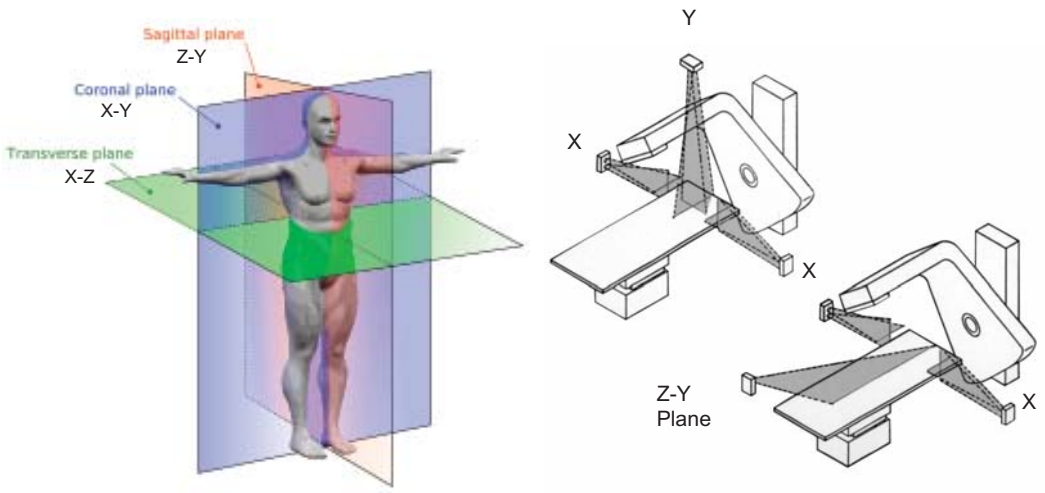
GENERAL

All Gammex *AccuChrom 3* Optical Alignment Systems provide an optical aid for rapid and accurate patient positioning and repositioning for therapy and simulator machines.

TECHNICAL DESCRIPTION

For the purpose of this manual, a single optical aligner will be referred to as a unit and a set of related aligners will be referred to as a system.

Various combinations of the GLED-800 crosshair *AccuChrom 3* and the GLED-600 sagittal (straight line) *AccuChrom 3* are used with different systems. The GLED-800 optical aligners, mounted on each side, project crosshairs along the X-axis. A GLED-800 optical aligner mounted on the ceiling projects a crosshair vertically along the Z-axis. The Sagittal GLED-600 optical aligner projects a straight line in the Z-Y plane.



Installation Requirements

ELECTRICAL

Each optical aligner is provided with a universal power supply (transformer) with an input of 100 to 240 volts AC at 50 to 60 Hz. The universal power supply plugs into a wall outlet using one of four (4) interchangeable “snap-in” plugs that fit most outlets. A 1.83 meter (6 foot) power cord supplies 18 Volt DC power to the optical aligner with a bayonet type locking power plug.

TOOLS NEEDED

In addition to some basic tools, such as screwdrivers, a hammer and a ladder; you will need an electric hammer drill, plumb bob, water level, masking tape and 15M (50 feet) of string. The mounting hardware, a 1/4-20 tap, 2 drill bits (#7 and 3/8”), 1/4” anchor and a 3/16” hex (allen) wrench, are included with the optical alignment systems. A spinning laser may be used as an alternative to a water level. Contact us for more information.

CAUTION: The location of each optical aligner is determined in relation to the therapy machine’s crosshair and isocenter. Before installing an optical alignment system, ask the physicist to verify that the field light aligns with the therapy machine’s isocenter. See Figure 1 *on page 9*.

During commissioning/validation of a linear accelerator, please power off all AccuChrom 3 positioning units (to prevent damage caused by high levels of radiation). They may be powered back on immediately after commissioning/ validation.

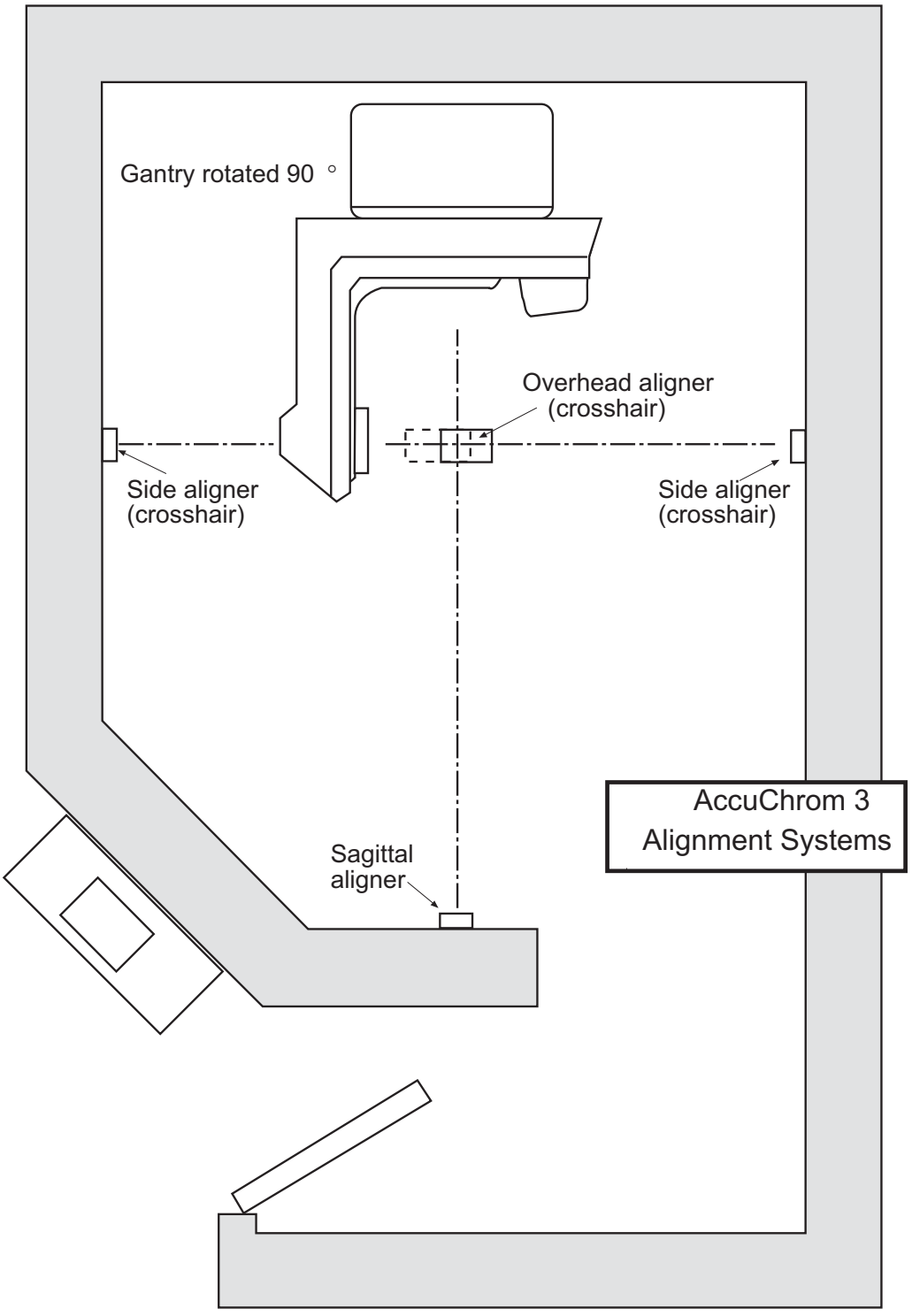


Figure 1
Room Layout

Pre-Installation

Use a water level to line up the optical aligner's exit reference point at the height of isocenter. See Figure 2 on page 10.

Preparing the Room

1. Unpack each optical alignment unit and remove shipping stability screws according to the pre-installation guide included with the unit.

2. Turn the linear accelerator lamp on.

3. Set gantry and collimator to 0º and level the collimator.

4. Lower the table as far as possible.

Collimator Crosshair Accuracy

The collimator projected crosshair is used as a reference when determining the optical aligners locations. The light field should coincide with isocenter, the gantry should be level, and if collimator crosshair displacement exists, it should be compensated for.

1. Project a collimator crosshair onto a piece of paper taped to the table and mark the center with a dot.
2. Rotate through 360° and mark the center again.
3. If there is a difference between the two dots, review this finding with site physicist. The physicist will make the final determination as to where to place the crosshair if a difference in dot location is observed.

Using the Level

Use a level to determine the height of the optical aligner exit reference point when installing optical alignment systems in a simulator room or in a room with angled walls. In standard treatment rooms, the level should also be used to verify the optical alignment system location. See Figure 2 on page 10.

1. Raise the table to the front pointer (isocenter).
2. Remove caps on ends of level and remove air bubbles.
3. Line up with the table edge and with the wall.
4. The line on the wall indicates the horizontal axis of the optical aligner exit reference point.

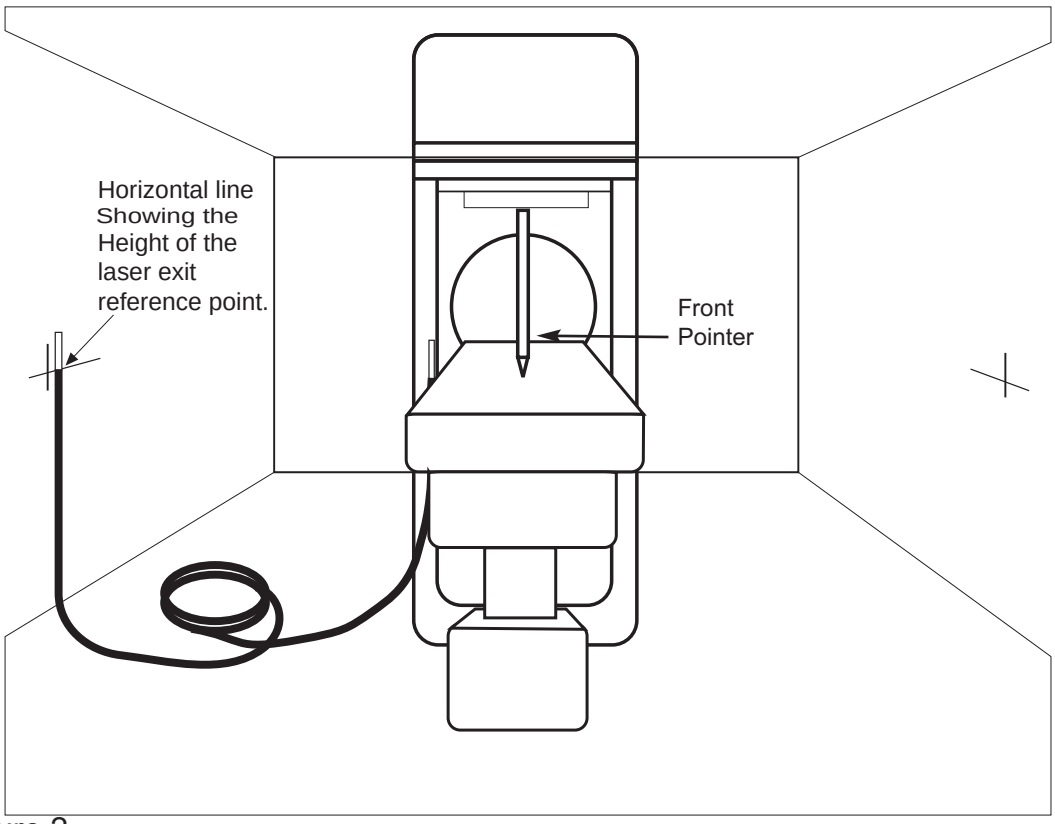


Figure 2
Use a water level to line up the alignment exit reference point at the height of isocenter.

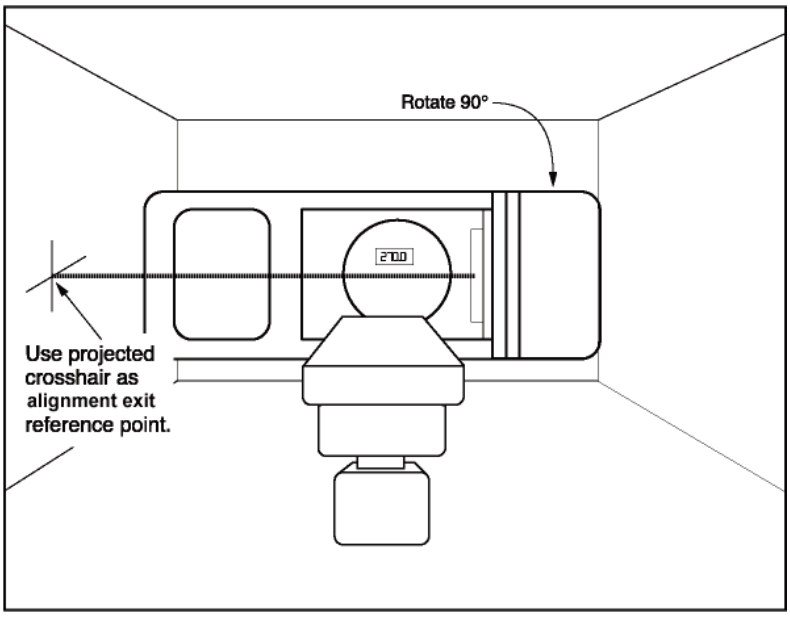


Figure 3
Rotate the gantry 90º and project a crosshair onto the wall.

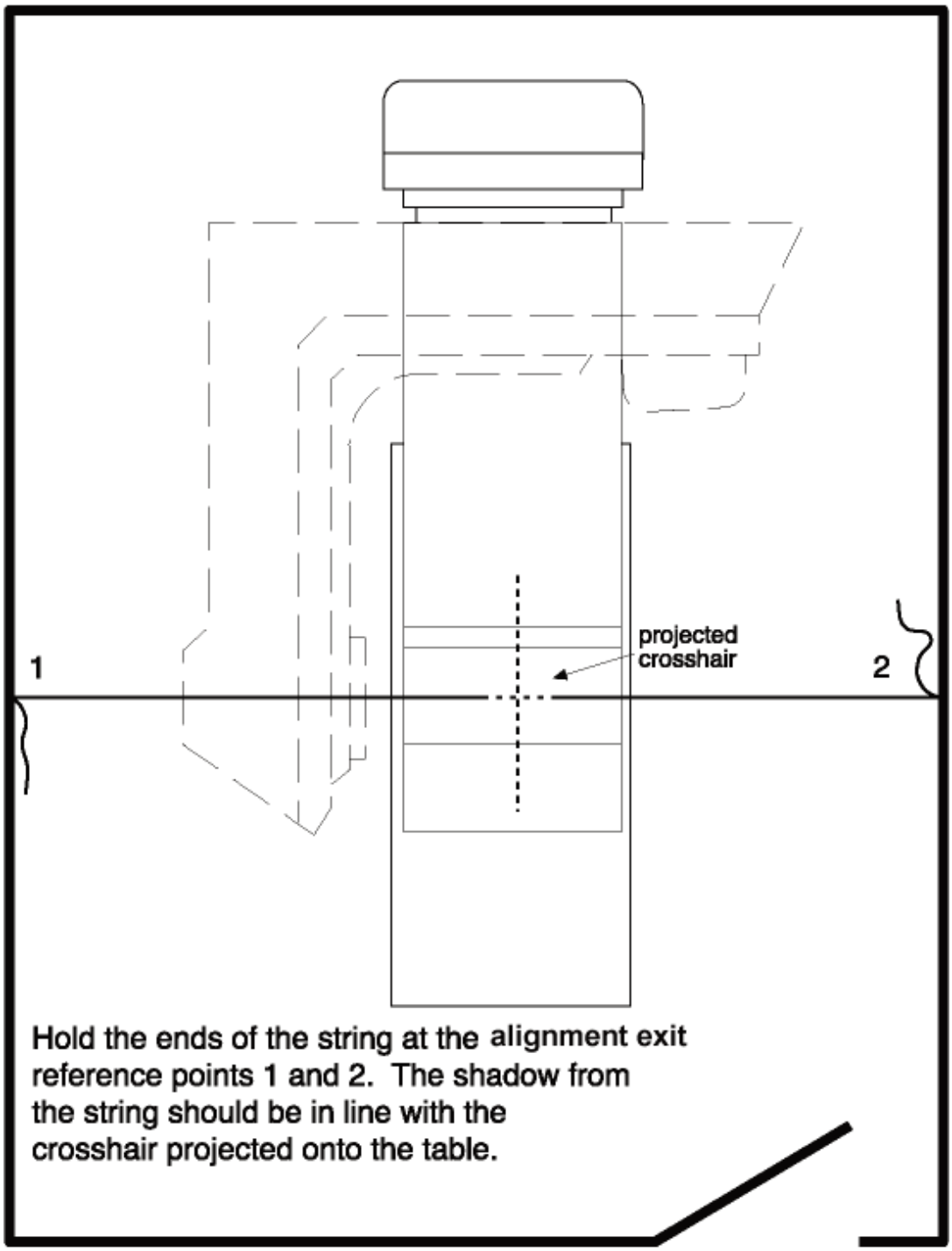


Figure 4
Use a string to verify the location of the units.

Installing Optical Alignment Systems

Side Optical Aligner Installation

For all GLED-800 installations.
For angled walls, refer to page 17.

1. Rotate the gantry 90° to the 270° position and project a crosshair onto the wall. See Figure 3 on page 11.
2. Use a pencil and straight rule to trace the crosshair onto the wall.
3. Line up the template provided, so that the projected crosshair lines up with the optical aligner exit point on the template. Use a level to line up the template.
4. Mark the outer edge of the template and also mark the mounting holes.
5. Rotate the gantry 180° to the 90° position and repeat steps 2-4 on the opposite wall.
6. Return the gantry to 0°.
7. Tape a blank 8 X 10 piece of paper to the table.
8. Project the collimator crosshair onto the paper, keep the field as wide as possible.
9. Hold the ends of a string on each wall at the center of the crosshair traced in step 2. The string shadow should be in line with projected crosshair. See Figure 4 on page 12.
10. Drill the mounting holes. Tap threads or install anchors as necessary.
11. Remove the *AccuChrom 3* from its packaging and remove shipping stability screws according to the pre-installation guide included with the unit. Remove two screws from the front cover using a 1/8” hex (allen) wrench. Slide the cover straight off towards the front.

Installing Optical Alignment Systems

SIDE OPTICAL ALIGNER INSTALLATION (continued)

12. Use the two 1/4” hex bolts and washers to mount the optical aligner to the wall shown in Figure 5. The optical aligner must be firmly mounted. Oversized holes provide flexibility to line up the exit reference hole. Suitable anchors must be used. Wall anchors for masonry are provided in the mounting kit.

    Use a 3/8” diameter drill bit for the provided anchors. It may be helpful to shift the optics to ease installation of mounting bolts. Refer to the following pages for the methods of planar adjustments. Re-center the optics after mounting.

13. Do not replace the cover at this time.
14. Plug in the universal power supply. Attach the bayonet lock power plug to the bottom of the optical alignment system. Turn on the optical aligner.
15. Plug in the receiver.
16. Rotate the gantry 90° (so that the crosshair is projected onto the optical alignment system) and tape a piece of paper to the gantry head, covering the projected light field.
17. Adjust the optical aligner so that the projected aligner crosshair lines up with the collimator cross hair. Refer to the following pages for the methods for making optical alignment system adjustments.
18. Verify that the vertical line of the projected collimator crosshair passes through the screw holes in the top and the bottom cover of the optical aligner. See Figure 5 on page 15.
19. Verify that the horizontal line of the projected collimator crosshair falls on the horizontal alignment marks of the optical aligner. See Figure 5 on page 15.
20. Adjust for perpendicular lines if necessary. Refer to page 30.
21. Turn off the optical aligner.
22. Place the cover on and replace the screws. Take care not to bump the opticals.
23. Double check the alignment of the unit several times.
24. Return the gantry to 0°.

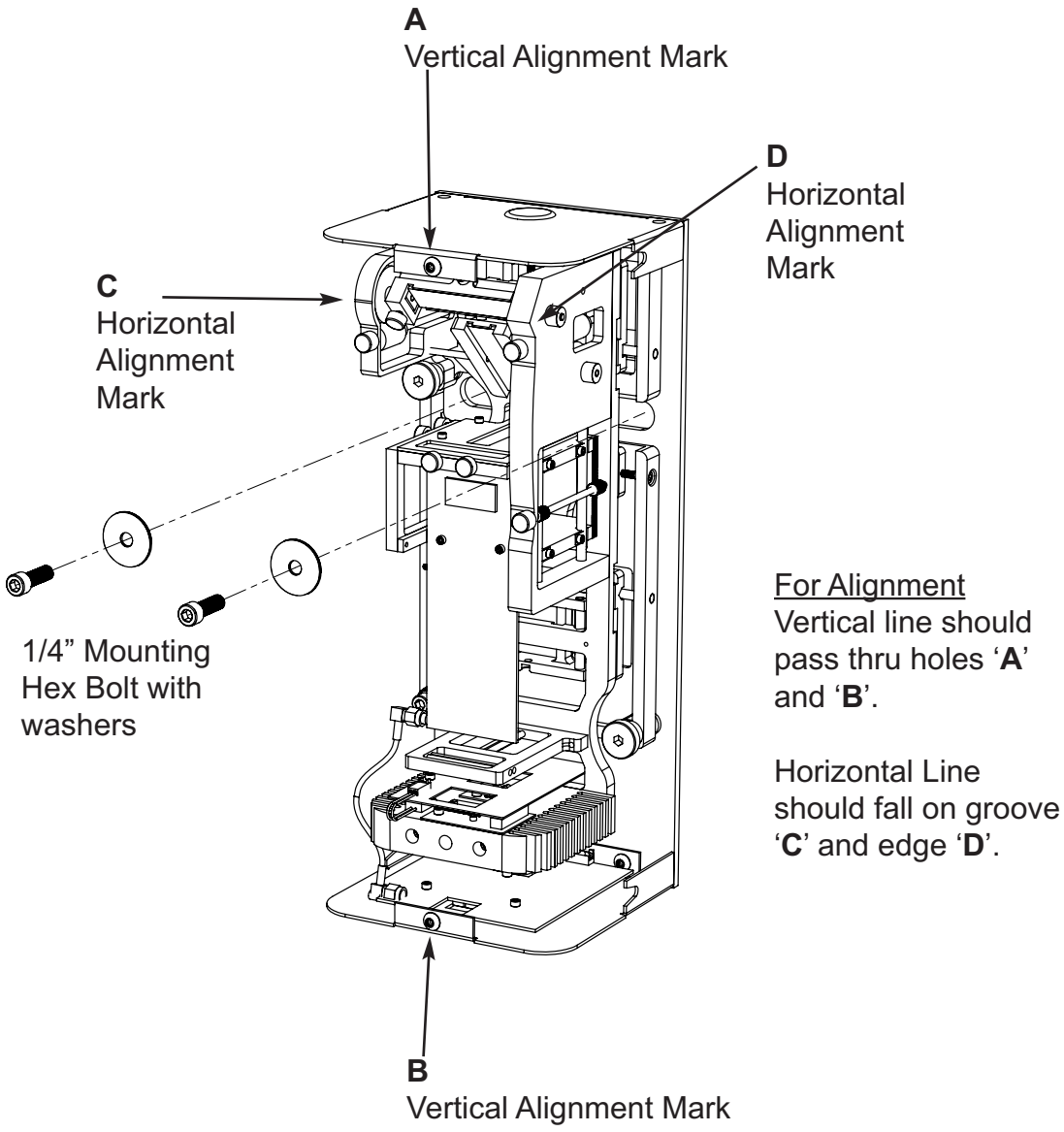

A
Vertical Alignment Mark
D
Horizontal
Alignment
Mark
C
Horizontal
Alignment
Mark
1/4” Mounting
Hex Bolt with
washers
For Alignment
Vertical line should
pass thru holes ‘A’
and ‘B’.
Horizontal Line
should fall on groove
‘C’ and edge ‘D’.
B
Vertical Alignment Mark

Figure 5

Second Side Optical Aligner Installation

1. Repeat the process used to mount the first optical aligner on the opposing wall. Using the crosshair of the first optical aligner to pencil a crosshair on this wall to determine the exit reference point and use the mounting template to identify the mounting holes.
2. Drill the mounting holes.
3. Unplug optical aligner and remove the cover.
4. Mount the unit to the wall using the 1/4 hex bolts and washers.
5. Plug in and turn on optical aligner.
6. Hold piece of paper in the path between the two aligners by looking at paper, verify:

   • optical alignment system lines overlap

   • front pointer (isocenter) lines up with the optical alignment system lines

   • vertical lines are plumb.

   • horizontal lines are level.

   • lines are sharp and focused at isocenter.

NOTE: If there is no front pointer, raise the table to isocenter and align the first optical aligner with the table edge. Align the second unit with the first.

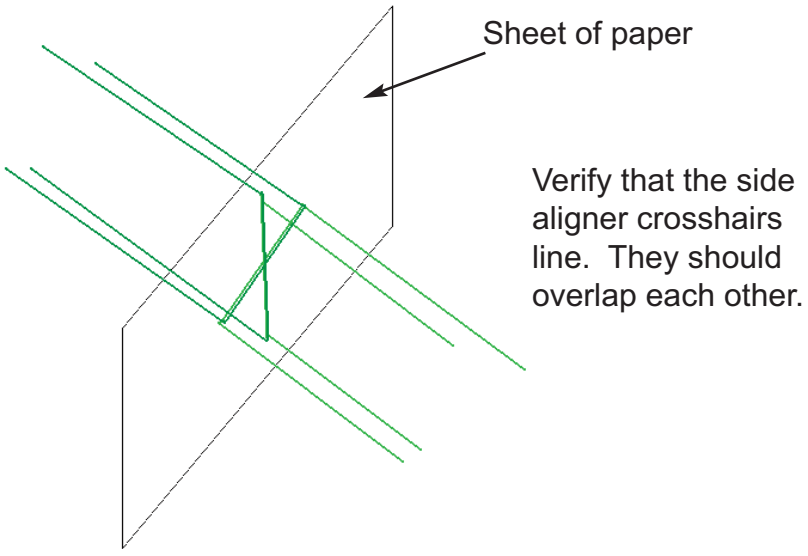


Figure 6
Use a blank sheet of paper to verify the placement of the side optical aligners.

Installation on Angled Walls

1. When mounting on angled walls, cut out and fold the angular template to the flat wall template.
2. Use a water level to determine the height of the optical aligner exit reference point. (refer to pages 10 &11)
3. Set gantry at 0°, tape a piece of paper to the table.
4. Project a crosshair onto the paper, keeping the field as wide as possible.
5. Hold the ends of a string on each wall until the string shadow is in line with the projected crosshair. Several people may be needed. See previously mentioned Figure 4.
6. On each wall use the template with its extension. Follow the directions provided with the angular template. Level the template and mark the mounting holes.
7. Drill the mounting holes. Tap threads or install anchors as necessary. Attach the angular bracket to the unit using four bolts and nuts. Leave the nuts finger tight until all course adjustments have been made. See Figure 7 below.
8. Mount the optical aligner using the angular bracket to point the unit towards isocenter.
9. Repeat the process for any remaining units on angled walls.

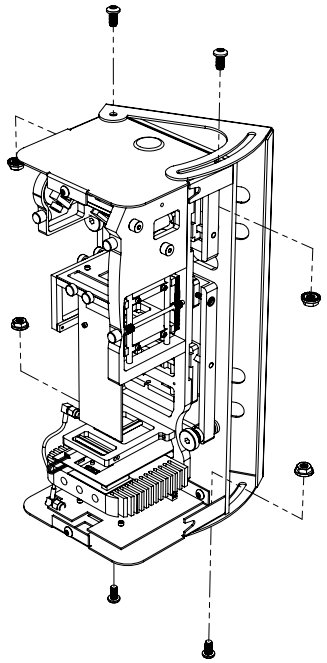


Figure 7

Ceiling Optical Aligner Installation

1. Level gantry at 0° and place the table at isocenter height.
2. Tape a piece of paper to the table.
3. Project a crosshair and mark the crosshair center point on the paper with a pencil.
4. Move collimator out of the way.
5. Hold a plumb bob from the ceiling so that the bottom weight hits the dot on the table. The point at which the string touches the ceiling indicates the optical aligner exit reference point. Mark this location with a pencil. See Figure 8.
6. Use the template to mark the location of the mounting holes.
7. Drill the mounting holes. Tap or install anchors as necessary. It is helpful to cover the table to catch drill filmings.
8. Unplug the optical aligner and remove the cover.
9. Use the two 1/4" hex mounting bolts and washers to mount the optical aligner to the wall as shown in Figure 5. The unit must be firmly mounted. Oversized holes in the aligner back mounting plate provide flexibility to line up the exit reference hole. Suitable anchors must be used. Wall anchors for masonry are provided in the mounting kit.

   Use a 3/8" diameter drill bit for the provided anchors. It may be helpful to shift the optics to ease installation of mounting bolts. See page 30 for planar adjustments. Re-center the optics after mounting.
10. Plug in and turn on optical alignment system.
11. The center of the optical alignment system crosshair should correspond with the dot on the table.
12. Raise and lower the table. The crosshair should stay aligned for the entire movement of the table. Refer to Optical Alignment Adjustments on page 31 to make corrections.

NOTE: If the aligner is mounted in a recess, cut a hole in the ceiling tile large enough to allow the entire crosshair to be projected.

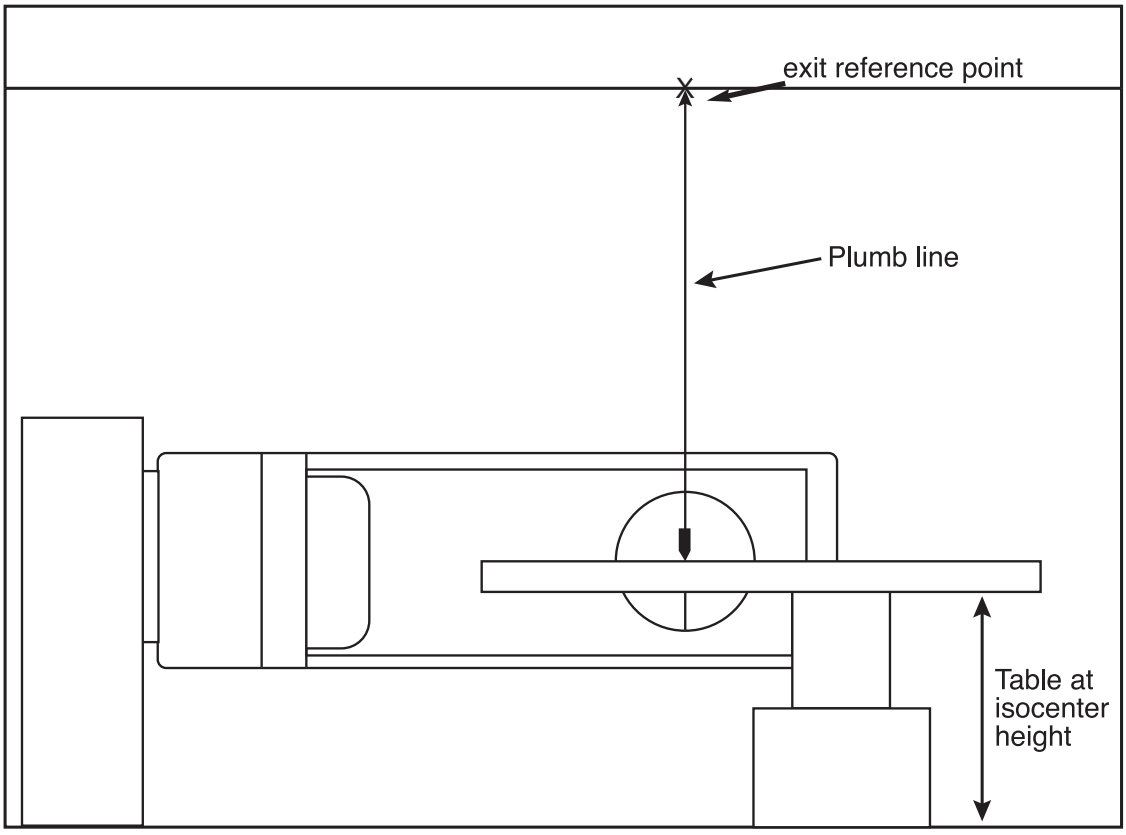


Figure 8

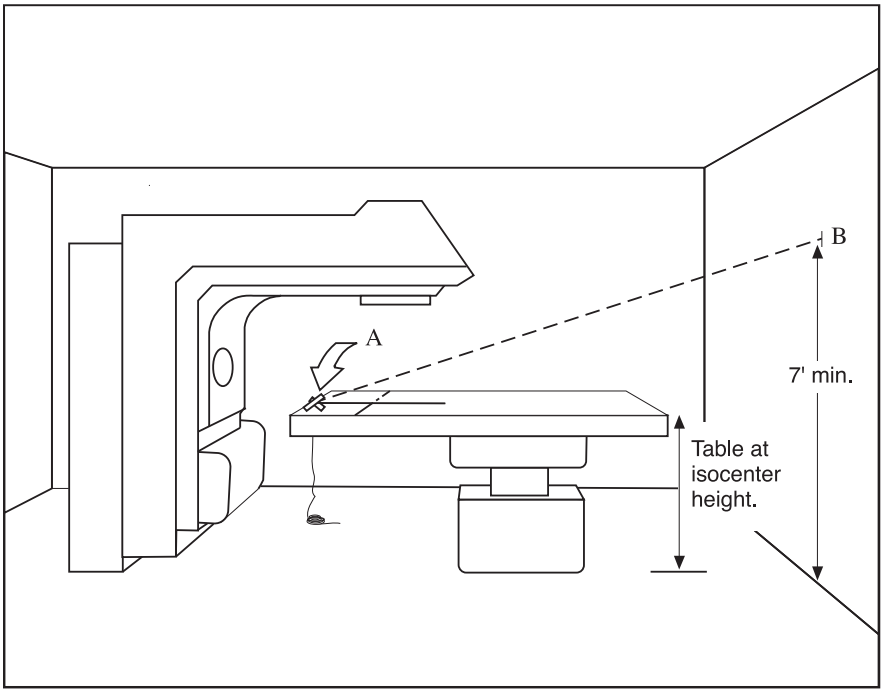


Figure 9
Use a string and the ceiling optical aligner crosshair to determine the placement of the sagittal laser.

Sagittal Optical Aligner Installation

The Sagittal Optical Aligner is mounted high on the wall. See Figure 9 room layout. The minimum install height is 7', or higher.

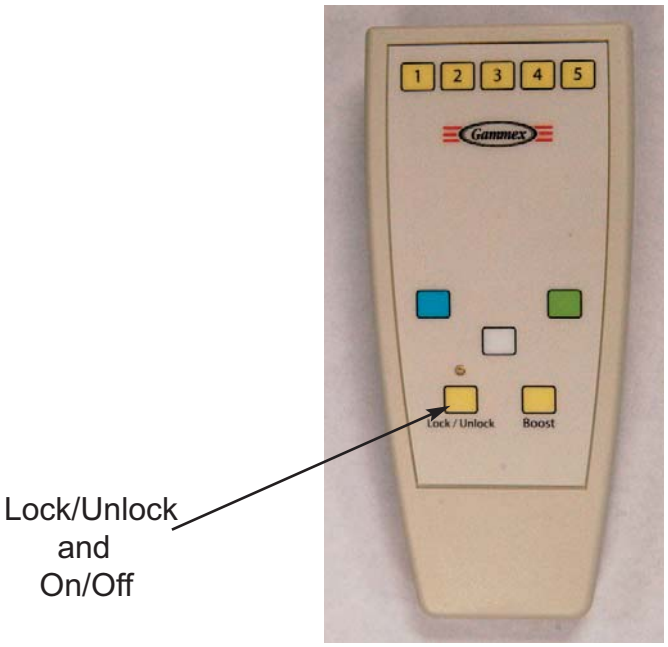
1. Set the table to isocenter height.
2. Use the crosshair from the ceiling optical aligner as a reference and tape a plumb bob string to the center of the table so that the string line aligns with the crosshair. Point A in Figure 9.

   If your system does not contain a ceiling unit, use the collimator-projected crosshair. Be sure to check for collimator accuracy. Refer to page 10.
3. Move the table up and down to verify tracking of the string line. The projected sagittal line should cover or, overlay the line formed by the string.
4. The point at which the string hits the wall indicates the center of the vertical optical aligner exit reference point. Point B in Figure 9.
5. Use the template to determine the location of the mounting holes.
6. Drill the mounting holes. Tap or install anchors as necessary.
7. Unplug the optical aligner and remove the cover.
8. Use the two 1/4” allen bolts and washers to mount the optical alignment system to the wall as shown in Figure 5. The unit must be firmly mounted. Oversized holes in the aligner back mounting plate provide flexibility to line up the exit reference hole. Suitable anchors must be used. Wall anchors for masonry are provided in the mounting kit.

   Use a 3/8” diameter drill bit for the provided anchors. It may be helpful to shift the optics to ease installation of mounting bolts. See later pages for planar adjustments. Re-center the optics after mounting.
9. Plug in and turn on optical aligner.
10. Verify that the optical alignment line tracks the crosshair projected onto the table.

Remote Control

Remote control is a radio communication feature that allows the operator to change color and boost brightness with a hand-held remote transmitter. Each optical alignment system has a separate receiver that responds to the operator's remote control. The remote control and optical alignment system both have an ID switch. The ID switch sets the identification number for the system. This allows different rooms to operate remote control optical alignment systems in close proximity without interference. All remote control receivers in a room will have the same ID number. Different rooms will have different remote ID numbers. To communicate properly, the remote control ID must be set to match the optical alignment system IDs of all of the optical alignment system receivers in a system. To turn remote on press the lock/unlock button. Green light will illuminate.

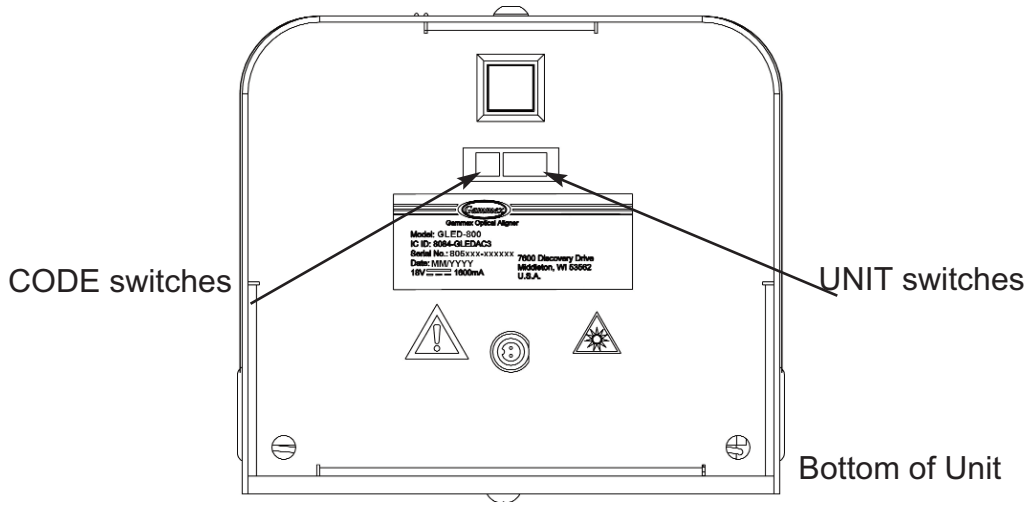


Unit and Code settings: (quick start)

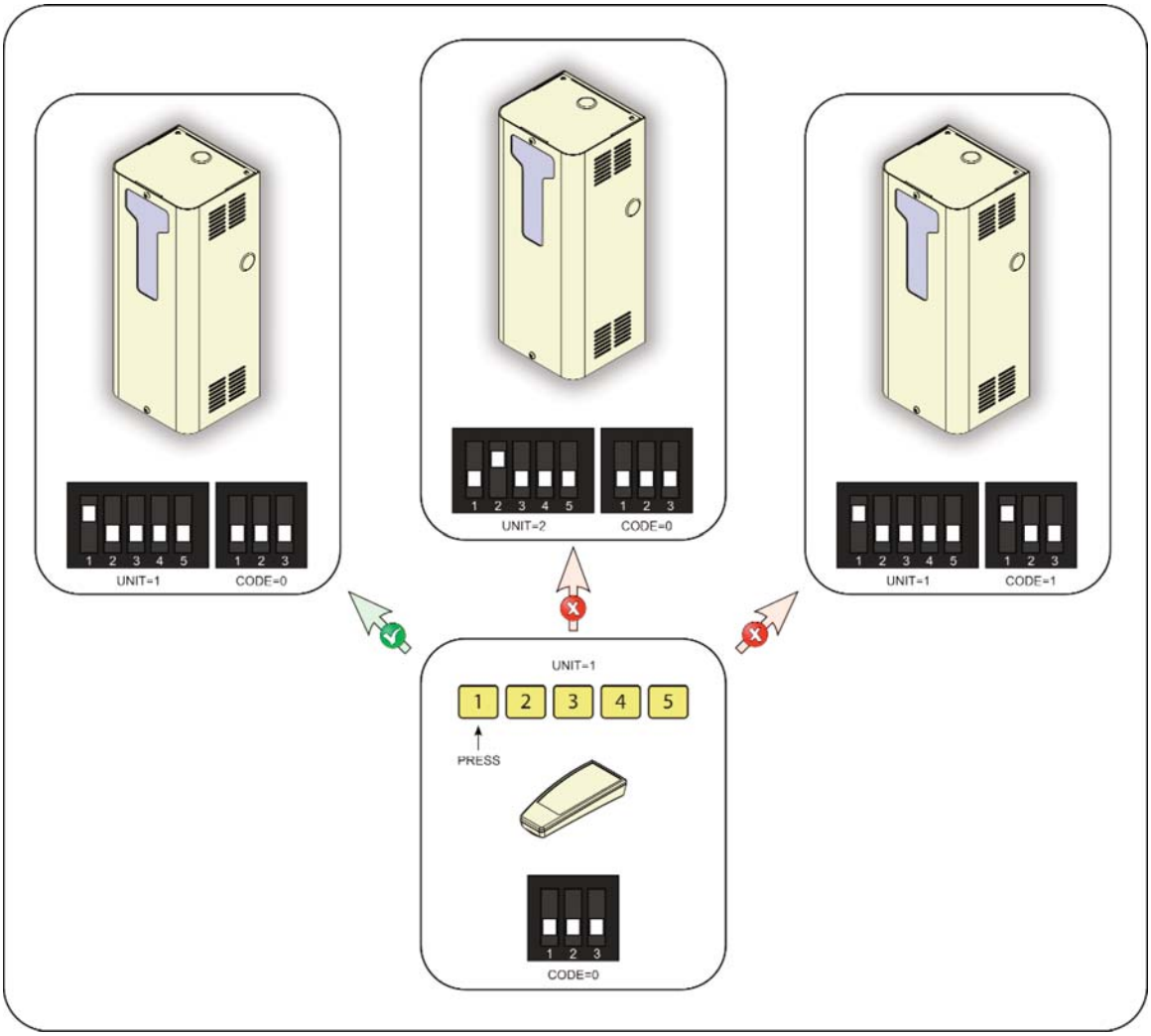
A single remote control transmitter may be used to operate one or more AccuChrom 3 positioners. Dual Inline Package (DIP) switches are used to prevent unwanted interference between adjacent systems.

Use the UNIT switches to determine which AccuChrom 3 positioners will respond to which yellow UNIT button on the remote. It is possible to have some units respond after pressing button 1 and others after button 2 (and so on).

Keep the CODE switches on all AccuChrom 3 aligners and the remote control that will be used to command them at the factory default (0) setting unless you experience interference.

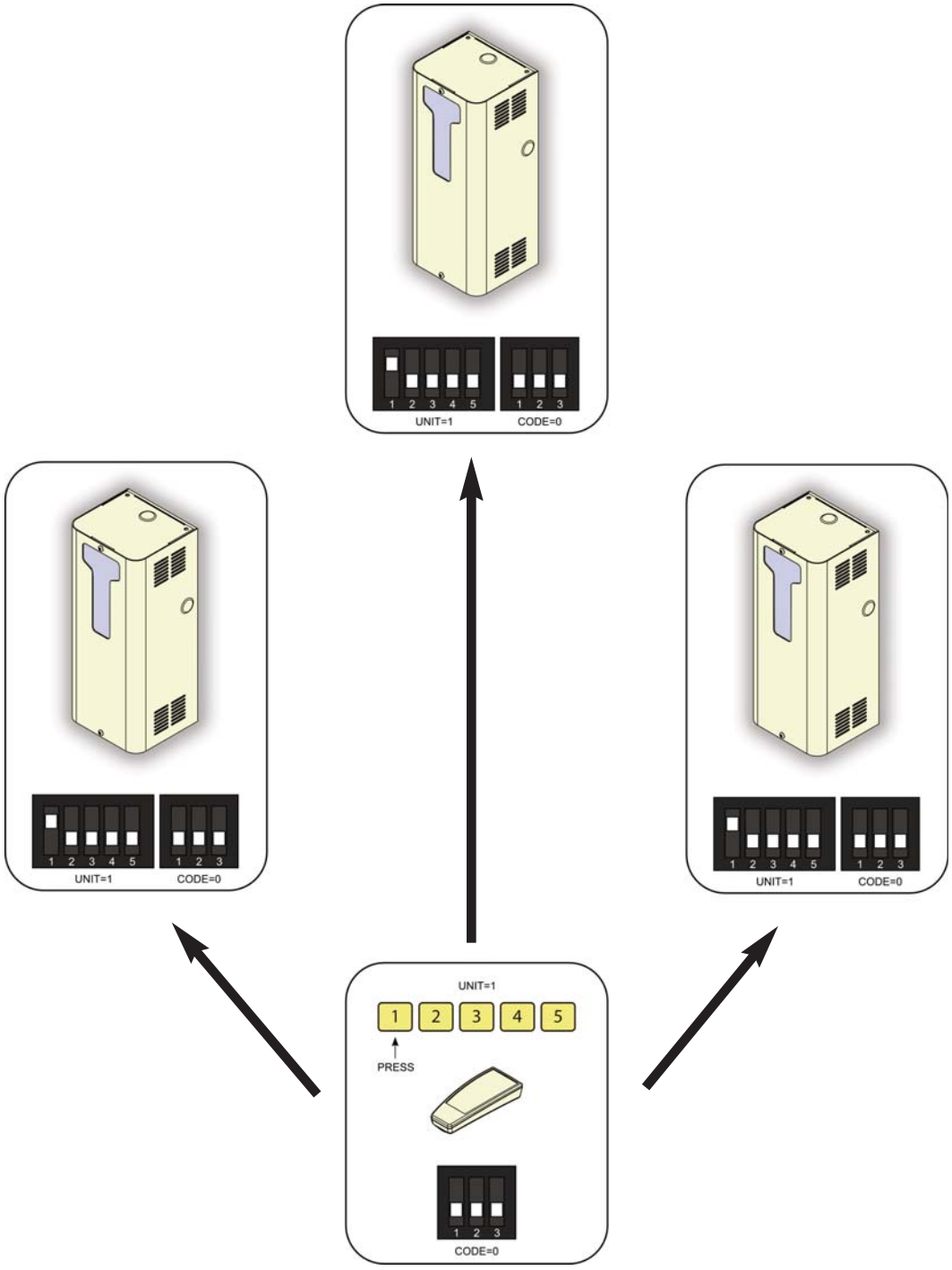


The following illustration shows the settings which result in successful and unsuccessful communication. Use the available switch combinations to configure systems as desired. For more details about Unit and Code settings, continue to the next pages.

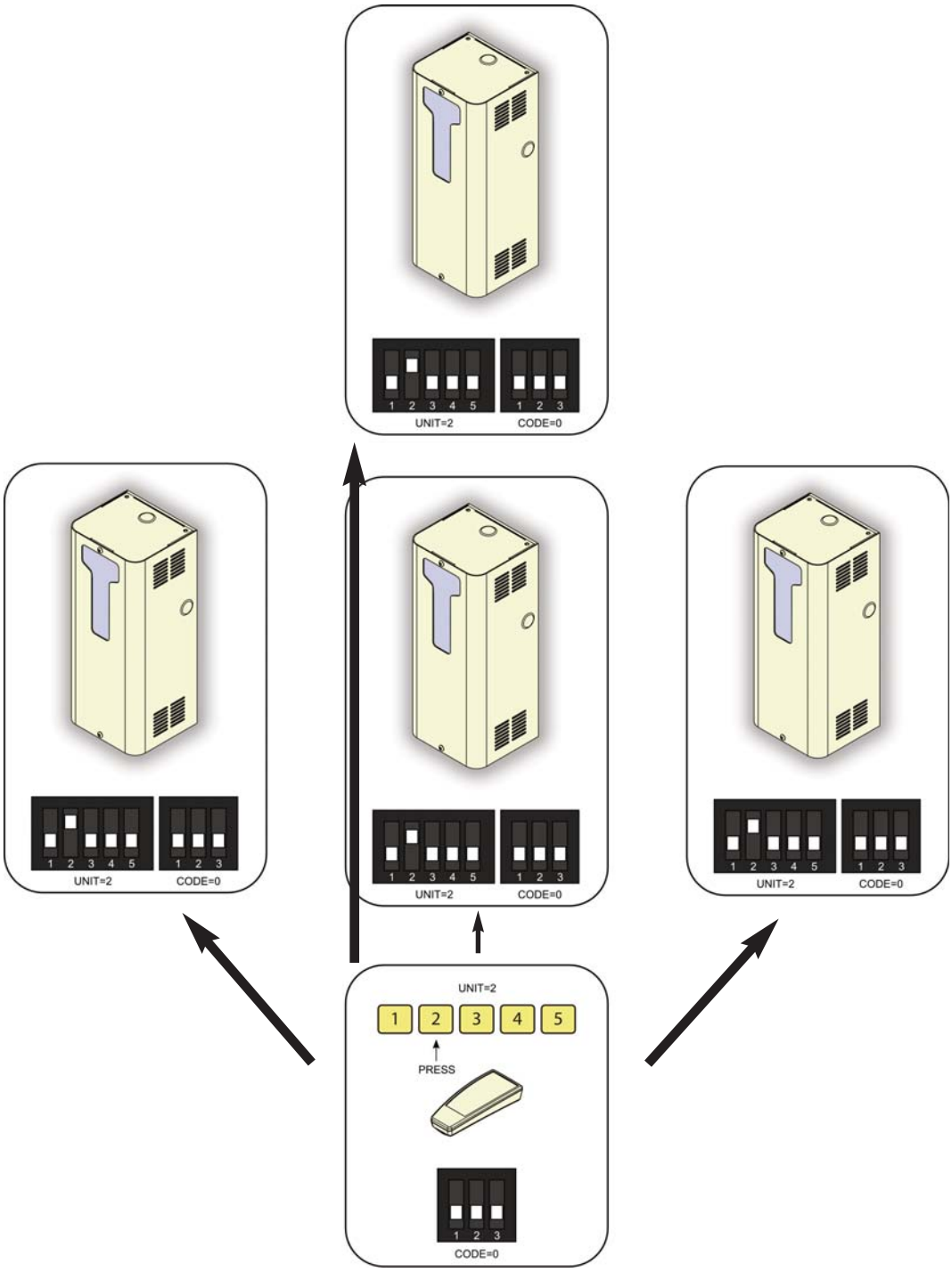


Typical system configurations

Typical configuration: three optical aligner units controlled by one remote control transmitter; Unit = 1 Code =0



Typical configuration: four optical aligner units controlled by one remote control transmitter; Unit = 2 Code = 0



Unit and Code settings

Your new optical aligner has been factory set to a default configuration enabling testing during manufacture.

The installer and/or end user shall set the parameters based on the desired customer configuration at the installation site.

Unit

By use of the Unit switch, a system is configured to either include (within the system) or exclude (from the system) optical aligner(s) to be commanded by that remote control transmitter.

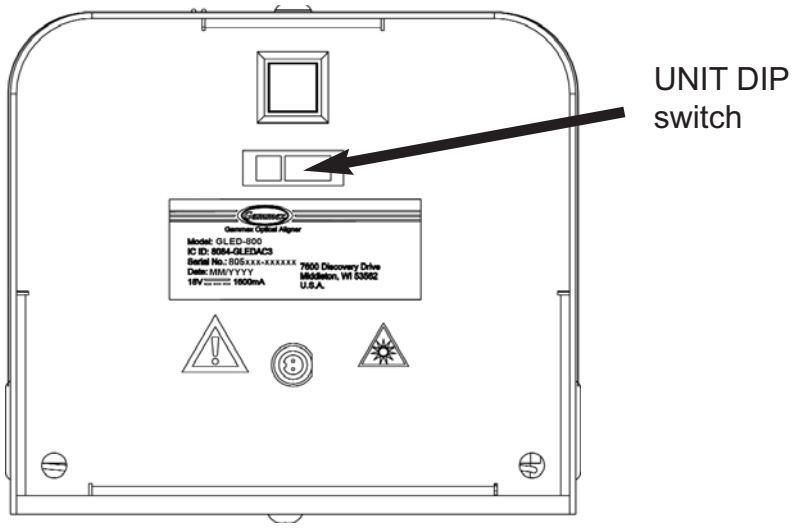
A “one-to-one” or a “one-to-many” command and control structure (association) can be configured through use of the Unit switch. The Unit selection of a remote control transmitter must match the 5-position UNIT DIP switch setting of optical aligner(s) to be commanded by that remote control transmitter.

The ***factory-set default value is Unit 1**. AccuChrom 3 positioner Unit values may be configured according to this table.

AccuChrom 3 positioner 5-position unit DIP switch	switch 1	switch 2	switch 3	switch 4	switch 5
Unit 1*	**On (1)**	**Off (0)**	**Off (0)**	**Off (0)**	**Off (0)**
Unit 2	Off (0)	On (1)	Off (0)	Off (0)	Off (0)
Unit 3	Off (0)	Off (0)	On (1)	Off (0)	Off (0)
Unit 4	Off (0)	Off (0)	Off (0)	On (1)	Off (0)
Unit 5	Off (0)	Off (0)	Off (0)	Off (0)	On (1)

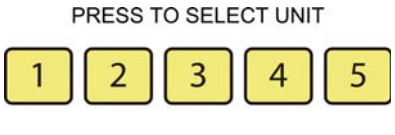
How to select optical aligner Unit setting

The Unit is configured through the 5-position DIP switch located on the bottom of the optical aligner as illustrated below.



How to select Remote Control Transmitter Unit setting

The Unit setting is user-selected by pressing the correct push-button along top row of the remote control transmitter as illustrated below after the remote control is on (green LED above Lock/Unlock button illuminated). Once the user selects a Unit number (with green Lock/Unlock LED illuminated), this Unit number is retained until a different Unit button is pressed.



Code

The factory default Code value should work in most applications; the installer/user should not need to change the Code setting. Only if interference from other 433.92 MHz remote control devices is present, would this Code value be changed.

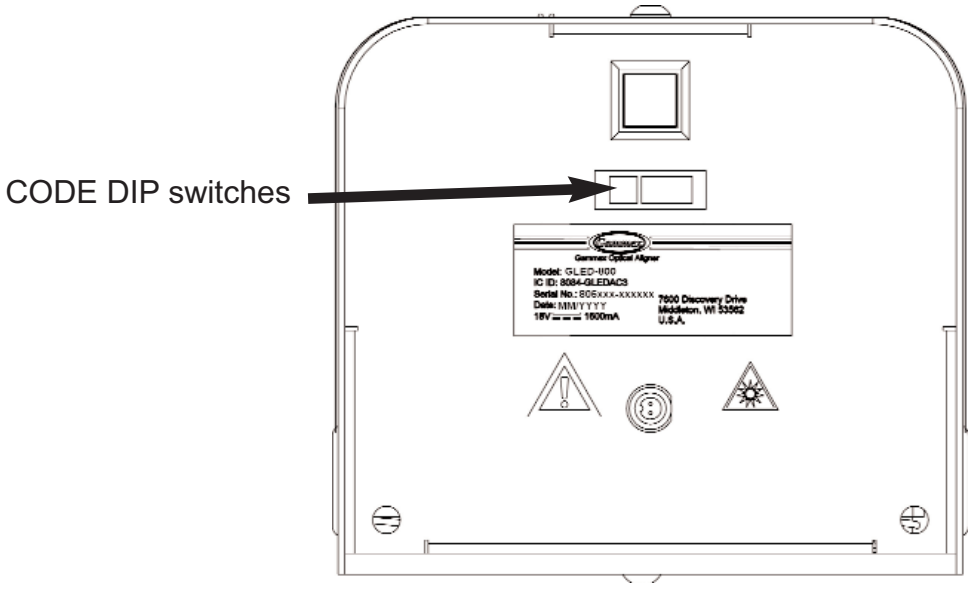
Wireless encryption (tunnel) is used between remote control transmitter and optical aligners to prevent/mitigate interference from other devices sharing the 433.92 MHz frequency. The optical aligner is capable of operation using any of eight distinct encryption (coding) scheme combinations selected by the three-position CODE DIP switches.

In order for any remote control transmitter to work with any optical aligner(s), the ON/OFF position on the three internal DIP switches the remote control transmitter and the externally accessible optical aligner (3-position Code DIP switch) must precisely match. Note the ***default factory-set value is encryption code 0**. However, other values may be used to mitigate interference.

Remote Control transmitter or optical aligner Code (3-position DIP switch)	switch 1	switch 2	switch 3
encryption code 0*	**Off (0)**	**Off (0)**	**Off (0)**
encryption code 1	On (1)	Off (0)	Off (0)
encryption code 2	Off (0)	On (1)	Off (0)
encryption code 3	On (1)	On (1)	Off (0)
encryption code 4	Off (0)	Off (0)	On (1)
encryption code 5	On (1)	Off (0)	On (1)
encryption code 6	Off (0)	On (1)	On (1)
encryption code 7	On (1)	On (1)	On (1)

How to select optical aligner Code setting

The Code is configured through three position DIP switches located on the bottom of the optical aligner as illustrated below.



How to change Remote Control Transmitter Code setting

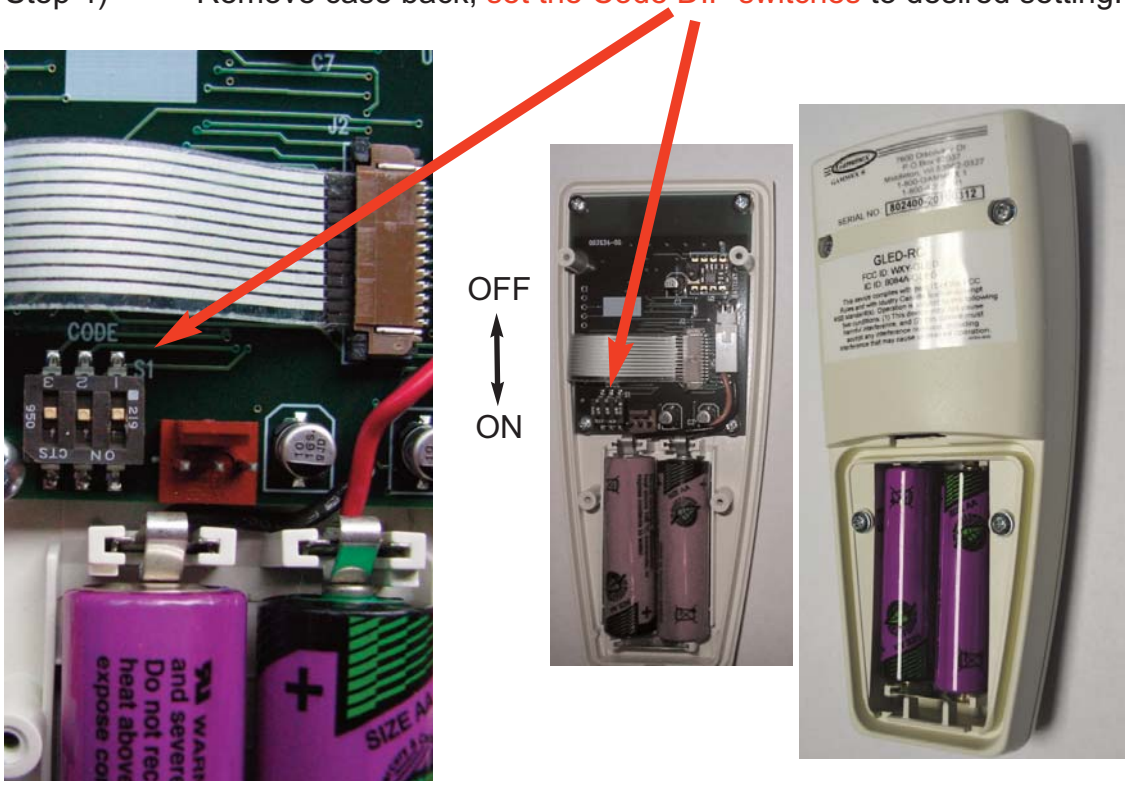
The remote control CODE setting is determined by the position of the three (3) position DIP switches inside the remote control transmitter. The default setting (Code 0) should work. However if you must change it, follow these instructions to change the CODE DIP switches inside the remote control transmitter.

Step 1) Set remote control unit on table face-down with back facing up.

Step 2) Remove the battery compartment cover.

Step 3) Remove four screws on the back of the case (two within battery compartment).

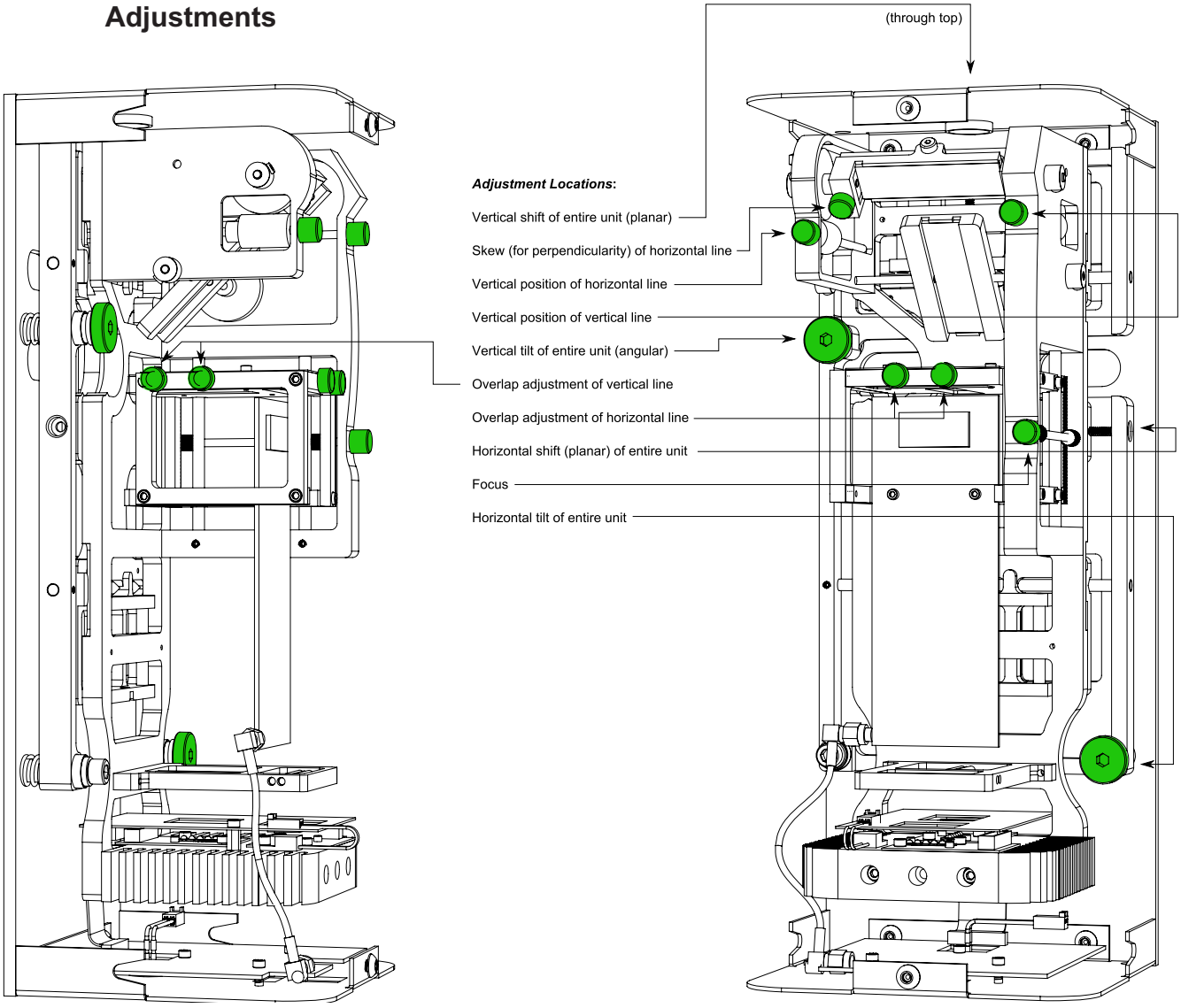
Step 4) Remove case back; set the Code DIP switches to desired setting.

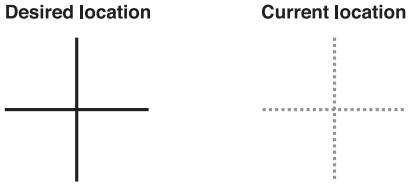


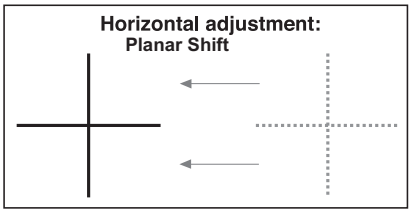
Note: The switch is off (0) when pushed up or away from batteries toward the word “CODE” on circuit board.

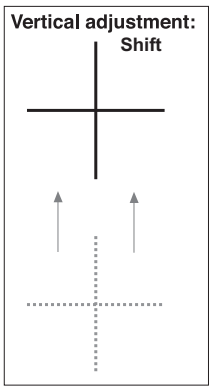
Step 5) Reassemble remote control transmitter reversing the above steps.

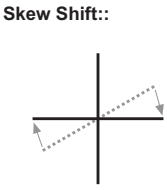
Adjustments











Alignment and Adjustments and Positioning– *AccuChrom 3*

Warning - Risk of incorrect (diagnosis or treatment) if alignment is not done correctly.

- Isocenter of alignment optical alignment systems must coincide with isocenter of diagnostic of treatment equipment. Test alignment of optical aligner daily, before use, for first month of operation and weekly after first month. Newly installed equipment will shift as building walls and floor settle and as building materials dry out. Re-align optical alignment system to isocenter before use, if anything has shifted.
- The optical alignment system must be aligned with the diagnostic or therapy equipment to be safely useful. Only a GAMMEX service technician, or trained Medical Physicist, Biotech Engineer or Service Technician should perform the alignment.

Caution - Optical Radiation Risk of eye damage. Do not stare directly at the light source.

- Alignment procedures need to be performed with the optical alignment system powered on.
- Look only at optical alignment system light reflected from a diffuse surface (like paper or a wall).

See Typical Room Layout (page 9) for general concept of optical alignment system set-up.

Removing the Cover

On the *AccuChrom 3,* most adjustments and repairs require the removal of the front cover. Remove the cover as follows: First, turn off the unit. Unplug the power cord from the main socket. Remove two screws from the front cover using an 1/8” allen wrench. Slide the cover off.

Plug in the power cord and turn on the unit to make adjustments.

To replace the cover after making adjustments, reverse the process. Turn off the optical aligner. Unplug the power cord. Replace the front cover and secure it with the two screws.

Take care not to jar the optical aligner.

Plug in the power cord.

Alignment and Adjustments – *AccuChrom 3*

General

Test the alignment of the optical alignment systems daily, before use, for the first month after installation. In a new installation some building movements can be expected. The first month test the system at least weekly. Isocenter of the alignment optical alignment system must coincide with the isocenter of the diagnostic or treatment equipment.

Ceiling and Sagittal optical aligners

Tape a piece of typing paper to the table under the gantry. That has been leveled and set at 0°. Project a crosshair on the paper from the gantry. Mark the center point. Move the gantry out of the way. Project the Ceiling optical aligner crosshair on the paper. Raise and lower the table. The center of the crosshair should align with the dot on the paper at all times. The Sagittal line should pass through the dot on the paper at all times.

Side optical aligners

Turn on both side optical aligners. Use a piece of typing paper held perpendicular to the optical aligner light. The two projected optical aligner crosshairs should overlap on the paper. See Figure 6 on page 16.

With the gantry at 0° use a front pointer, which is shown in Figure 2, to verify that both side optical aligners hit isocenter. If there is not a front pointer, raise the table to isocenter and project a crosshair on the table to verify that the side optical aligners hit isocenter.

Maintenance/Cleaning

Once installed, the Gammex Aligners should require no maintenance other than the cleaning of mirrors and lenses according to standard optical practices. Occasional outside wiping of the dust cover may be necessary. The dust cover is delicate. Use only a camera lens brush or other soft brushes for this purpose.

Troubleshooting

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
NO OPTICAL ALIGNMENT LIGHT	Wall switch not on.	Check switch by turning optical aligner off and on.
	Wall switch not in full on position.	Verify switch lever is in the full on position
	Plug/connector not plugged in. Plug partially plugged in.	Verify plug is in the fully plugged in position.
	Power supply not functioning.	Use a voltmeter to measure the voltage output of power supply wall plug. If voltage is less than 18 or greater than 23 VDC, the power supply will need to be replaced. Call Gammex Sales and Service for assistance.
INTERMITTENT OPTICAL ALIGNMENT LIGHT		Use a voltmeter to measure the voltage output of power supply wall plug. If voltage is less than 18 or greater than 23 VDC, the power supply will need to be replaced. Call Gammex Sales and Service for assistance.

Gammex uses optical alignment systems that are matched for chromacity. The company strives to match unit-to-unit consistency as closely as possible. Over time, chromacity may change slightly so that optical aligners purchased at different times may display slight color variations. If you have questions on this, please contact the Gammex Service Department.

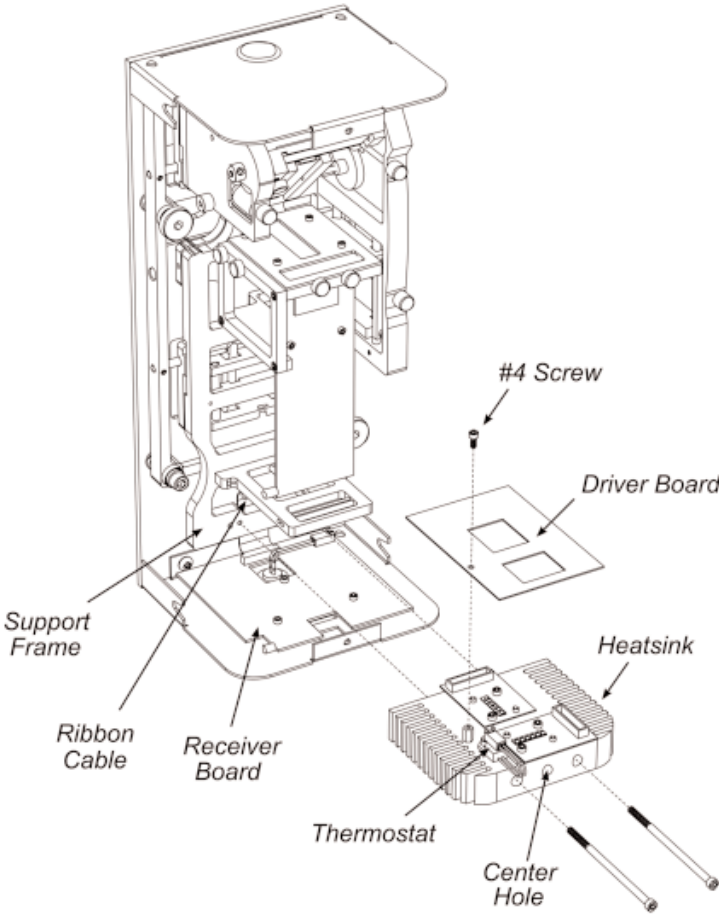
PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
MAIN UNIT DOES NOT RESPOND TO COMMANDS FROM REMOTE CONTROL TRANSMITTER	Remote Control Transmitter is off.	Turn on (unlock) the remote control transmitter by pressing lock/unlock switch until “on LED” is illuminated.
	Dead batteries in remote control transmitter.	Replace batteries (page 36 of this manual) and (parts list table page 37)
	The “Unit” setting is mis-matched.	Verify/set positioner unit value setting (page 25 of this manual) and then power on positioner unit and remote control. Select same “unit” on the remote control transmitter (page 26 How to Select Remote Control Transmitter unit setting) as is set on main unit DIP switches.
	Mis-matched “Code” setting.	Verify/set positioner Code Value Setting (page 27-28 How to Set Optical Aligner Code Setting) and then verify remote control value (page 29 How to Change Remote Control Transmitter Code Setting) to match the positioner code value. Power on positioner and remote control transmitter

AccuChrom 3 LED Replacement Kit Instructions

The following directions outline the procedure for replacing the heat sink module. Read and familiarize yourself with all of the steps before beginning.

Tools Required: 3/32,7/64, and 1/8" allen wrenches

1. Turn off and unplug the unit from the power source.
2. Remove the two screws holding the front cover on using the 1/8" allen wrench. Slide the cover off and set it aside.
3. Loosen and remove the two 3" long screws fastening the heatsink module to the support frame of the unit.
4. Two small dowel pins help align the heatsink in the proper location on the support frame. The tight tolerances on these parts makes for a tight fit. The center hole in the heatsink has been provided to help with removal. Thread one of the long screws back into the center hole and it will help separate the heatsink from the support frame. There will be some resistance due to friction of the dowel pins.
5. Once the heatsink has been separated from the support frame withdraw it as far as the ribbon cable will allow. Unplug the ribbon cable from the underside of the driver board and fully remove the heatsink. Remove the long screw from the center hole and set it with the other one. **Do not lose either of these screws.**
6. Remove the single #4 screw fastening the driver board to the heatsink. **Do not lose this screw.**
7. Unplug the thermostat from the front edge of the driver board.
8. Gently separate the driver board from the heatsink. Carefully grasp it by the edges and lift it upwards.
9. Transfer the driver board to the new heatsink module provided with the replacement kit. Connect the new thermostat and replace the #4 screw.
10. Bring the new heat sink assembly close enough to reconnect the ribbon cable. Make sure the ribbon cable's connector fits over all of the pins on the driver board and is fully engaged.
11. Align the heat sink to the support frame and secure it with the two long screws. Alternate between tightening both screws to bring the components together evenly.
12. Check the alignment of the unit. Small corrections may need to be made because the internal components have been handled.



Note: *Electronic components are sensitive to static electricity. Use standard ESD precautions when performing the replacement procedure.*

REPLACING THE TRANSMITTER BATTERIES

The transmitter has a battery compartment on the back that can be opened by pushing down on the catch and sliding it toward the end of the case. The cover may be tight. It may be necessary to very carefully pry the opening apart at the parting line.

It is very important to replace the batteries with the proper polarity in the right direction as shown. The spring contact always matches the negative (-) end. These batteries are not rechargeable. **Do not recharge them**. They are long life lithium AA, 3.6V, 2.4Ah batteries. Transmitter batteries will not often require replacement, but when they do, they are available from Gammex Sales Department. The transmitter will not function using commonly available AA batteries, they are not the correct voltage.

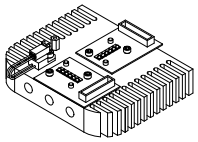
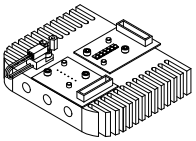
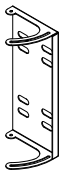
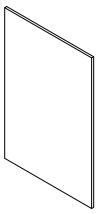
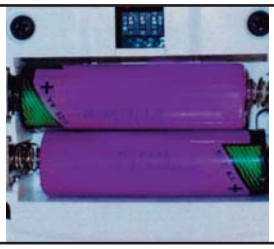
DISMANTLING

The *AccuChrom 3* can be removed from the wall by following the reverse of the installation instructions.

DISPOSAL

The *AccuChrom 3* contains steel, aluminum, lead, brass, lead-free paint and plastic. Recycle according to your applicable laws.

Parts List

Part Number	Description	
805333	LED Replacement Kit Crosshair Optical Alignment System	
805334	LED Replacement Kit Sagittal Optical Alignment System	
602463	Angular Mounting Kit	
007725	Power Supply 18VDC Universal Medical Grade Power Supply plugs Set of 4	
007726	Replacement dust cover	
007575	Lithium AA Battery 3.6V, 2.4Ah	

NOTE: Installation Template was shipped with your patient positioning unit. For replacement template, please use Gammex part number: 007882

Specifications

Output

Range ~ 2.6 - 3.0 meters
Line Width ~ 1 mm
Beam (Line) Divergence ~ 70cm vertical and horizontal at 3m range
Drift ~ < or = ±1mm
Wavelength~ Green = 535-550 nm Cyan = 490-505 nm White Neutral color temp= 3950 K
Visibility/Intensity ~ line visible in strong ambient light environment

Adjustment
Horizontal Range of Vertical Projection ~ ± 45º from center
Vertical Range of Horizontal Projection ~
Crosshair ± 5º from center ~ Sagittal +5º/- 45º from center
Line angle adjustment range ~ ±2.5º from center

Optical Patient Alignment Dimensions
Length - 34.3cm (13.5 inches)
Width - 14 cm (5.6 inches)
Depth - 12.7 cm (5 inches)
Weight - 4.1 kg (9 pounds)

Universal Power Supply includes adapters for US and international use
Power Requirements 100 vac (0.25A) to 240 vac, 50-60 Hz

Environmental Conditions
Operating Temperature +5 to +35ºC (+41 to +95ºF)
Storage Temperature -20 to +40ºC (-4 to +104ºF)
Operating Humidity 0 to 85% relative humidity (no dew or condensation)
Storing Humidity 0 to 85% relative humidity (no dew or condensation)

Compliance Information
CE marked.
Power supply UL, cUL, GS and CE marked.

Transmitter: FCC ID: WXY-GLED
IC ID: 8084A-GLED
Receiver: IC ID: 8084A-GLEDAC3

This device complies with part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept and interference received, including interference that may cause undesired operation.

WARNING: No modifications may be made to the remote control without expressed written consent of Gammex Inc. Making unauthorized changes will void authority to use this equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and Canadian ICES-003. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different fro that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Technical Support

Technical support is available from Gammex Service Representatives who are available to work with facility planners, architects and hospital personnel throughout the planning and installation process.

Contact the Gammex Service department at 1-800-232-9699 or 608-828-7000.

Product Warranty

Gammex Inc. warrants its patient positioning equipment to be free from defects in materials and workmanship under normal use and service for 1 year from the date of shipment. The sole obligation of Gammex Inc. under this warranty is to repair or replace without charge or to refund the purchase price, at the option of Gammex Inc., of any parts which its examination shall have disclosed to be defective, provided that Buyer shall have given to Gammex Inc., a written notice of the claimed defect no later than 7 days after the end of the warranty period (one (1) year of the date of shipment of such equipment to Buyer). At the request of Gammex Inc., Buyer, at its expense, shall return the claimed defective part to Gammex Inc.

DISCLAIMER OF OTHER WARRANTIES

The aforesaid warranty rights are buyer's exclusive remedies and are in lieu of any other remedies, obligations, or rights, including, without limitation, any other warranties, expressed or implied (e.g., implied warranties of merchantability or fitness for a particular purpose). Under no circumstances shall Gammex Inc. be liable for any incidental, indirect, special or consequential damages or for any other loss, damage, penalty or expense of any kind, including, without limitation, loss of profits or overhead, reimbursement, personal injury or property damage. The aforesaid warranty obligation of Gammex Inc. constitutes its sole liability, and under no circumstances, shall the maximum liability of Gammex Inc., under any legal theory(e.g., contract, warranty, negligence, promissory estoppel, strict liability, misrepresentation, tort) and for any reason whatsoever(e.g., defect, delay or otherwise) exceed the purchase price of the defective part regardless whether the claim is asserted by buyer or any other person or entity. The liabilities of Gammex Inc. as above set forth, shall not be extended because of advice given by it in connection with the design, installation or use of the equipment or parts therefore.

Your warranty may be registered at http://www.gammex.com/warranty.asp

Sales and Service

GAMMEX is committed to satisfying our customers' needs. If you have any questions, comments, or suggestions regarding our products and service, please call or fax us. Please contact a GAMMEX dealer or representative for a quotation or for a detailed description of our ordering policies, warranties, delivery policy, conditions of sales, damaged goods policy, and returned goods policy.

Sales Department hours are Monday through Friday, 7:30 am to 5:00 pm, Central Time.

1-800-GAMMEX-1 (426-6391)
1-608-828-7000
1-608-828-7500 Fax
e-mail: sales@gammex.com

Service Department hours are Monday through Friday, 7:30 am to 5:00 pm, Central Time.

1-800-232-9699
1-608-828-7000
1-608-828-7500 Fax
e-mail: support@gammex.com

GAMMEX
7600 Discovery Dr
P.O. Box 620327
Middleton, WI 53562-0327 U.S.A.

http://www.gammex.com

VISA, MasterCard and American Express accepted.

GAMMEX LASERS®

All products and specifications are subject to change without notice.

Printed in U.S.A. 007890-00-00

Gammex, Inc.
P.O. Box 620327
Middleton, WI 53562-0327 USA
1 800 GAMMEX 1 (426-6391)
1 608 828 7000
Fax: 1 608 828 7500
www.gammex.com
e-mail: sales@gammex.com

Gammex-RMI LTD
Broadway Business Centre
32A Stoney Street
Nottingham NG1 1LL
United Kingdom
+44 0115 9247188
Fax: +44 0115 9247189
e-mail: uksales@gammex.com
(EU Representative)

Gammex-RMI GMBH
Bergstrasse 2
35398 Giessen
Germany
+49 6403 774 2293
Fax: +49 6403 774 2526
e-mail: desales@gammex.com

ISO 13485
Certified Quality System

Gammex

007890-00-00 AccuChrom 3 User Guide