



LC&D Micropanel Operation, Programming and Maintenance Manual

Project Name:
Project Location:
Acuity Agency:
Order #:
PO #:
Project ID:
Date:

Controls Tech Support:

1-800-535-2465 - option 1: nLight; option 2: SSI; option 3: Fresco; option 4: Synergy; option 5: LC&D/Bluebox; option 6 ROAM

To preschedule a call with tech support (providing a 4 hour business lead time) go to the following link: <http://www.acuitybrands.com/resources/schedule-support-request>

Additional Technical Literature:

<https://www.acuitybrands.com/products/controls/lcd>

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GR 2404/8 -IDIM and -iDH



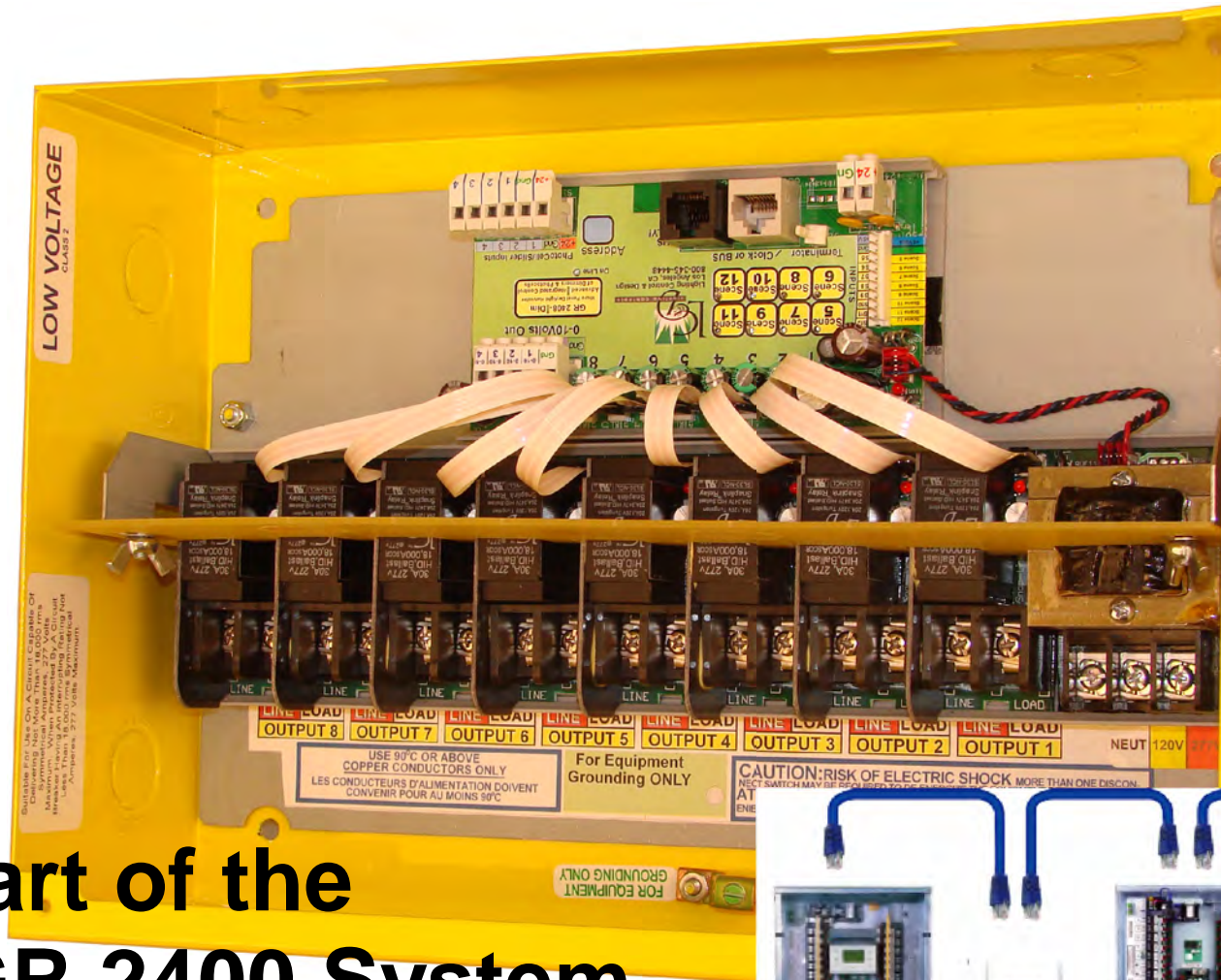
MANUAL



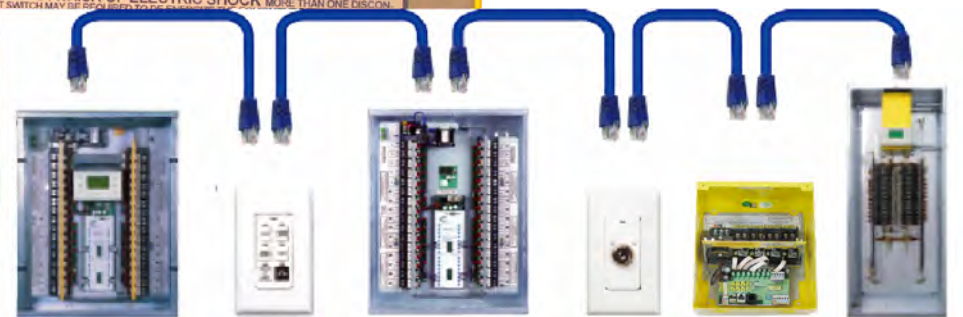
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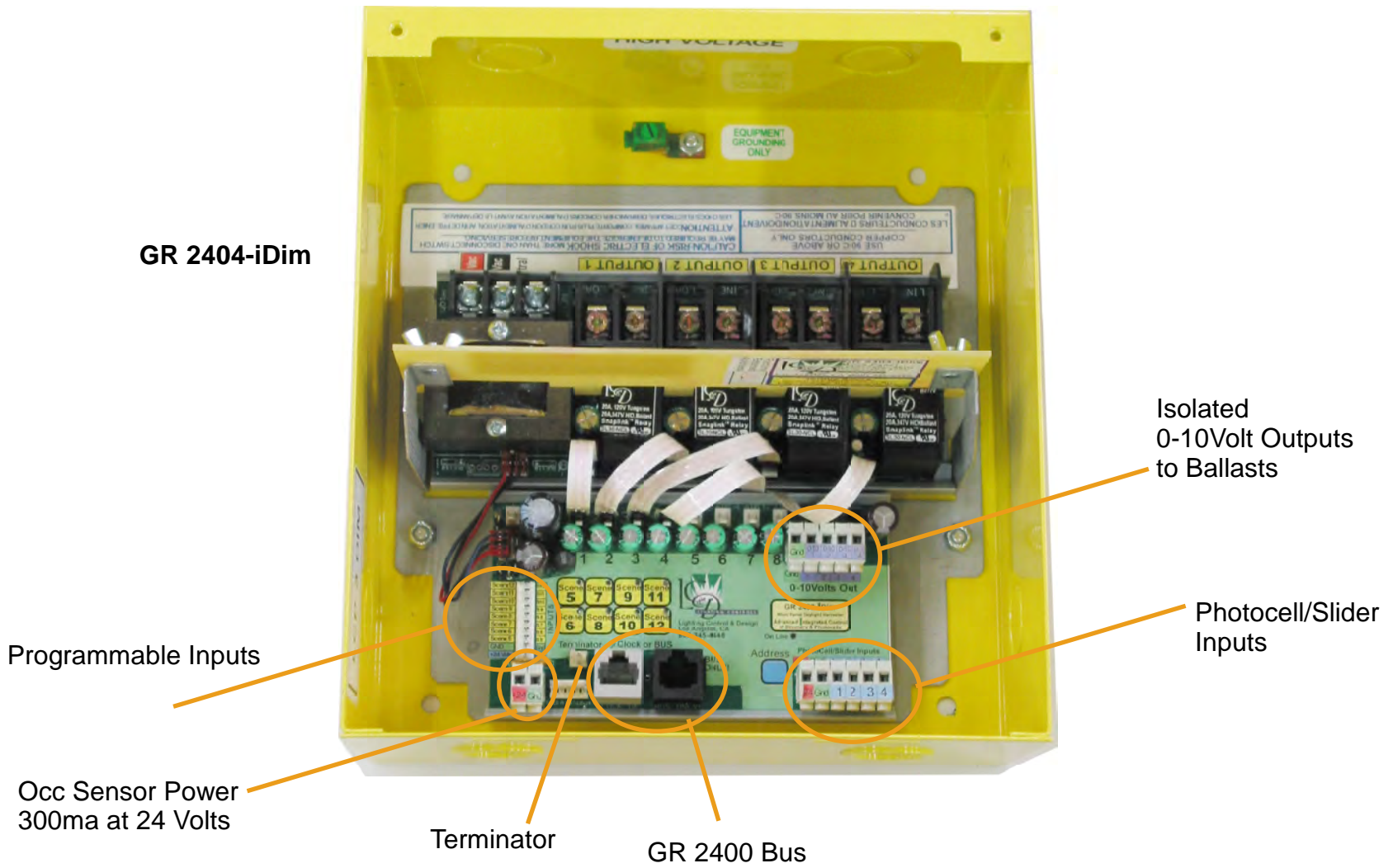
The Micro-Panel iDIM & iDH



Part of the
GR 2400 System.

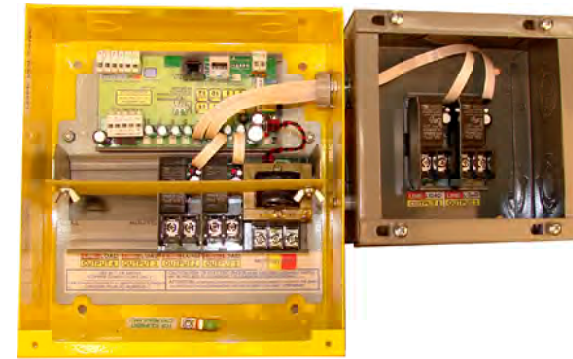


GR 2400 Master Panel Chelsea GR 2400 Slave Panel KeySwitch *MicroPanel* *SmartBreaker*

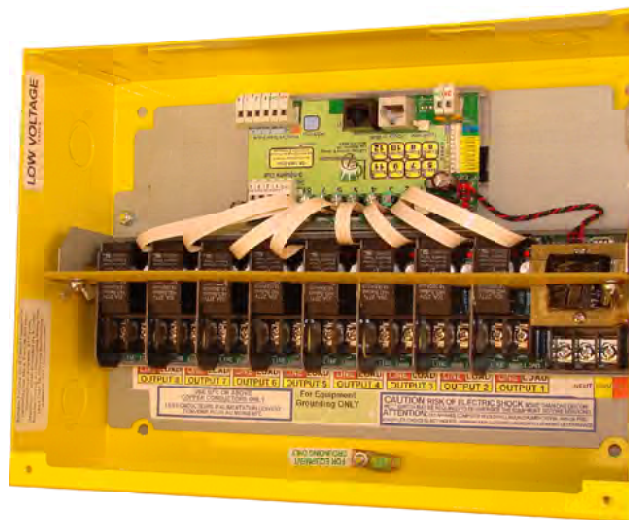


The GR 2404-iDim or iDH have the same components with one minor difference. The iDH does not have the 0-10Volt outputs on the control card. There are 4 possible configurations of the Micro-panel as shown on the next page.

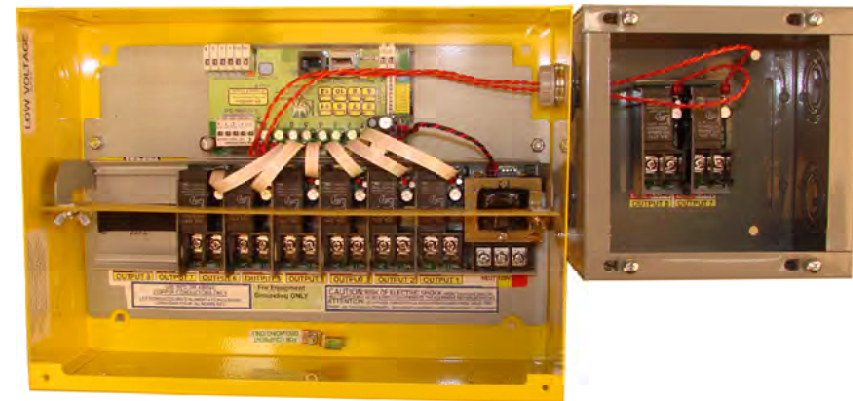
GR 2404 iDim or DH with no Emergency loads.

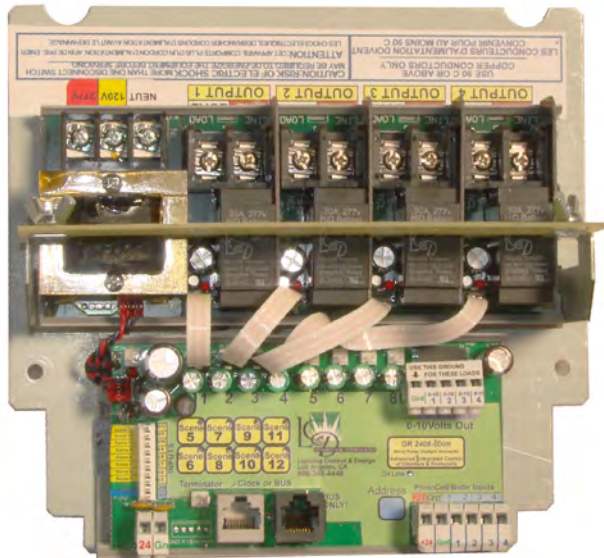


GR 2408 iDim or DH with no Emergency loads.



GR 2404/8 iDim or DH with Emergency loads. Emergency loads are usually in a separate enclosure depending on the number of loads. If there are less Normal Power loads then these would be in the separate enclosure. The Power for the electronics is usually on NORMAL power. Code allows this one sensing circuit in the Emergency enclosure. When NORMAL Power drops out the relays default to closed unless specified Normally open. Note that the emergency loads shown are relays that have been removed from the main compartment.





The Enclosure

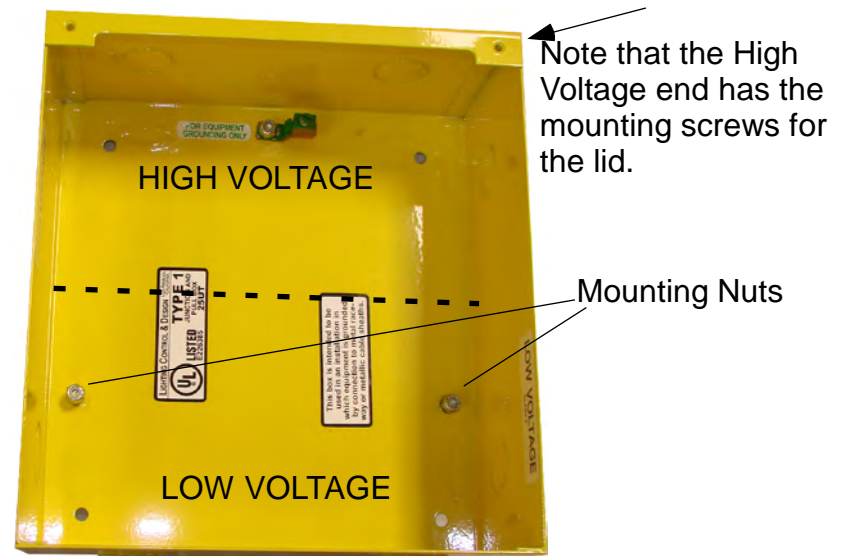
The Micro Panel IDIM and Micro Panel IDH (DH for Daylight Harvesting) are self contained units operating as part of the GR 2400 system. As such all parameters may be programmed both locally and remotely via a modem or over the internet.

Enclosures may be shipped in advance and the back plates with the electronics shipped later. Make sure that any line voltage conduit is connected to the correct knock outs.



Note that the Low voltage Knock Outs have a label on them. The High voltage KO's are unlabeled.

The Back Boxes are shipped with the mounting nuts. A nut driver can be used to remove them and then tighten down the back plate using the Star washers provided. The star washers ensure a good earth ground to the back plate .



Overview of the system

The iDIM-04 can switch and dim up to 4 circuits. The 0-10 Volt fluorescent dimming ballast control works with many brands of ballasts. Chief among them is the Advance Mark **7**. Make sure that the ballasts being used are 0-10 Volt ballasts. Advance Mark **10** Ballasts are NOT compatible with this form of control. Call our 800 number immediately if your project has Advance Mark 10 or any ballast that requires a “phase control” signal.

The iDIM has very powerful daylight harvesting features providing more programmable control of its response to photocells than any other system on the market.

The iDH uses almost identical electronics except for the 0-10V dimming is omitted. Many of the powerful daylight harvesting features that are applicable to switched or stepped photo control are also available on the iDH.

The iDIM with a booster board may be configured for use with HID Ballasts that take a 0 to 10 or a 10 to 0 control signal.

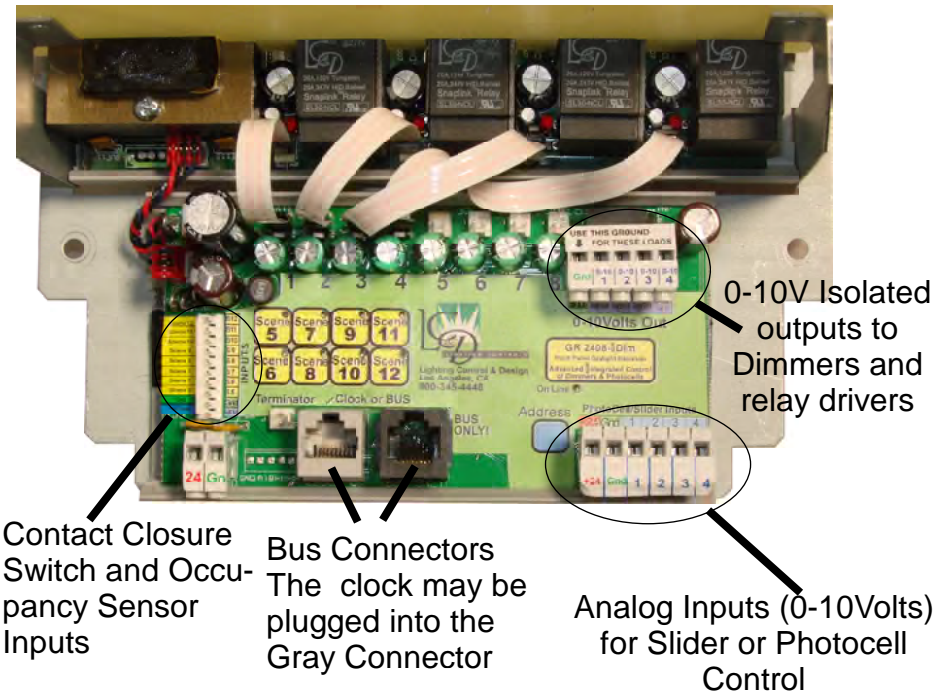
The iDIM -08 and the iDH-08 are provided in cabinets with 8 relays. Unless the iDIM has two sets of control cards there are still only 4 dimming outputs available. The other 4 relays are just switched outputs. They do not have dimming outputs associated with them.

The control electronics are mounted in a barriered low voltage section. There are connections for the GR 2400 Bus and the GR 2400 Clock. There is an analog input that can accept an LC & D slider control or Photocell unit.

A 10 pin header is for Dry Contact closure switches and occupancy Sensors that operate the scenes directly.

On board push buttons enable direct control of the Scenes for testing and override uses. These buttons may be omitted on future versions of the control card.

The MP-iDIM-HID Version of the panel adds an additional low voltage control card and transformer. The Control card inverts the 0-10 Volt dimming output to drive specific ballasts that require a 10-0 volts control signal. This card provides a high output current of 250ma per channel. Since these are HID lights with long re-strike times the Off buttons function differently so that they do not automatically open the relay. In order to set the HID mode see page 17.



Description-High Voltage Section

The high voltage section contains the transformer. This can accept both 120volt or 277volts. Note that whatever voltage is used the other terminal is live! Thus if 120 Volts is connected, the 277Volt terminal will measure 277 Volts.

Though one may use the same power as that used for the outputs it is best to have a separate breaker power the electronics. Multiple sets of electronics can be powered from the same breaker. This gives the additional advantage of being able to bring all the loads ON by de-powering the electronics since the relays default to normally closed.

The output relays are rated to switch 30 amps ballast at 277 Volts.

The 0-10Volt connections are in the low voltage compartment. In some areas the code requires the wires connecting the 0-10Volt control signals to be run separately from the high voltage. In other areas the code allows the wires to be run in the same conduit as long as the insulation of the wire is the same.

Make sure that your 0-10 Volt wires are run as per the code for your area.



4 Relay Micro Panel



8 Relay Micro Panel

Hooking up the 0-10 Volt Signal

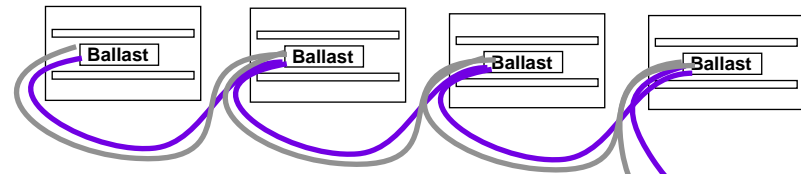
Most dimming ballasts follow the same color code.

VIOLET: The Control signal

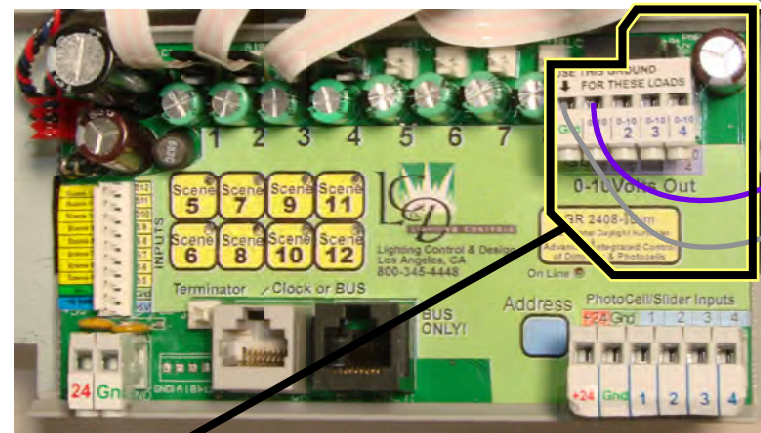
GRAY : The common or Ground Signal. Note: this is **NOT** EARTH Ground, it is a separate floating ground.

Similarly the Gnd connector on our control board is not only **NOT** Earth Ground it is also isolated from the Ground of the GR 2400 bus. In fact the whole 0-10 Volt section of the Dimmer is separate and isolated from the rest of the system with opto isolators.

This prevents a ballast failure or other event that might put 277 volts on the “low Voltage” wires from causing the whole system and all low voltage electronics from becoming “live.”



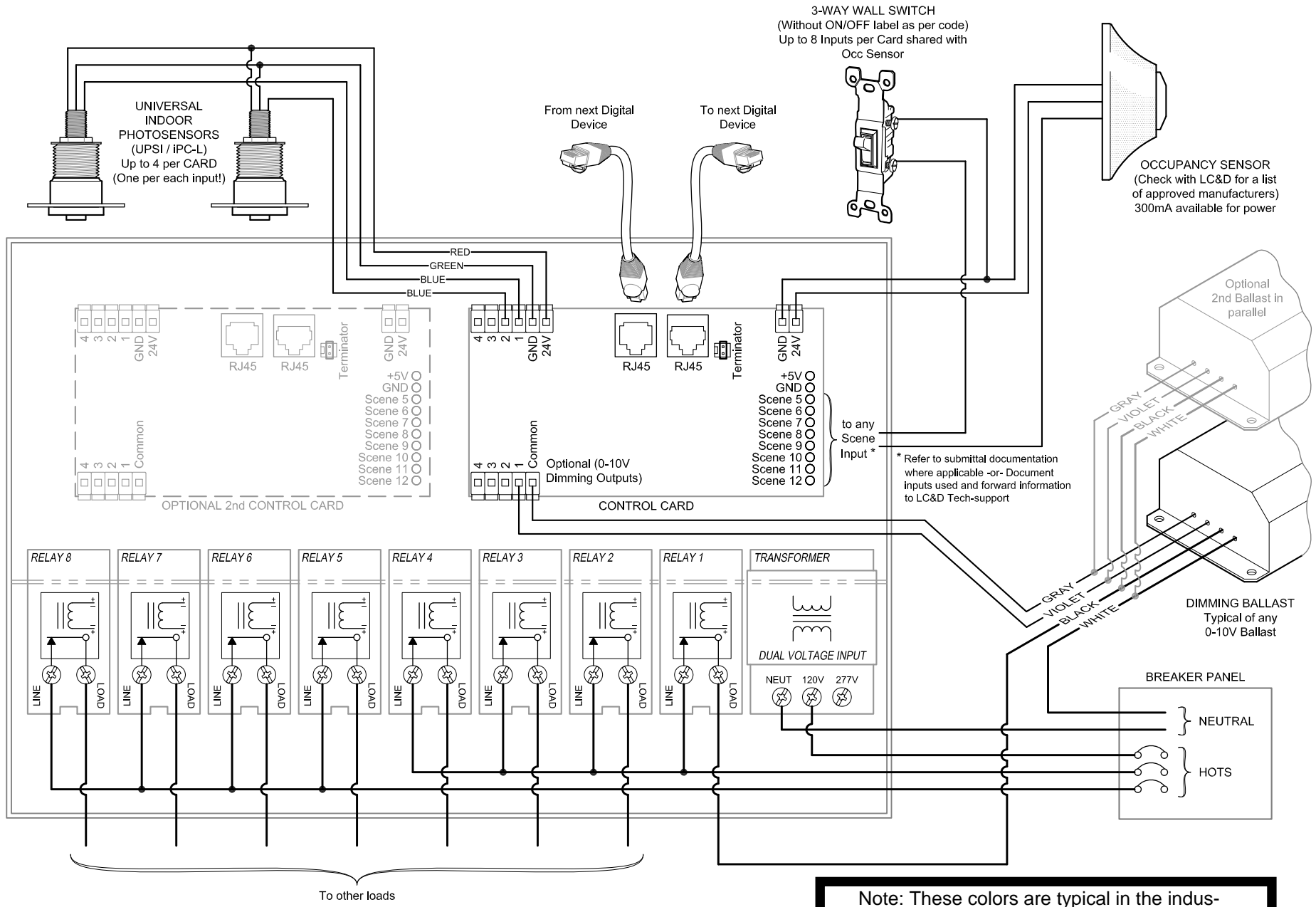
Only connect the Gray or “0 Volts” wire from the ballasts to this point



This section is on a separate isolated power supply.

Number of Ballasts

Each 0-10 Volt output can provide up to 15 milliamperes both as a source and a sink to the connected ballasts. Depending on the brand of ballast this can usually drive the connected load. Most ballasts only require 0.1 milliamperes so that would be 150 ballasts. Allowing for a margin or error a load of 50 ballasts should not be excessive. For special ballasts that require more power a “booster board” is available and described later.



MicroPanel™ Connection Diagram

Note: These colors are typical in the industry but may be different for the actual ballast in use. It is vital that the diagram on the Ballast itself be followed.

Control Wires to a Zero to 10 dimming ballast

The National Electrical Code has been adopted in all states. However local bylaws may modify it and some states may operate on earlier versions than the 2002 Version quoted here. In all cases “the authority who has jurisdiction” meaning “the electrical inspector” may override or improve on any point in the NEC if he so wishes.

NEC 300.3 (c) (1):

“Conductors of circuits rated 600 volts, nominal or less, ac circuits, and dc circuits shall be permitted to occupy the same equipment wiring enclosure, cable, or raceway. All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the enclosure, cable, or raceway.”

The dimmed (0-10v) signal is not affected by being located near a line voltage circuit. Thus the 0-10v signal conductors and the line voltage (120/277/480v) circuits may occupy the same conduit. As long as the point above regarding the insulation of the conductors is covered.

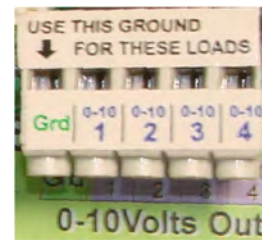
Make sure you are running your wires as per local codes and per the directions of the “authority having jurisdiction.”

Ordinary #12 THHN or even down to # 18THHN may be used between the (0-10v) dimming outputs and ballasts. There is no special requirement of shielded or twisted pair wire.

Emergency Power on Battery Packs

If the Emergency power is being provided by a battery pack and inverter AND there are occupancy sensors on the system an additional consideration is introduced. If there is no one present in the area one does not want to run down the battery pack or use the power where it is not needed.

In which case it would be better to power the Micro Panel itself from the Emergency power so that the lights will not come on unless there is someone in the room. The Micro Panel in the OFF mode pulls less than 2 watts. The average emergency light is more than 60 watts.



Note: The “Ground” or “Common” for the 0-10 Volts is isolated from “Earth Ground” and from the common of the GR 2400 system. ONLY attach the GRAY dimming wires to the “Ground” on the 0-10 volt connector.

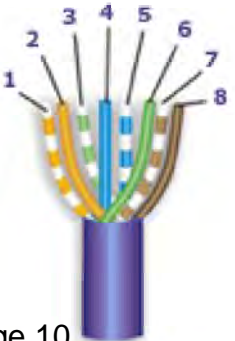
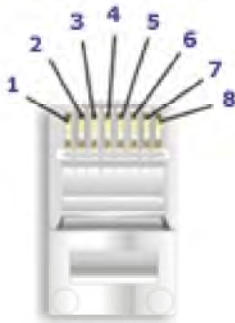
Connecting up the MP iDim.

Lighting Control & Design recommends the use of pre-made and pre-tested Ethernet style cables. These can even be pulled through conduit with little difficulty. In most cases the cabling does not have to be in conduit though plenum rated cable may be required.

Searching on the web for “Cat 5 Cable” will bring up many suppliers of both bulk and pre-made cables. Often the pre-made cables are cheaper than making them yourself. They also are a known quantity. Note: Cat 6 is also OK.

The color code used is “TIA/EIA 568B” (TIA=Telephone Industries Association, EIA = Electronic Industries Association.) This is the standard used for most “patch cables.” If you prefer to use the 568 A configuration that is also OK as long as both ends of the cable are identical.

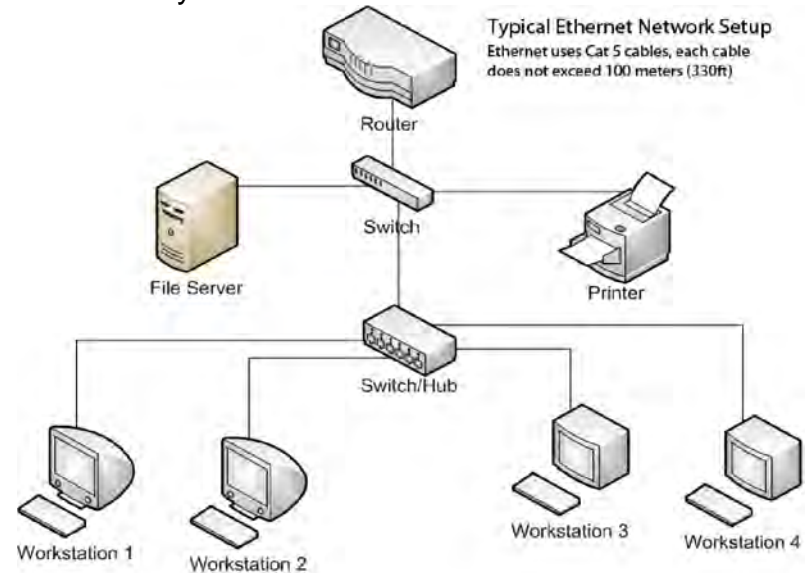
| Pair # | Wire | Pin # |
|--------------------|---------------------|----------|
| 1- White/Blue | White/Blue | 5 |
| | Blue | 4 |
| 2- White/Orange | White/Orange | 1 |
| | Orange | 2 |
| 3- White/Green | White/Green | 3 |
| | Green | 6 |
| 4- White/Brown | White/Brown | 7 |
| | Brown | 8 |



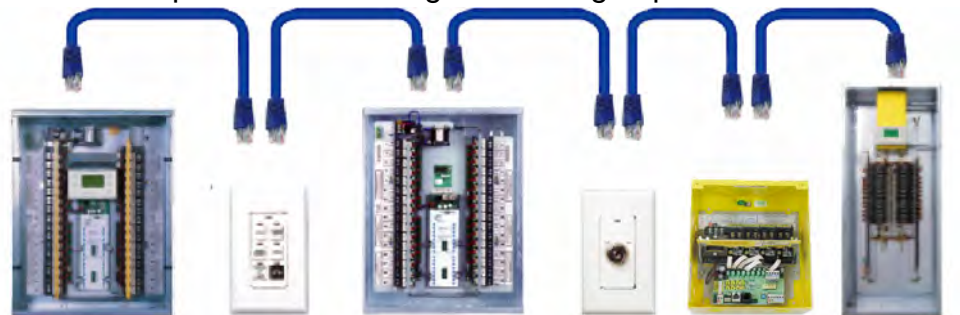
Page 10

The most common problem

The most common problem in any GR 2400 installation is bad crimping on cables. Cables that pass every conceivable test and work fine for Ethernet (which has a maximum allowed bus of 330 ft) do not necessarily work on the GR 2400 system.



The BIG difference between Ethernet and the GR 2400 is that the ethernet signal is cleaned up and re-transmitted at the end of each cable. In the GR 2400 system the wires are in parallel and the signal has to go up to 4000ft.

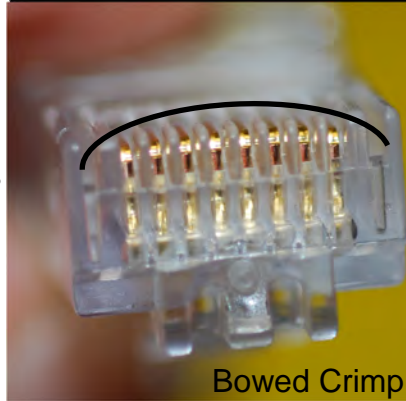
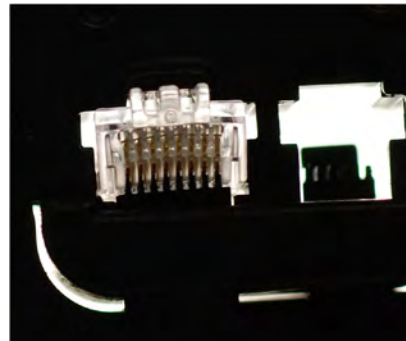


GR 2400 Master Panel Chelsea GR 2400 Slave Panel KeySwitch MicroPanel SmartBreaker

Thus any minor problem in a crimp, if repeated, deteriorates the signal at each location resulting in a signal that is too degraded to use at a certain distance along the bus.

Why it is so hard to make a good crimp

A hand crimper does not have the support needed to handle the pressure placed on the tangs to force them into the wire. As can be seen on the right the crimper is deforming the connector. When this connector is removed it springs back up into the bowed shape shown on the second picture. The two highest pins are in the center. These are the pins that connect to the pair that is carrying the data!

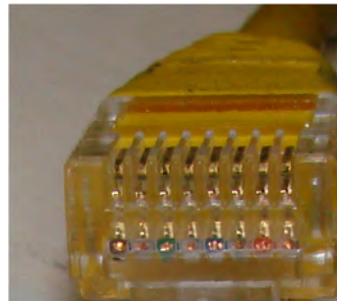


Bowed Crimp

Professionally made Crimps

A Patch cable made at a factory has these characteristics:

- They use stranded wire.
- The pneumatic crimper punches with very high pressure.
- They have a strain relief that is molded.



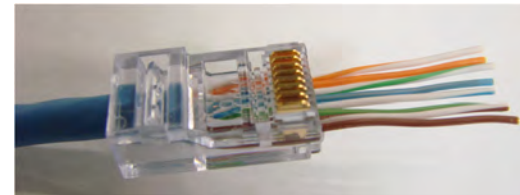
Stranded wire with Factory made Crimp

After much research we have found that the following factors are very important in making a good crimp.

a) The right materials.

1) We highly recommend using stranded wire. This is much more forgiving inside a wall box when connecting to switches. We have shown that it is possible to disconnect the outside wires of any connection made with solid wires and off the shelf connectors with just a few left right wiggles of the wire.

2) Use EZ-RJ45 brand connectors. These connectors let the wires protrude from the end of the connector prior to crimping. They are ONLY available as suitable for both stranded and solid wire. Once crimped the additional length of wire beyond the crimp makes the connection that much more reliable.



3) The right crimper. Though EZ-RJ45 does make a crimper that cuts off the additional wires nicely it prevents the tangs from being fully seated. 100% of crimps made with this crimper have a bow in them.

The crimper available in the Kit sold by LC&D is a ratcheting crimper that so far gives the best crimps if used correctly. Many other companies private label this crimper that has "PATENTED TAIWAN" stamped into it and looks like the picture on the next page.

The big plus on this crimper is that there is no stop at the end of the ratchet to prevent the crimp from going any further. This crimper allows "over crimping."

Crimp and Test Kit from LC & D

The crimper Kit contains all the tools needed to make really good crimps along with a booklet that explains far more than there is room for in this manual. The bag of Connectors provided are EZ-RJ45 brand.

This is shipped with all larger systems.

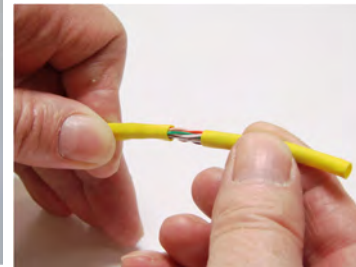


Steps to making a good RJ45 Crimp

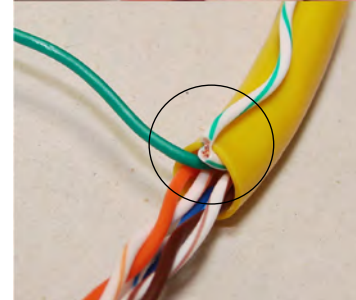


Note: We very strongly recommend stranded wire. It is not nearly as difficult to make a good crimp with stranded.

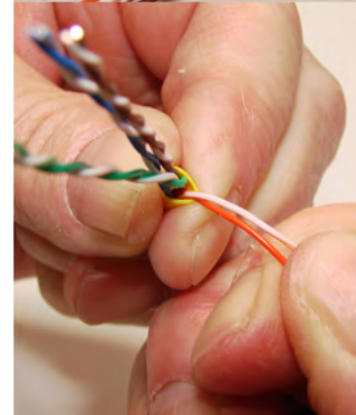
Use the insulation stripper to gently score the outside insulation



Pull off the insulation.



Too much pressure on the stripper can nick a wire. Be careful! And visually check no insulation has been compromised.



Untwist and straighten out each of the pairs. In our application it is not super critical to keep the pairs twisted right up to the connector as it might be in an Ethernet cable.



The Recommended Crimper

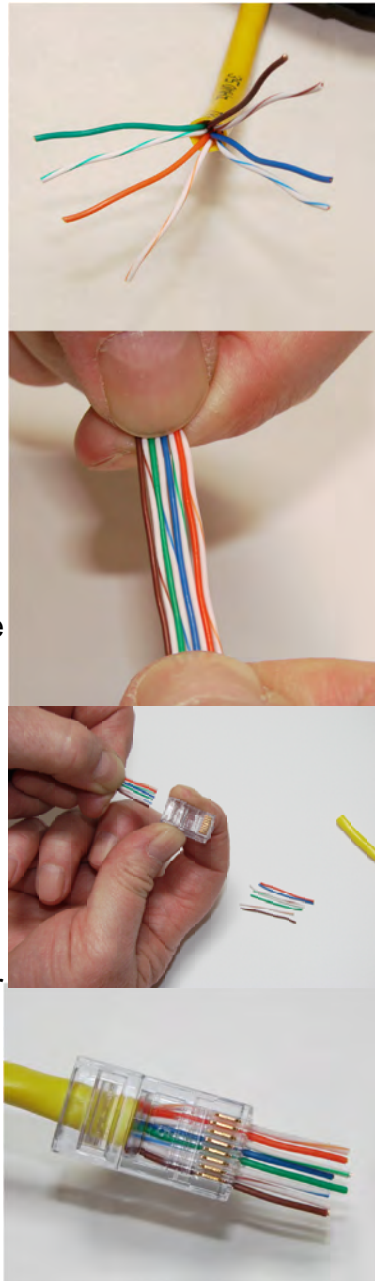
Now your wires are separated, line them up starting with the White/Orange wire. The order:

- White/Orange
- Orange
- White/Green
- Blue
- White/Blue
- Green
- White/Brown
- Brown

Once all the colors are correct flatten the wire with a stretching, wiggling and pulling motion of your right hand while holding the insulation in your left hand.

Cut off the ends of the wire off leaving about 3/4 of an inch. This gives a straight end to the wires with no tendency to twist when they are inserted into the connector.

Push the jacket all the way in for a good strain relief. Check that the wires did not twist and that they are correct. OOPS! Do you notice something wrong on the right? There are two solid colored wires next to each other. Pull the wires out and do it again!



Now the crimp.

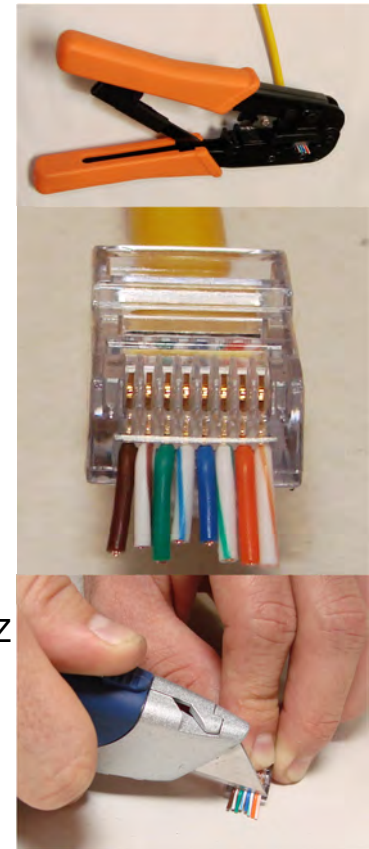
- a) The first crimp is a slow but certain crimp to maximum pressure.
- b) Now do 5 to 10 very fast very hard crimps. Pretend you are a Pneumatic Hammering crimp machine. This is what gets rid of the bow.

This crimp had 10 hits: see how nice and flat the result is and the wires are all correct.

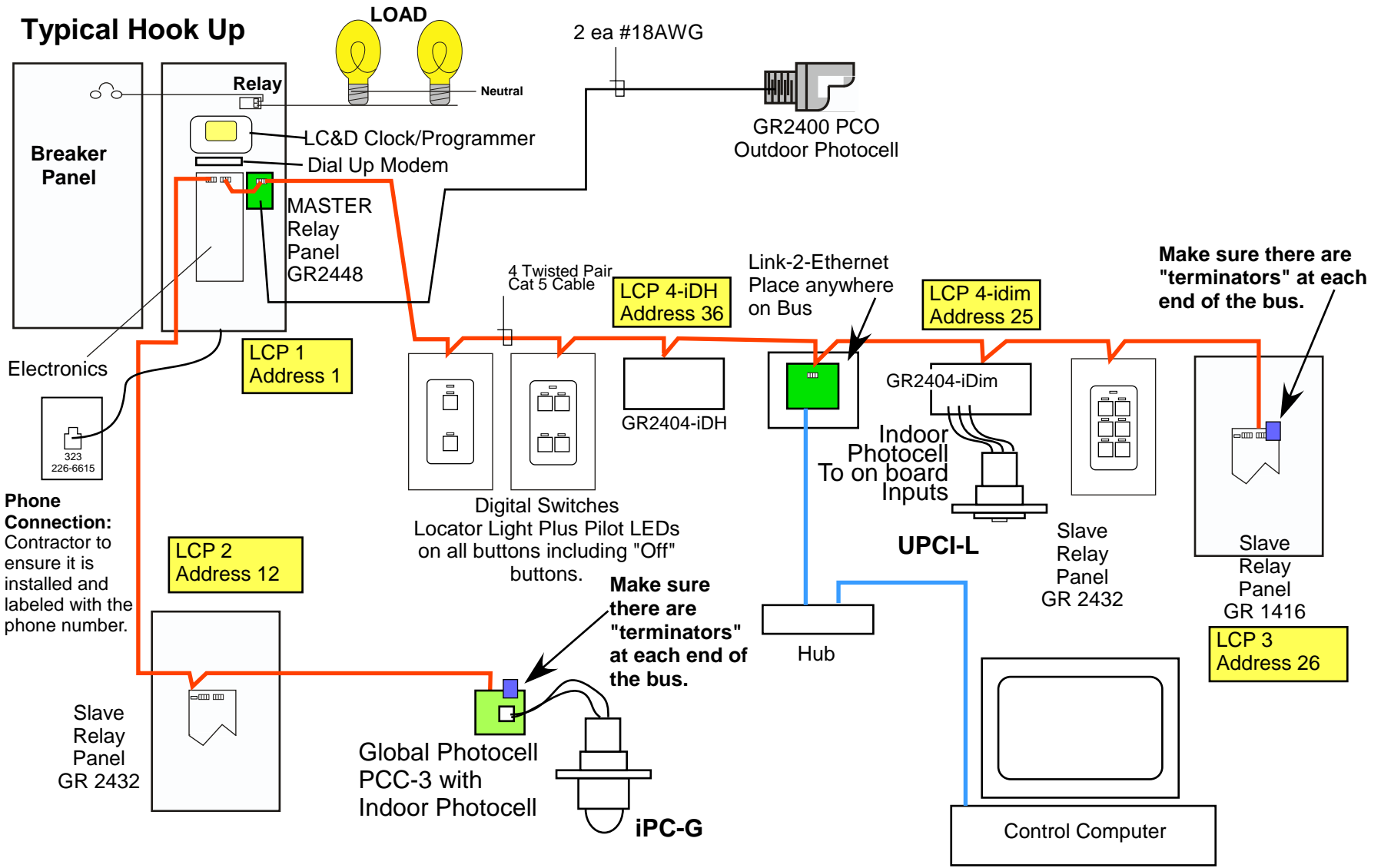
Cut off the excess wire with an EZ RJ 45 Brand Crimper (it can do this even if it can't be used to crimp) or an Xacto Knife.

Visually inspect the connector! The wires must be cut off flush with the end of the connector. Otherwise they will not seat properly in the jack.

Finally repeat the process at the other end of the cable and TEST the cable with the cable tester. Realize that the cable tester ONLY shows electrical connection and no crossed cables. The most reliable test of a cable is the VISUAL INSPECTION of the crimp. Reflect the light off the tops of the connections. Oxide or missing gold on the connector is a failure. Cut it off and do it again. Ultimately this saves hours and hours of trouble shooting time.



Typical Hook Up



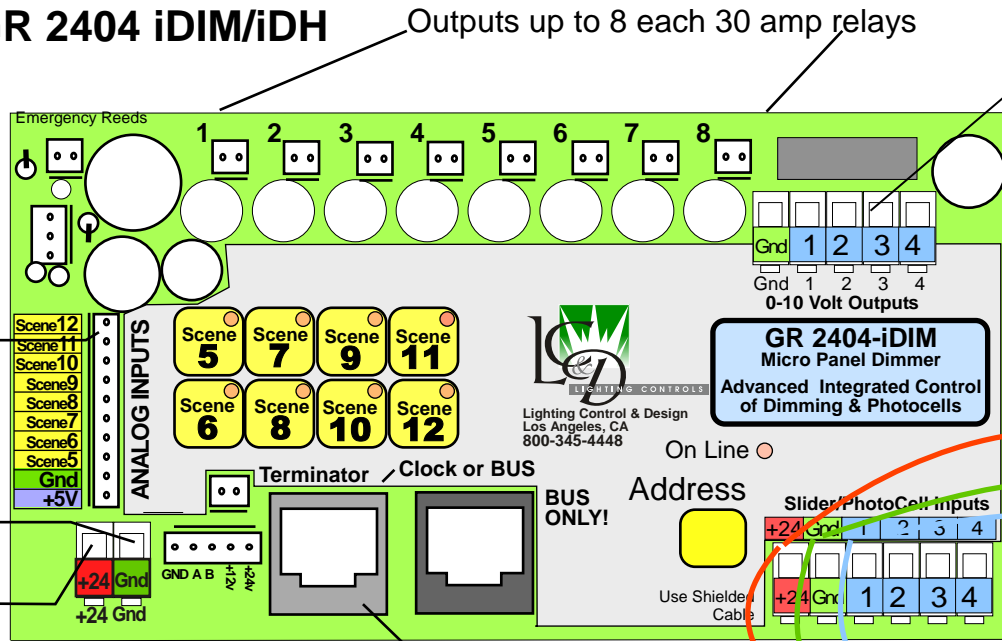
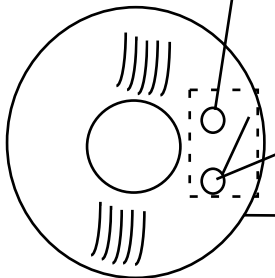
The GR 2404/8-iDim or iDH are part of the GR 2400 system. They sit on the GR 2400 bus allowing all their parameters to be accessible over the System. A typical system has both centralized and distributed panels along with switches and photocells.

Make sure that the bus is terminated at both the first and last component on the bus. Note that the bus is daisy chained and there are no spurs or "T" taps allowed.

Wiring details for the GR 2404 iDIM/iDH Control Card

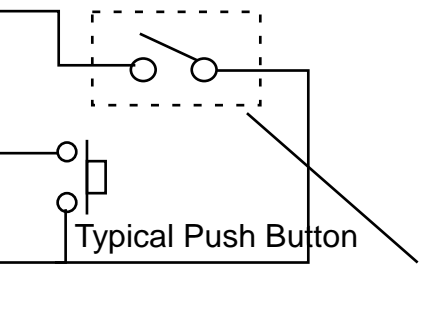
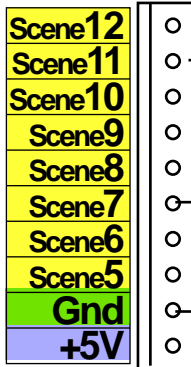
Occupancy Sensor With Normally Open Relay. Connect to any Scene Input

See Page 23 for expanded Diagrams e.g.: Mytech DT500RP



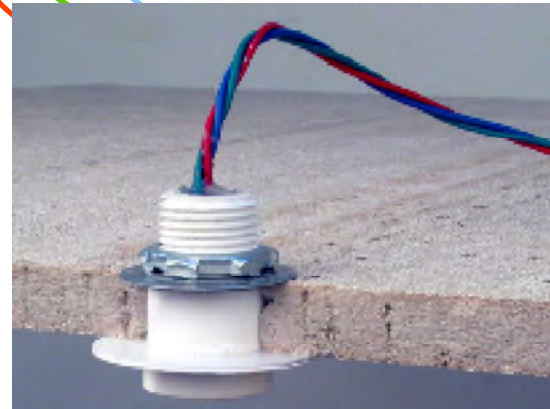
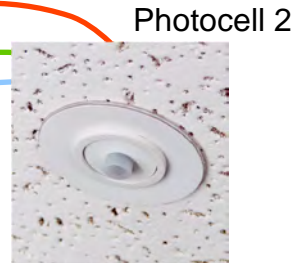
+12 or +24 Vdc for OS

Data Bus connections Use Category 5 - 4 twisted pair cable.



Occupancy sensor with dry contact output or "open collector" Output that pulls low.

Dimming Outputs for the first 4 loads, NOT available on iDH panels



Photocell 1. UPCI-L (Universal Photocell-Local) A Scene may use directly connected photocells as shown or a "global" photocell that is connected to a control card on the Bus.

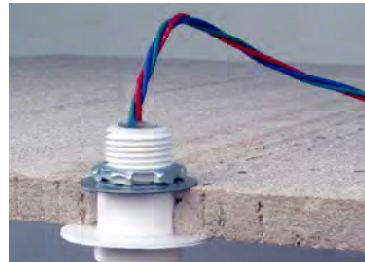
Occupancy Sensors: Any Manufacturer's Occupancy sensor may be used. Sensors may be powered from +24Vdc. The O/S Inputs are for dry contacts and types of sensors that pull Low. Each Dimmer may be assigned individually to one or more sensors. (Last input overrides.) Occupancy sensors turn a SCENE on or off. The Scene may be programmed to go to a set level or enable a photocell program.

Types of Photocell

Before continuing into the next section there needs to be an orientation on the two types of Photocell that can be used with the system.



UPCI-L



UPCI-L mounted in a Ceiling Tile

UPCI-L (Universal Photocell Interior-Local) and iPC-G (iPhotocell-Global)

The iPC-G is a two wire photocell sensor that is connected to a Photocell Control Card by two #18 twisted pair wires. The photocell may be mounted up to 200 ft from the card. A PCC3 has inputs for up to 3 photocells.

The UPCI-L is connected directly to the slider inputs of a Micropanel iDIM or iDH. It requires 3 # 18 wires and should be placed not more than 150 ft from the Micro panel. Longer distances require the use of Shielded wire. A Shielded pair may be used with the shield acting as the Ground conductor.

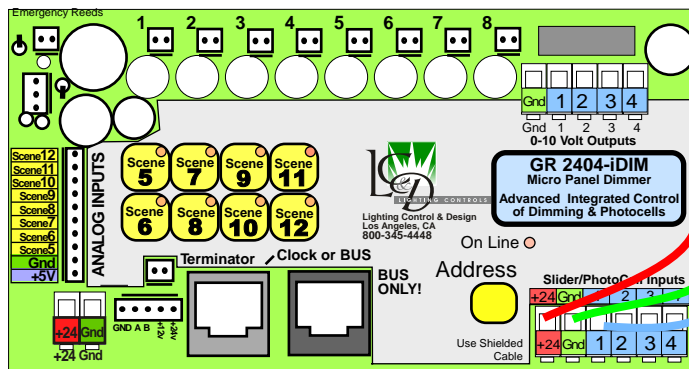
Global Photocells: PCC1 and PCC3 Cards

LC & D offers two styles of Photocell input cards that may sit on the GR 2400 bus and send levels over the bus.

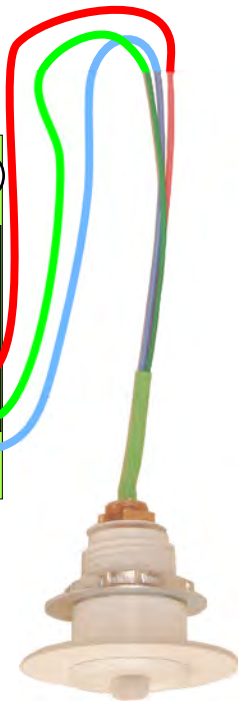
The PCC 1 (Photocell Control Card with one Input) takes a single outdoor photocell. It is not generally used for indoor photocells since it does not have a digital enable/disable feature.

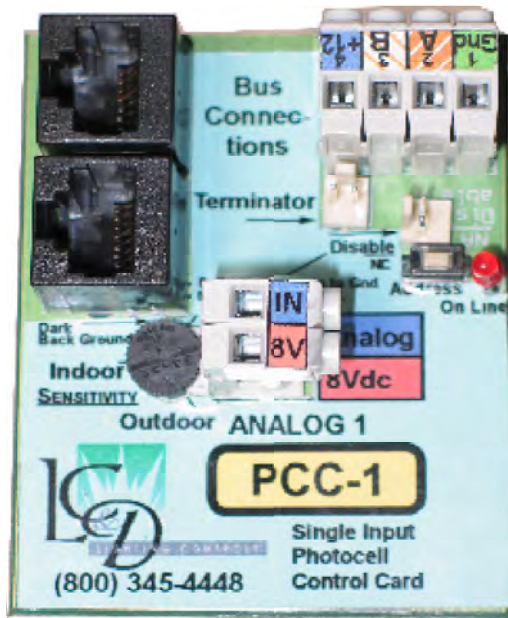
The PCC 3 cards accepts three photocells which may be enabled or disabled over the bus. For non dimming relay panels the PCC 1 or 3 act like light level controlled switches and may turn ON and OFF relays at specific numbers which equate roughly with footcandles.

When used with an iDH or iDim panel, just the readings of the photocell are reported and the programming within the scene uses the data to control the loads.

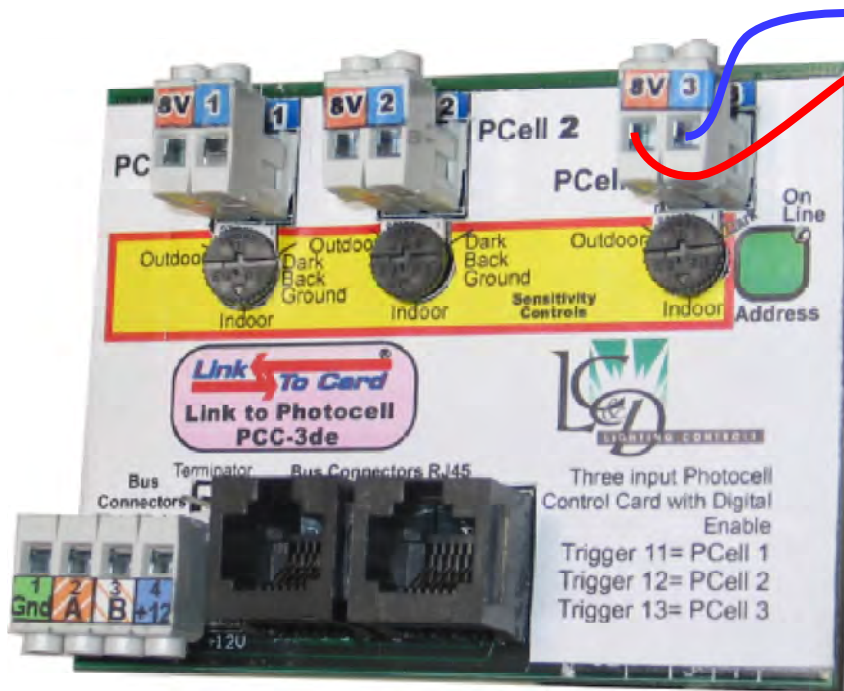


iPC-L shown connected to an iDim Card





PCC1, Photocell Control Card with one Input



PCC3, Photocell Control Card with three Inputs

Addressing Global Photocell Cards

Only 10 Photocell cards may be used for providing global readings for an iDIM or iDH on the bus. Since each of those cards can be a PCC3 this means that up to 30 photocells may be global. This count does not include the photocells that plug directly into the iDIMs or iDHs. The number is limited in order to ensure sufficient speed of update (once per second with 30 photocells and quicker with less) while not clogging up the bus with data.

The photocell cards **MUST** have sequential addresses in order to be accessed. If an additional photocell card is used for some other feature such as an outdoor photocell it can be placed at a non sequential address that has a higher number.

For Instance there might be 4 PCC3s at addresses 20, 21, 22 and 23 being used with iDIMs and another PCC1 at address 75 for use with GR2400 panels handling outside lights

iPC-G for use with Photocell Control Cards

Note that the iPC-G has no sensitivity adjustment. It may be placed up to 200 ft away from the control card using 2 # 18awg twisted pair conductors.

Sensitivity is adjusted at the control card and would usually be set about half way and adjusted from there. A PCC3de (Digital enable) may be enabled/disabled over the bus. This feature is not needed for use with an iDIM



Page 17 **iPC-G**

Photocell placement OPEN LOOP

By Open Loop is meant that the photocell reads the level of the ambient light outside the room, coming in through a skylight or a window. It assumes that the relationship between the brightness of the light entering the area and the brightness of the area is relatively constant. This proves to be true in practice and makes for easier setting of the control curves since one does not have to account for the electric light inside the space.

Rules of thumb for placing the Photocell:

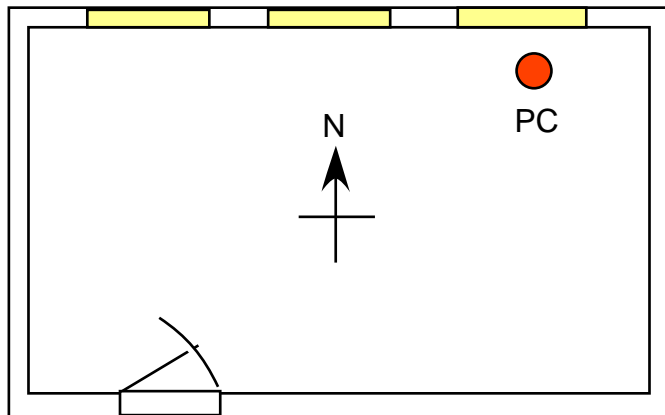
Make sure it can see an area that represents the brightness to be measured.

Do not place where it can “see” direct sunlight.

Try to view a North Facing aspect.

Make sure there is no contribution from the lights being dimmed.

If Blinds are going to be used in the room, make sure the photocell is inside the blinds.



Photocell placement CLOSED LOOP

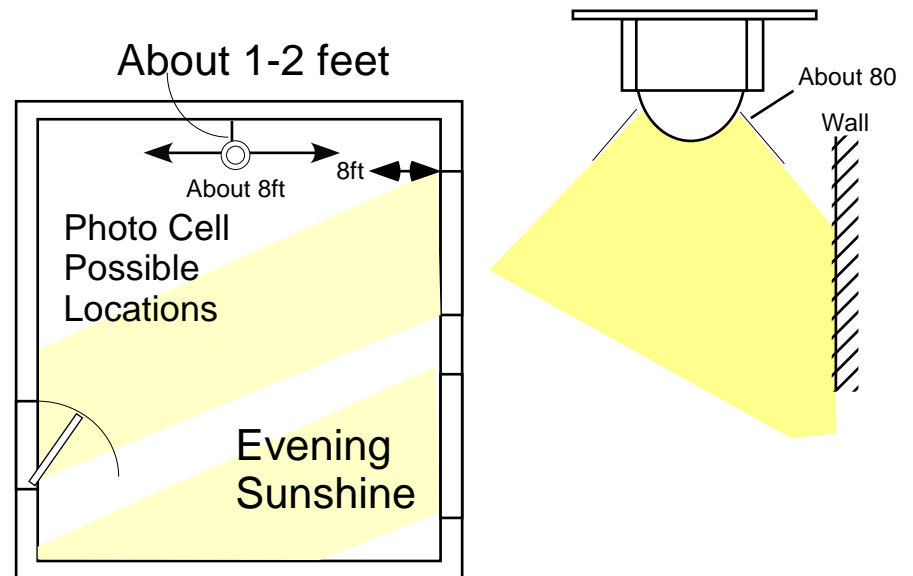
By Closed Loop is meant that the photocell reads the level of the ambient light made up of both the light being dimmed and the contribution from a window or a skylight. It is considered more difficult to calibrate because the placement of the photocell is more critical.

Rules of thumb for placing the Closed Loop Photocell:

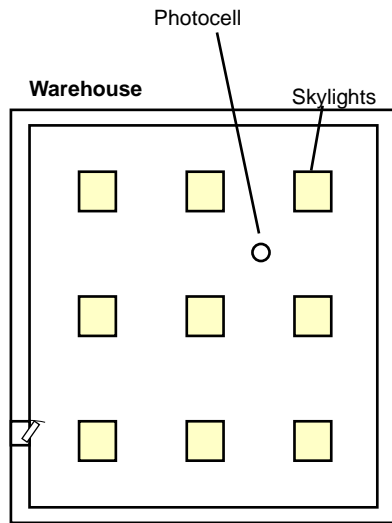
Make sure it can see an area that represents the brightness to be measured.

Do not place where it can ever “see” direct sunlight.

Make sure the contribution from the lights being dimmed is approximately equal to the contribution from daylight.



Top-lit locations

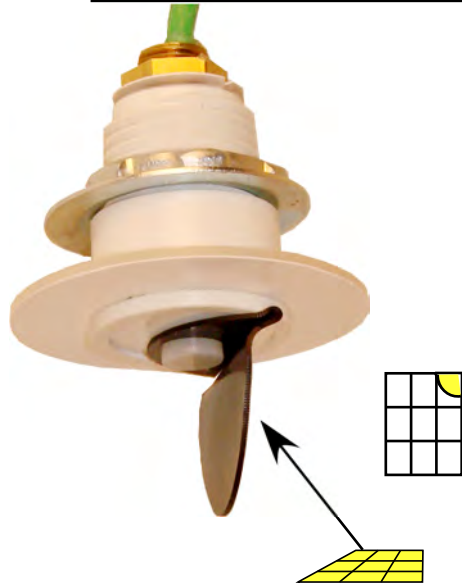


For top-lit (skylight) applications the photocell should see the effects of the daylight, the lensed dome collects from a larger area and should average the light from the internal lights and the contribution of the skylight.

The suggestion in the diagram is only a suggestion. Once again it is important to work out the best placement so that the photocell sees a representation of the brightness of the room. Thus the contribution from skylights and electric lights should be about half and half.

Blocking off overbright areas

Sometimes a window or a local electric light can overwhelm the photocell and make all other areas of no consequence. In this case use the clip on shields to protect the photocell from the offending source.



Lumen Maintenance

Lumen Maintenance is a specialized situation where there is no contribution from Daylight. The purpose of the system is to maintain the brightness of an area in spite of the deterioration of the brightness of the sources.

This is usually an HID lighting problem. HID Lights can lose as much as 40% of their brightness before the bulb must be replaced.

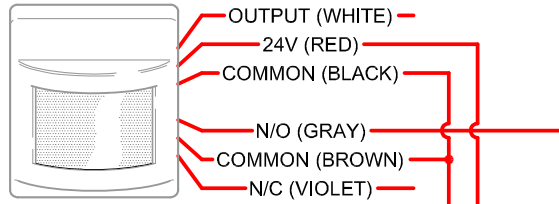
In this case one is placing the photocell to capture a location, Usually a white wall, that represents the brightness of the room.

It is particularly vital in this application to make sure that the photocell will not be "spooked" because that area of wall is used for notices and a dark notice or an extra reflectance such as a glazed picture or certificate placed on the wall throws off the calibration.

REMINDER: Photocells on the bus to be used with dimmers must have addresses that are in sequence. Any break in the sequence and the upper numbers will be ignored. Photocells to be used with dimmers are the first set of photocells on the bus.

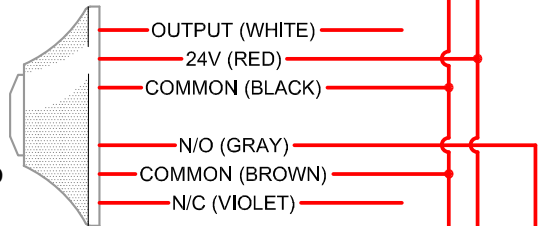
Hooking up Occupancy Sensors

Only use occupancy sensors that have “dry contact outputs.” these are usually designated as -R or some other option to indicate that an additional relay has been added for building automation purposes.



WALL SWITCH LOW VOLTAGE DECORATOR SENSORS
 LCD-WSD-LV-R PASSIVE INFRARED (PIR)
 LCD-WSD-PDT-LV-R PIR/MICROPHONICS (PDT)

Occupancy sensors may be powered from the On board 24Volts or sometimes 12 volts. Up to 300ma is available at 24 volts. This is enough for 8-10 sensors depending on brand. Note this is twice the available current of earlier versions of the card.



STANDARD RANGE LOW VOLTAGE 360° SENSORS
 LCD-CM-9-R CEILING MOUNT, PASSIVE INFRARED (PIR)
 LCD-CM-9-PDT-R CEILING MOUNT, PIR/MICROPHONICS (PDT)
 LCD-RM-9-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
 LCD-RM-PDT RECESSED MOUNT, PIR/MICROPHONICS (PDT)
 LCD-CMB-9-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)
 LCD-CMB-PDT-9-R FIXTURE MOUNT, PIR/MICROPHONICS (PDT)

Connect occupancy sensors to the the Scene Input indicated on the paperwork that came with the system.

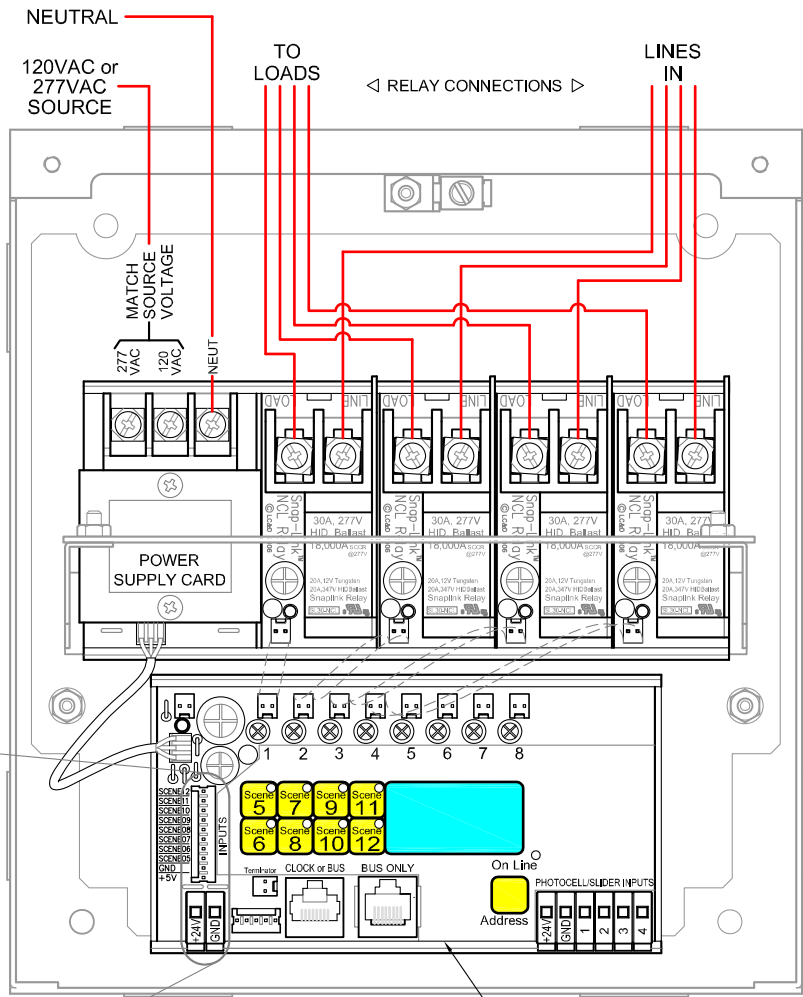
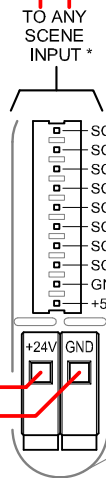
EXTENDED RANGE LOW VOLTAGE 360° SENSORS
 LCD-CM-10-R CEILING MOUNT, PASSIVE INFRARED (PIR)
 LCD-CMT-PDT-10-R CEILING MOUNT, PIR/MICROPHONICS (PDT)
 LCD-RM-10-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
 LCD-RM-PDT RECESSED MOUNT, PIR/MICROPHONICS (PDT)
 LCD-CMB-10-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)
 LCD-CMB-PDT-10-R FIXTURE MOUNT, PIR/MICROPHONICS (PDT)

WIDE VIEW & HALLWAY LOW VOLTAGE SENSORS
 LCD-WV-16-R WIDE VIEW SENSOR, CORNER MOUNT, PASSIVE INFRARED (PIR)
 LCD-WV-PDT-16-R WIDE VIEW SENSOR, CORNER MOUNT, PIR/MICROPHONICS (PDT)
 LCD-HW-13-R HALLWAY, WALL MOUNT, PASSIVE INFRARED (PIR)

HIGHBAY LOW VOLTAGE 360° SENSORS
 LCD-CM-6-R CEILING MOUNT, PASSIVE INFRARED (PIR)
 LCD-RM-6-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
 LCD-CMB-6-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)

HIGHBAY LOW VOLTAGE AISLEWAY SENSORS
 LCD-HM-50-R SURFACE MOUNT, PASSIVE INFRARED (PIR)
 LCD-RM-50-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
 LCD-CMB-50-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)

HIGHBAY LOW VOLTAGE END-OF-AISLEWAY SENSORS
 LCD-HM-10-R SURFACE MOUNT, PASSIVE INFRARED (PIR)
 LCD-HMB-10-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)

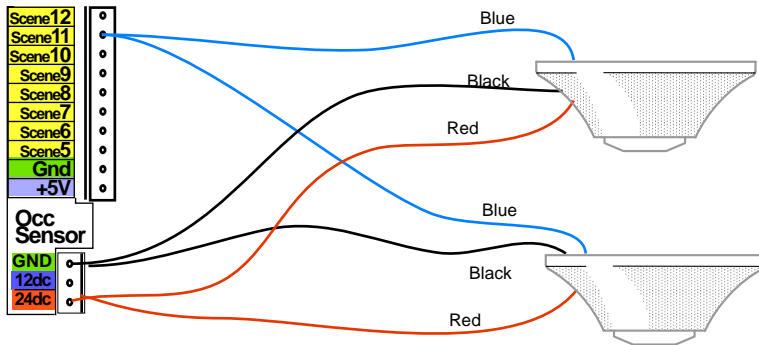


* SCENE INPUTS:
 REFER TO SUBMITTAL DOCUMENTATION WHERE APPLICABLE.
 - OR -
 DOCUMENT INPUTS USED AND FORWARD INFORMATION TO LC&D TECH SUPPORT.

GR 2404-iDim/DH MicroPanel

Multiple Occupancy Sensors

If more than one Occupancy Sensor is being used with the GR 2404 DIM they can be wired in parallel if in the same room. If in multiple rooms then use different inputs.



Diagrams for other brands of Occupancy sensors can be found on the Downloads page at the LC & D web Site:

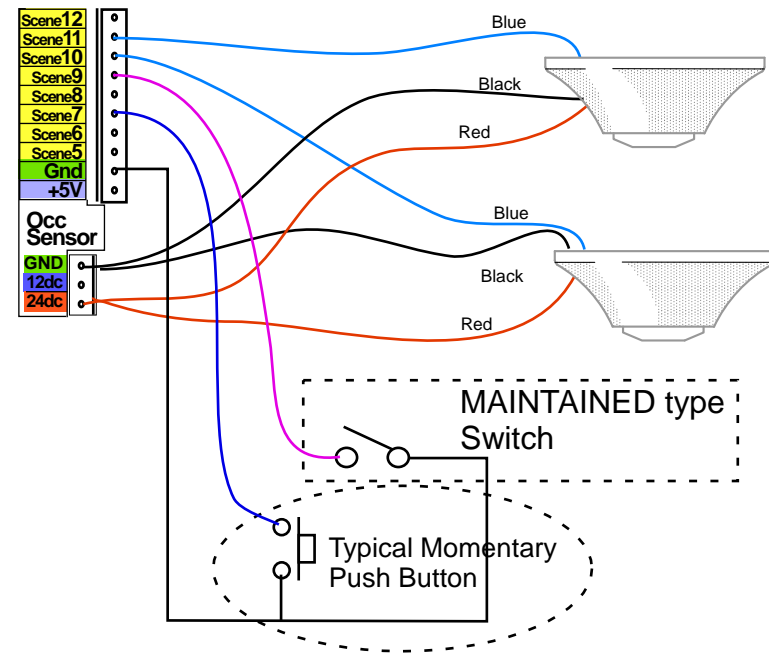
www.lightingcontrols.com

Hard wired Over-Ride Switches

The quickest and easiest way to provide an override switch is to connect a Digital GR 2400 switch. This has full access to the system and can be programmed from the DTC Clock or by the factory over a phone line connection.

If a Hard wired switch option has been chosen then one may use either a Momentary action or Maintained Action switch. The type of switch **MUST** be specified in the Relay Properties menu. (See page 31 of this manual.)

One may have an Occupancy sensor turn on the lights and still use the override to turn off the lights as one leaves. This may take some discussions with Tech support at (800) 345-4448 to work out how to program what you want.

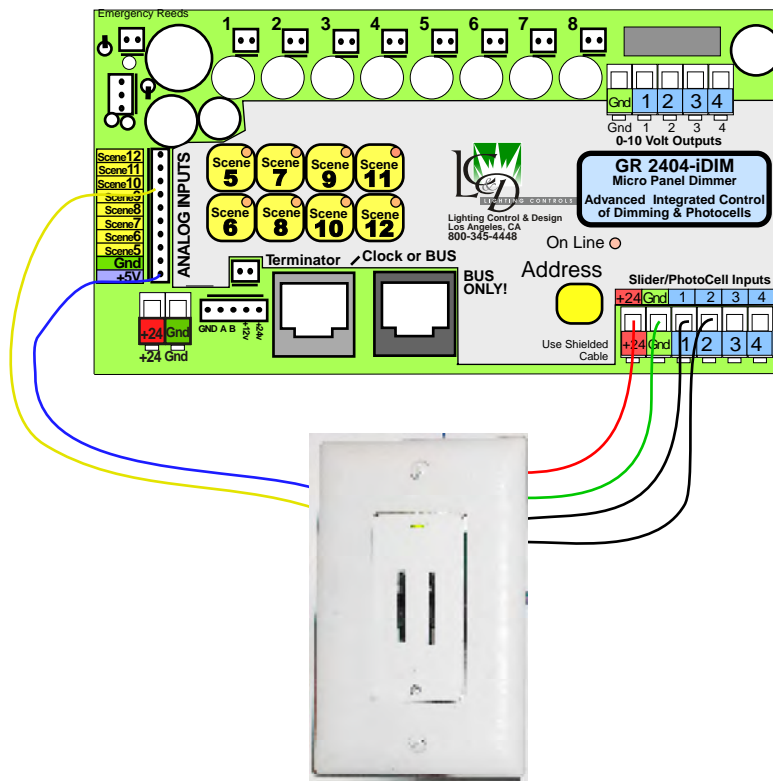


Hooking up Sliders

LC & D Offers slider switches in versions with 1 or 2 sliders in a Decora style face plate. They come in both Analog and Digital versions. The Analog version is shown below:

Sliders may be used instead of, or along with, photocells.

They may be wired directly into a GR 2404 iDIM.

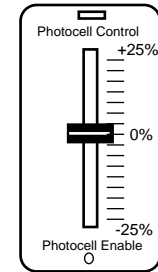


A 2 Position slider control with “Take Control” Button wired to the iDIM. Note that sliders or photocells are enabled using a scene.

Override Sliders

An Override slider is specifically used with a photo-cell Scene to allow the occupants of the space to boost or cut the photocell **set** level.

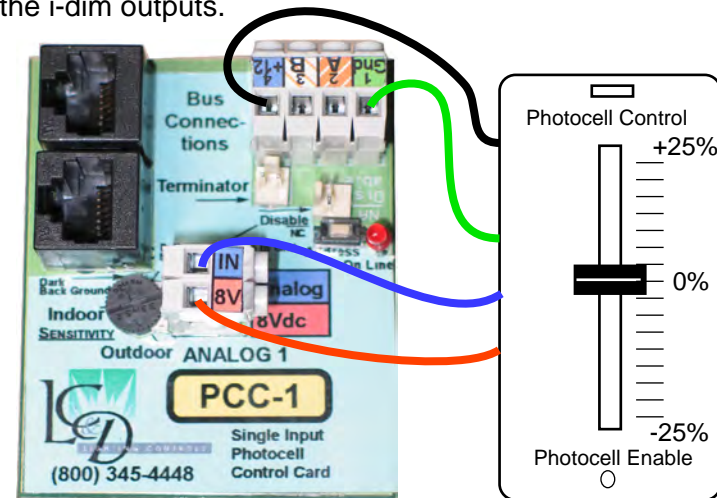
The face plate has been screen printed to show a boost or cut calibration. It is wired in exactly the same way as a slider. Please read the paperwork that came with the system to make sure that the correct scene is chosen for the slider.



LC & D Systems come pre-programmed from the factory with all the data that was to hand when the system was shipped. If any changes are needed the factory will program these for free as long as a modem or internet communication is set up.

Sliders over the Bus

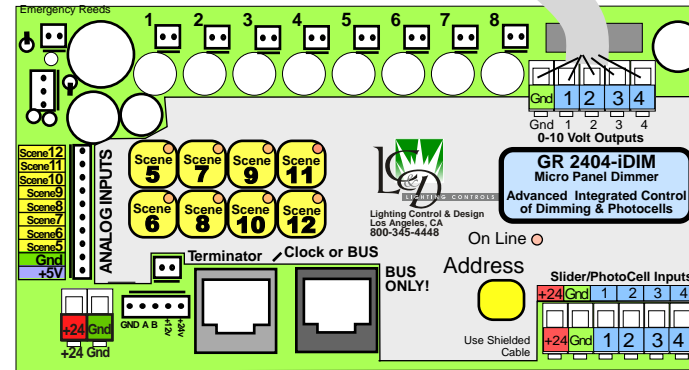
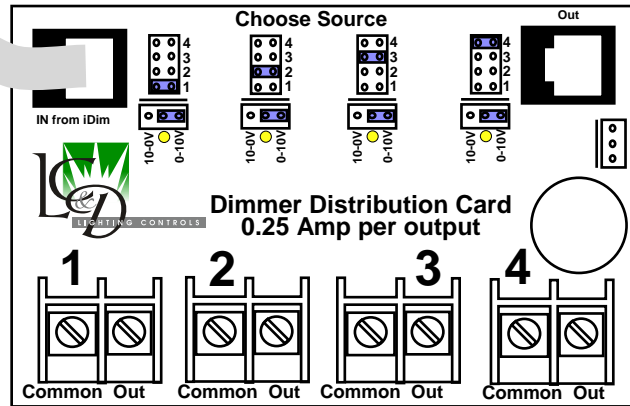
Sliders over the bus must be ordered with the correct order codes since they work at 12 Volts and not at the 24 Volts used with the i-dim outputs.



PCC1 with Override Slider-PCC

Dimmer Booster Card

RJ 11 (6 wire) Telephone type cable.

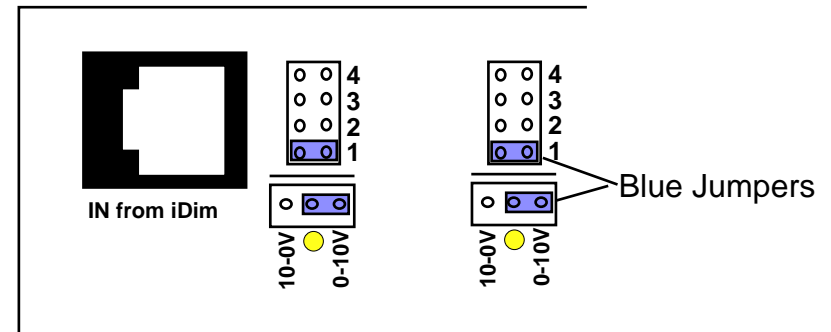


A dimmer Booster card is used when the 0-10Volt load is more than the 15 ma that the iDIM outputs are rated to handle. The 0-10 volt output is optically isolated from the electronics of the iDIM to ensure that any mis-wire on the high voltage end will not feed back into the GR2400 system.

For a system where a single GR 2404 iDIM is being used to turn ON and off contactors and the 0-10V signal is being used to control several hundred ballasts, a Distribution card is a must. It can feed up to 1/4 amp into each output which is a lot of ballasts.

Certain HID Loads require 5ma each and a signal that is inverted to 10 volts to Zero. Provision has been made for this and only requires the movement of a jumper.

The Dimmer Booster Card is powered from a separate transformer than the iDIM so as to maintain isolation. It comes in the same size of enclosure as an i-DIM.



Selecting a Source

Sometimes more than 250ma is needed on just a single channel. In which case the source jumpers can be moved so that more than one channel for instance is being fed from Dimmer # 1. To assist this multiple Dimmer Booster outputs may be run in parallel to give up to 1 amp out per dimmer. For more power an additional GR 2404-iDIM should be used with more Dimmer Booster cards.

Note About Programming: Though your system has been pre-programmed at the factory there are always changes to be made. Connect your system to a phone line and Lighting Control & Design will program it for you for free.

Programming the Micro Panel iDIM and iDH

Since the Micro Panel iDH is a sub set of the iDIM the rest of the manual will describe the iDim and only mention departures for the iDH. The Micro Panel-iDIM (MP-iDIM) sits on the GR 2400 Bus and appears to Clock Programmer as though it were a relay panel of 16 relays as opposed to 4 dimmers. Each combination of a Relay and Dimmer will be referred to in this manual as a CHANNEL. Thus Channel 1 is Physical Relay 1 plus Dimmer 1.

The relays in the Clock programmer REPRESENT the 4 channels and 12 scenes that can be programmed and accessed over the bus.

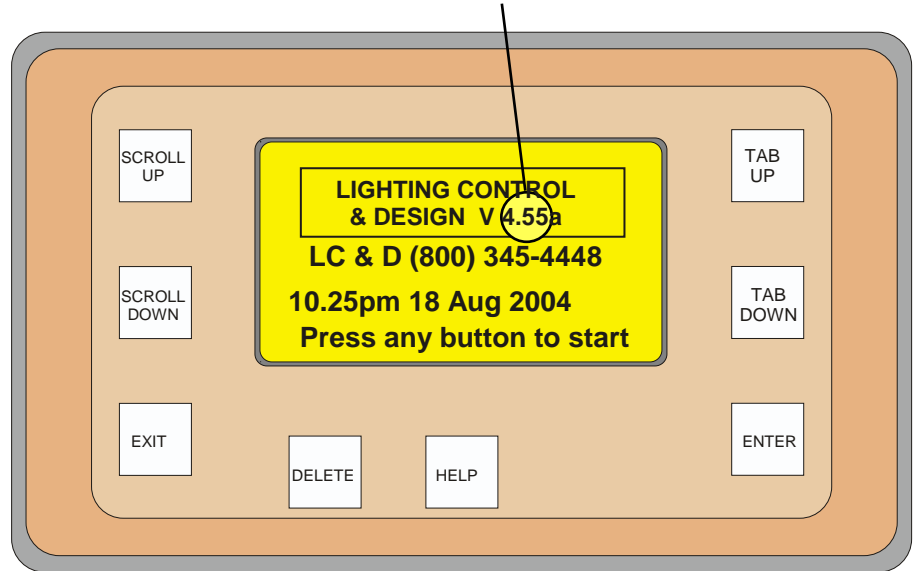
Adding an MP-iDIM to an existing Bus.

If you are adding an MP-iDIM to an existing installation please call the Factory at 800 345 4448 for assistance in following these instructions. If you are already familiar with Factory set up procedures then you can do them yourself. Just remember the phone call is free and we really want to help you get this set up without wasting time.

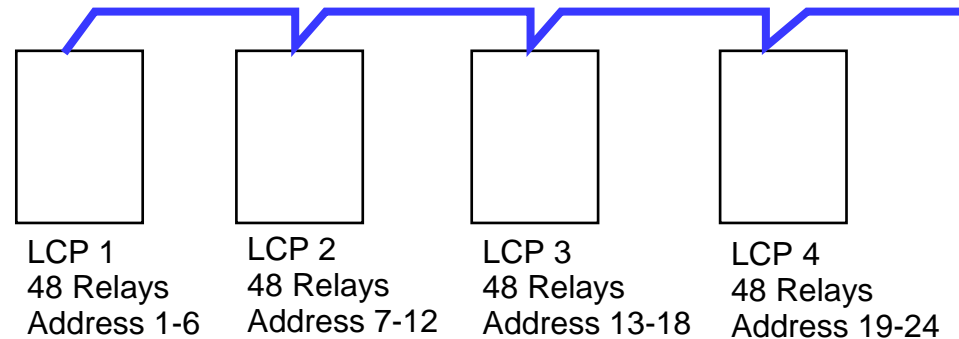
a) Make sure that the MP-iDIM is named as a 2 address relay panel in PANEL SWITCH TYPES. Lets say that there are 4 existing relay panels using up addresses 1 through 24 and that the switches are using addresses above 30. In this case one would add the MP-iDIM as LCP 5 at addresses 25 and 26. This is done in the RESTRICTED Menu.

To enter the Restricted menu put in the code: 90001.

Clock Version must be 4.55 or above



Once you are in the Panel/Switch Types Menu Scroll on the empty addresses of 25 and 26 to put in LCP 5 as a GR 2408 card in each location. See the next column for what the screens will look like:



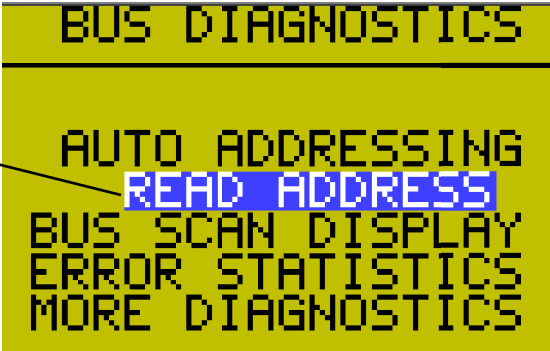
FACTORY SETUP MENU
 ADDRESSING BUS SCAN
PANEL/SWITCH TYPES
 RELAY PROPERTIES
 REMOTE SYSTEM MENU
 OWNER SETTINGS
 ERASE OPTIONS

ADDRESSING PAGE 4-19
 ID22 : 2408 as LCP4
 ID23 : 2408 as LCP4
 ID24 : 2408 as LCP4
 ID25 : 2408 as LCP5
 ID26 : 2408 as LCP5
 ID27 : UNUSED
 ID28 : UNUSED

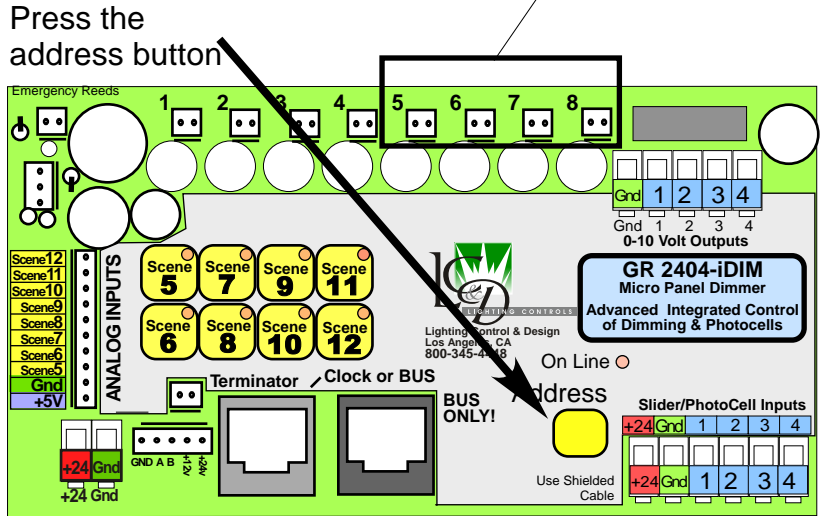
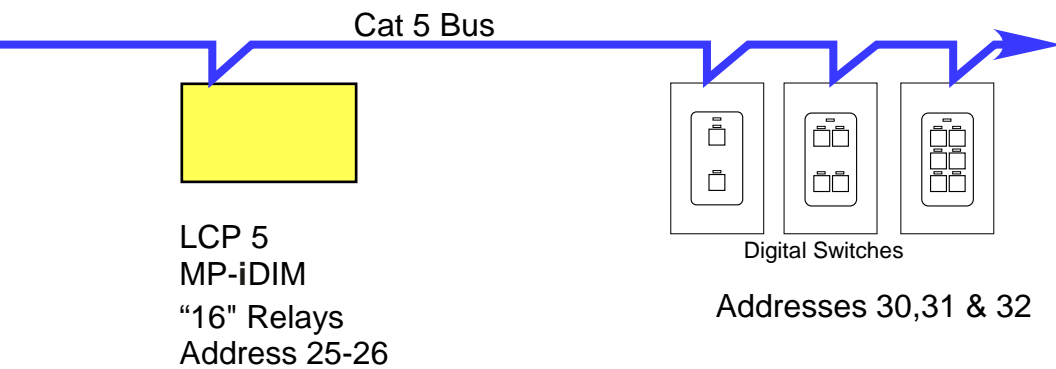
Addressing the MP-DIM

Usually the MP-iDIM has been pre-addressed at the factory. It is a good idea to check that the address is the one that it says it is and that this does not conflict with any other item on the bus.

Use the ADDRESSING/BUS SCAN Menu as shown above in the Factory Setup page of the Restricted menu. Use READ ADDRESS and with the MP-iDIM on the Bus press the address button. The address will read back on the screen. Note that one can unplug the clock from the Master Panel and plug it right into the MP-iDIM .



Note: Relays 5-8 do not have dimmers associated with them. These are "special feature" relays that are **NOT** visible in the manual control screen. They are only accessible through scenes.



Programming the MP-DIM.

Although there are only 4 Channels there are 16 relays observable in the MANUAL CONTROL screen. Each relay is used to REPRESENT a different function as shown below. The numbering of the relays is 1 through 16 as though this were a 16 relay panel.

Note: The control card has outputs for 8 relays. Relays 5-8 are “added feature” relays that were not available on early designs. These relays switch only, they have no dimming outputs and are ONLY available if programmed into a scene. They are covered in more detail later.

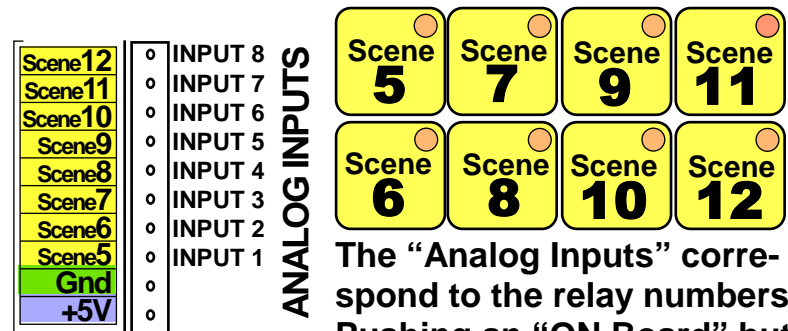
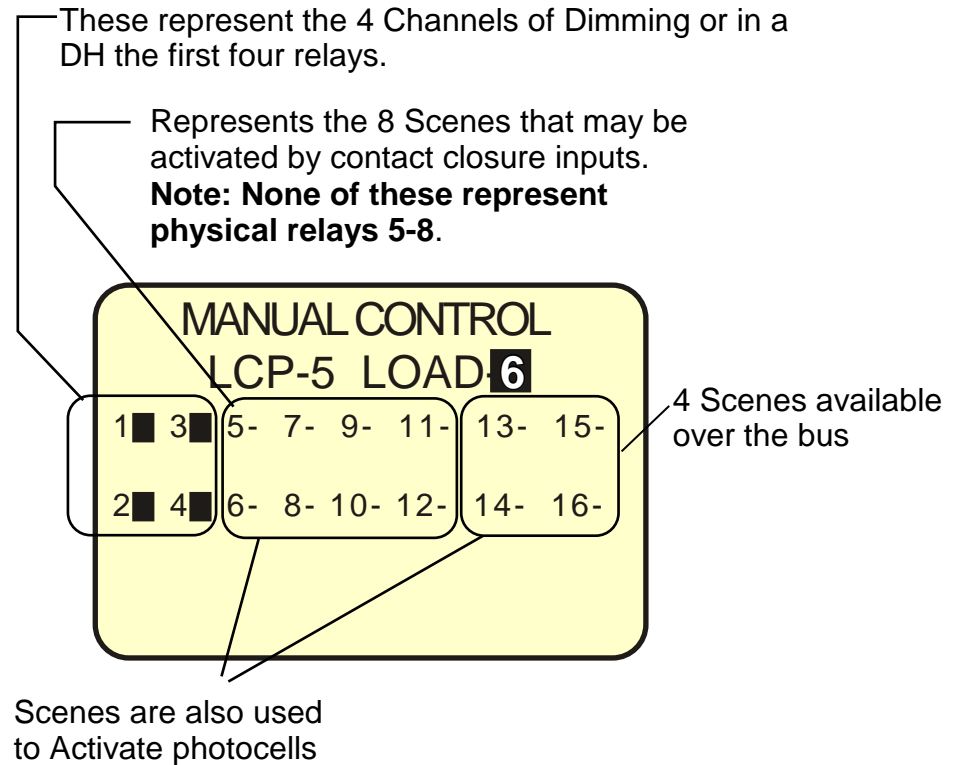
a) Relays 1 through 4. These represent the ON/OFF function of the 4 Dimmers. These can be considered as Special scenes with one dimmer in each.

b) Relays 5-12 represent preset scenes that may be switched over the bus or by using the “Analog” Inputs. These Scenes are the ones most likely to be used with Occupancy sensors. Scenes may also be used to activate the photocells or sliders. A dimmer within a scene may be set to a preset level or to follow a particular photocell. The same dimmer or dimmers may follow different photocells or sliders in different scenes.

d) Relays 13-16 are available as scenes ONLY over the bus. They may also be programmed as “Raise” or “Lower” buttons. Since they do not have an analog input associated with them they may only be used with an Occupancy sensor that is wired to a digital input on a “DigiLink” Dry Contact input card.

Scene Numbering

Scenes are represented by Relays. In order to simplify programming the Scene numbers are the same as the number of the relay that represents it.



The “Analog Inputs” correspond to the relay numbers. Pushing an “ON Board” button is the same as pressing a button on a remote switch. **Note: The On Board buttons will not be available on some newer control cards.**

Setting up the iDimmer or iDaylight Harvester is done in the Relay Properties Menu

Relay Properties exist in two locations in the Clock. First in the FACTORY SET UP MENU and also in the non restricted area in the SET UP Menu.

The first step is to define if it is an iDIM or an iDH. This is usually done already by the factory but is documented here.

USER MENU/SETUP MENU/RESTRICTED/

FACTORY SETUP MENU
 ADDRESSING BUS SCAN
 PANEL/SWITCH TYPES
RELAY PROPERTIES
 REMOTE SYSTEM MENU
 OWNER SETTINGS
 ERASE OPTIONS

USER MENU/SETUP MENU/

SETUP MENU

 RESTRICTED
RELAY PROPERTIES
 SCHEDULE PROPERTIES
 SYSTEM SETUP MENU
 (SET THERMOSTAT*)

* Only if T-Link is on the bus

Once in the Relay Properties Menu one has to choose the correct board for the MP-iDIM. Note that an MP-iDIM has two addresses associated with it. The one at the first address is relays 1 through 8 and the one at the second address is relays 9 through 16.

In the example we have been using the -iDIM is LCP 5 at addresses 25 and 26. This will show up as boards 25 and 26 in the Relay Properties menu. **We are only interested in the board at the first address**

RLY PARAMs PAGE 5-5
BOARD 25 Dly 0
 BOARD 26 NA

Note: The delay value sets the level to which a dimmer dims when "Blinking the lights. This would usually be left at 0. The relay output does NOT open when in Dimmer mode.

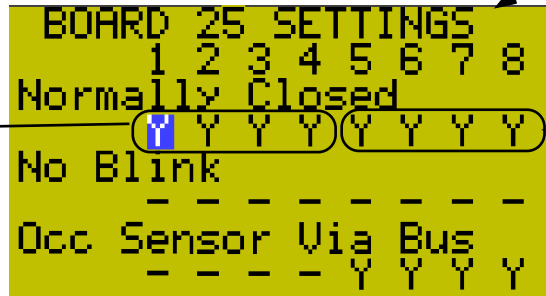
Pressing ENTER on a highlighted board number takes one to the SETTINGS Menu that looks like this:

```
BOARD 25 SETTINGS
 1 2 3 4 5 6 7 8
Normally Closed
  Y Y Y Y Y Y Y Y
No Blink
  - - - - - - - -
Occ Sensor Via Bus
  - - - Y Y Y Y
```

"Board 25 Settings" Blinks back and forth with the board "Version number"

Relay Properties: SETTINGS Screen

First 4 relays define if its a Dimmer or a Relay and must be set first.



This line toggles back and forth with the version number of the Control Card



In this case 5-8 does set Normally Open or Normally Closed for the physical relays 5-8. This is the ONLY property set here for these relays. All other properties refer to SCENES 5-8

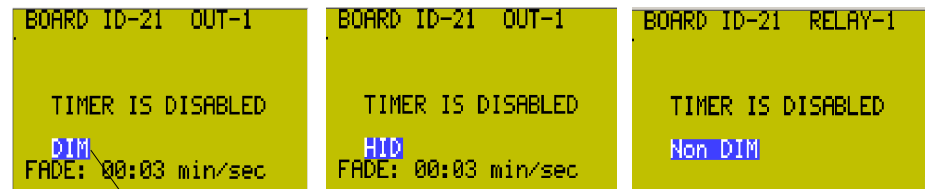
Normally Closed refers to the type of relay that is attached. It is only relevant for the first 8 channels. Note: In this case setting Normally closed for relays 5-8 DOES refer to the physical relays 5-8 but this is the ONLY property set for those relays in this screen. To set the Channel parameters highlight a number as shown and press ENTER.

This is the screen where one sets the three possible types of output for an iDim/ DH card.

Dim means it is a dimmer.

Non Dim means it is a Relay output and the **HID Setting** is used for dimming HID Ballasts. It prevents the relay from turning OFF when dimmed to zero to prevent having to restart the 15 minute warm up period. See page 52 for programming switches to control HID

As shown for RELAYS 1-4



DIM
HID
NON DIM

If all four outputs 1-4 are set to Non Dim then the card becomes a DH card. Even one output set to dim means it is a dimmer.

Dimmers get to set additional parameters by pressing ENTER when Dim is High-Lighted

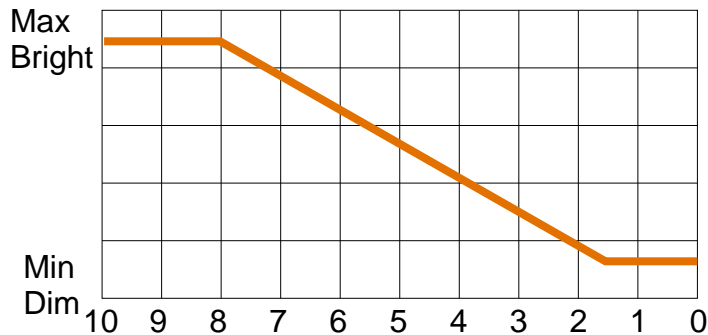
The TRIM Menu

```
Trim menu - DIM1
Low trim: 0
High trim: 1000
Dim output when level
is zero: Zero
```

Fluorescent Dimming ballasts do not use the full 0-10 Volt range. They usually start dimming at about 8 volts and stop dimming when they reach 1.5 volts. Thus to get the full range out of the dimmer it is sometimes necessary to set the trim

```
Trim menu - DIM1
Low trim: 150
High trim: 800
Dim output when level
is zero: Trim Low
```

150 = 1.5Volts
800 = 8.00 Volts



There is one more parameter that may be set. This is the output level when the relay is OFF.

Each dimming Channel has two outputs. The Relay and the 0-10Volt output. If the trim is set to above zero one may leave it at this level even when the relay is off. Alternatively one may designate that if the relay is OFF the output must be zero. This is most useful for phase controlled dimming when one may want the low end to have a trim but it must be in the off position if the relay is OFF. The reason for this is that sometimes a relay is not used with phase control dimming and the triac will cause the filaments to ring when the load is supposed to be OFF.

Dimmer timers

```
BOARD ID-21 OUT-1
TIMER ENABLED
DIM
FADE: 00:03 min/sec
```

Scroll on "TIMER IS DISABLED" to "TIMER ENABLED" and press "ENTER."

Note that the timers on the first 4 relays apply to the relays themselves and are most often used when the output is a NON DIM relay rather than a Dimmer.

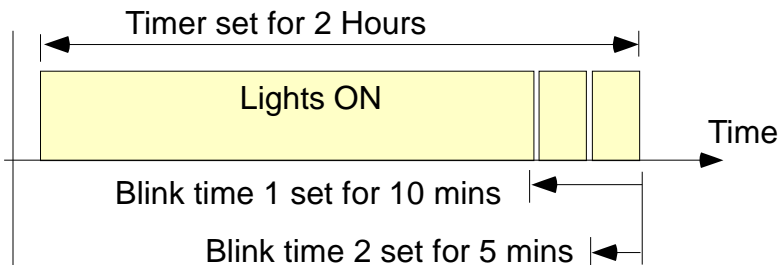
```
TIMER SETTING
HORN DRIVER MODE: NO
REGULAR TIMER MODE
02:00:00 H/M/S
Blink One: 05:00 M/S
Blink Two Disabled
```

The TIMER SCREEN

The Timer screen is exactly the same as that used on relay cards and thus has the possibility of being used as a Horn Driver output. There are the following timers:

- 1) Overall Timer
- 2) Blink Timer 1 (Time Back from timer end to blink.)
- 3) Blink Timer 2 (Usually set to half Blink 1)
- 4) Horn Drive 1 (Time in seconds from Start of Blink that the horn output will stay ON.
- 5) Horn Drive 2(Same as above starting at Blink 2)

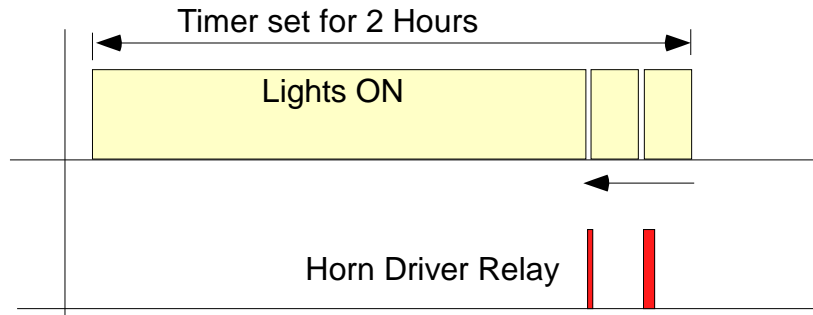
Note that when setting a timer on a relay it works as shown below: Blinks do not have to be set. Exiting out to the previous scene set the “No Blink” field to Y.



Horn Driver Mode

One would not use relays 1-4 with the horn driver unless they were set to Non Dim. DIM outputs do not actually turn the relay off during the blink warning so would not work. The Horn Driver may be used with relays 5-16 as described below:

When a relay is set to horn driver it is specifically expected that the load is a horn or that a Chelsea switch with a beeper on it is looking at this output. The idea is that the horn only sounds when the “Blink warning” occurs. At all other times the output is OFF.



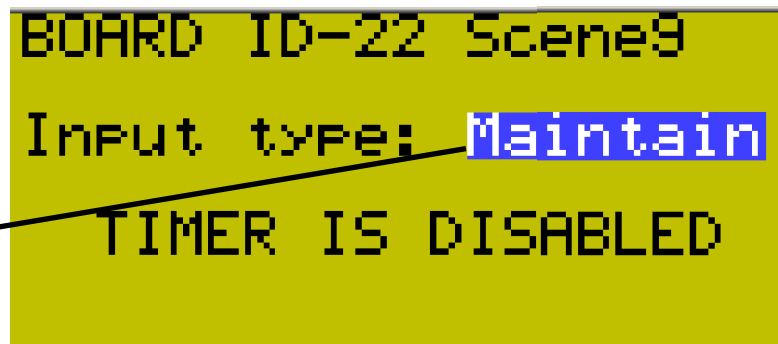
```
TIMER SETTING
HORN DRIVER MODE: YES
REGULAR TIMER MODE
02:00:00 H/M/S
Blink One: 05:00 M/S
Blink Two: 02:00 M/S
Horn One: 1 sec
Horn Two: 4 sec
```

The length of time the horn sounds can be set for up to 255 seconds.

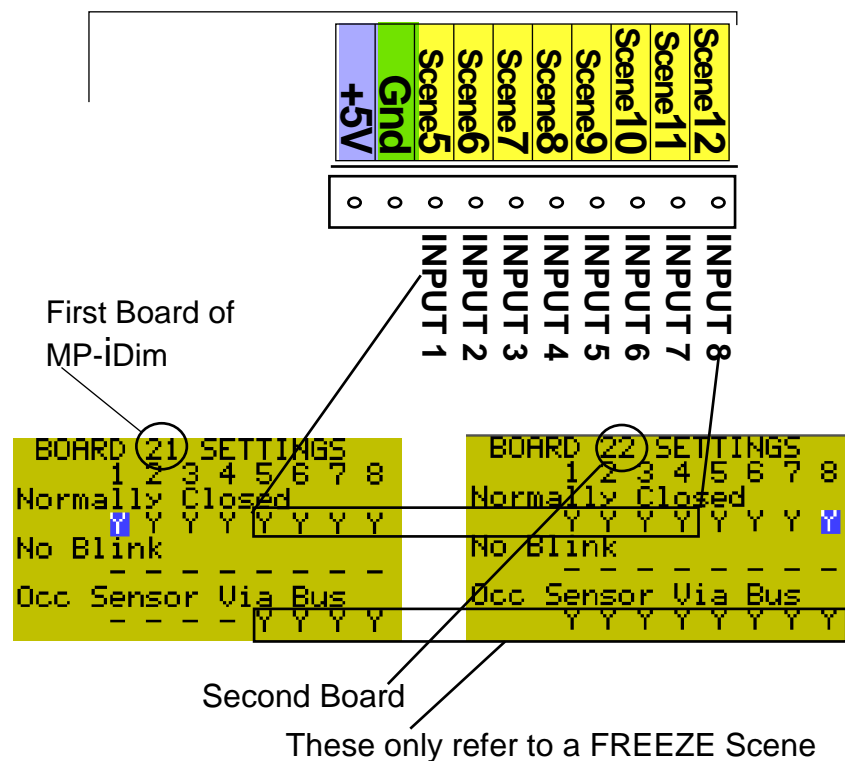
Analog Inputs

The “Analog” or contact closure inputs of the MP-iDim are associated with the first 8 Scenes of the panel. They are used for hard wired control.

The function of the input: Momentary, Toggle or Maintain is programmed in the Relay Properties for that Relay/Scene. Channels 1-4 can only be accessed via a scene using the Analog (contact closure) Inputs



ANALOG INPUTS

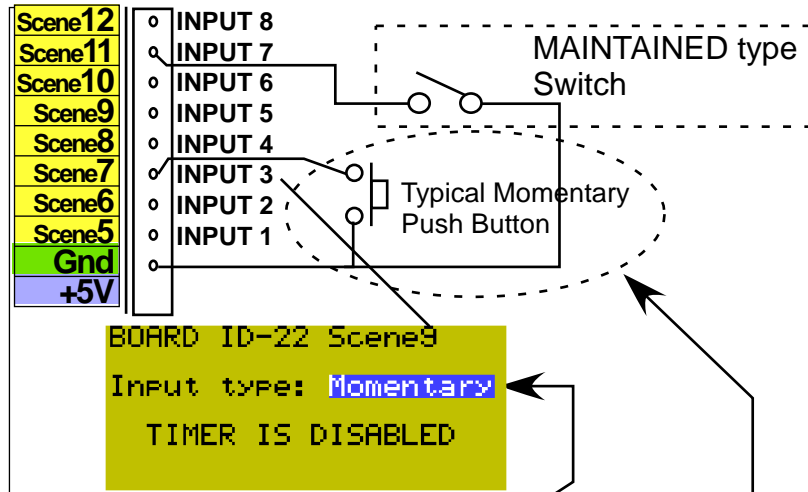


Note that in earlier versions of the Control card the first 4 inputs were associated with the first 4 relays/Dimmers. If you are familiar with earlier versions this is a change.

One may still access a single output via a scene. Just program that single output to the scene and operate the Scene instead.

This feature was added when the number of loads controlled was increased from 4 to 8. The last 4 outputs are available as relays only and can **only** be controlled by first putting them inside a scene.

How to Program inputs on Relays 1-8



```
BOARD ID-22 Scene9
Input type: Maintain
TIMER IS DISABLED
```

If the input type is **MAINTAINED** then Use this style of switch.

Use MAINTAIN with an Occupancy Sensor controlling a SCENE type scene.

- On contact closure the dimmers will fade up to the Scene Settings. However if the dimmer is already in the ON position nothing will happen.
- On Contact opening the Scene and Loads will fade to OFF depending on the programming.

If the input type is **MOMENTARY** (default) Then use this style of Input Button

Note: If the Scene is an PROGRAM Scene one MUST program the input to be MOMENTARY for it to work with the following features.

- A **Tap** (less than 330ms and more than 75ms) fades the outputs to the Program Scene.
- A **double tap** results in a jump to the Program Scene Setting.
- A **push and hold** for more than 10 seconds puts current settings into Scene Memory.

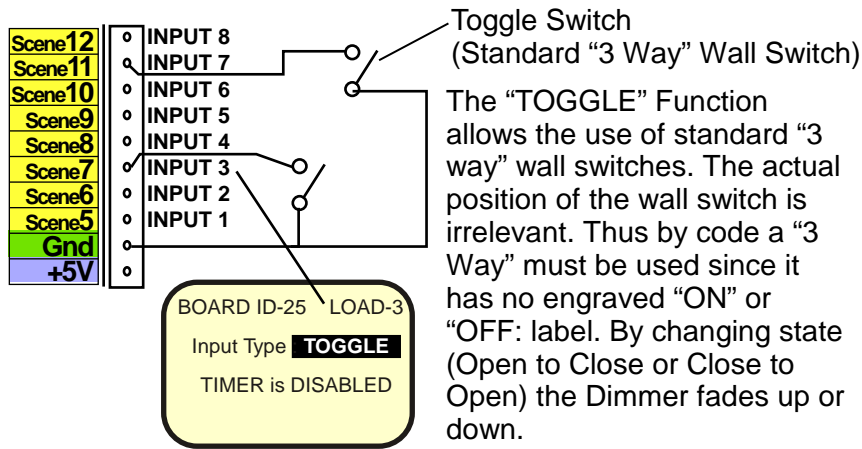
MAINTAIN and TOGGLE should not be used for PROGRAM mode.

If the Scene is in "SCENE" Mode then the "Momentary" input will work as an alternate action switch. First push turns ON the scene and the Second push turns it off.

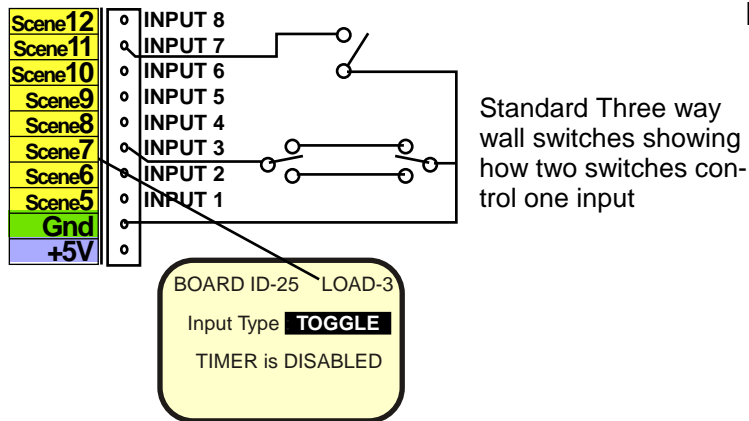
RAISE and LOWER Scenes use MOMENTARY Contact closure inputs too.

TOGGLE is discussed on the next page.

Using "Toggle" with a "3Way" Wall Switch.



3 Way Switches used as a 3 Way" and the TOGGLE Mode



Note: For the Toggle mode to work for a Scene it will have to be in the "SCENE" Mode.

This function is particularly useful for the Daylight Harvest-er panel that uses Relays only.

This function also works for dimmers but it is best to set the fade rate fairly short such as 2-3 seconds

Other functions and iDH exceptions

These pages give a quick overview of the action of the "hardwired" inputs. The capabilities will be expanded on in the next few pages. It is a good idea to read all the pages on programming scenes and to then come back to the specific page to make sure that you have all the data.

NO AUTO ON.

Scenes 5-12 are associated with the contact closure inputs. These inputs are quite often used by Occupancy Sensors. A special function has been included for Occupancy Sensors that allows the "ON" command from an Occupancy Sensor to be ignored during certain parts of the day. This is explained further in the Scenes part of the manual.

iDH exceptions.

Since an iDH has relays and no dimmers there are some functions that are not relevant because relays just turn ON, OFF or are controlled by a photocell.

For instance in the iDH mode the Scene is called a "Relay Scene" shortened to "Relay Sn" to fit into the display. Relays may be designated as ON or OFF.

The TOGGLE command for the hard wired inputs is very effective and can save money by using inexpensive "3 way" type wall switches to control a load each time it changes status. It acts like a 3 way switch in that one does not know by its mechanical position if the light is ON or OFF. A "3 way" is required by code since it has no labels designating ON or OFF.

Memory Locations for each dimmer

Each dimmer has 13 memories associated with it. 12 of these are for the scenes and the 13th is called the “preset level”. It is associated with the first 4 relays in the Manual control screen.

This “preset level” is the only level that can be changed manually by button pushes. Once changed it may be loaded into a scene by pushing and holding a scene button (that is in PROGRAM Mode) for 10 seconds.

Action of the Buttons on the individual dimmers

Individual dimmers have some special features that are particularly useful for “residential” applications. A single button controlling these loads directly may access both the preset level and FULL ON by the use of Tapping the button. To program this on a digital switch (over the bus) the button must be in MAINTAIN mode.)

Buttons may be “Tapped” or “Held”.

A “Tap” is defined as push and let go on a button that is more than 75 mseconds and less than 330 mseconds long.

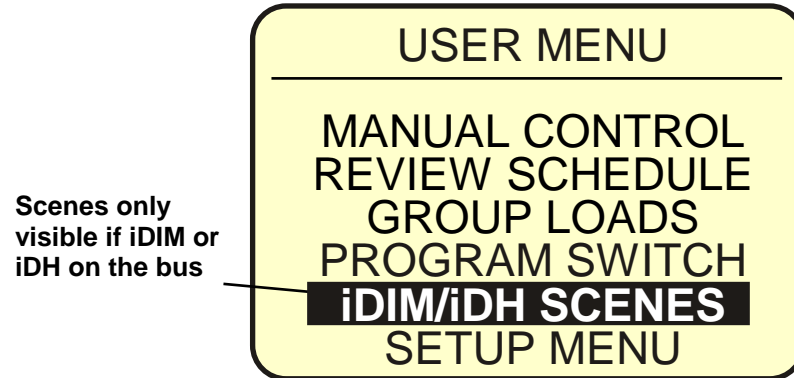
A “Push and Hold” is defined as being more than 330 mseconds (about 1/3rd of a second) long. PUSH and HOLD is used for Dimmer level setting and changes the fade rate to 1 volt per Second. This is sufficiently slow to be able to set an exact level.

A double tap is two taps within two seconds.

A single tap fades the output to preset. A double tap jumps the output to full ON.

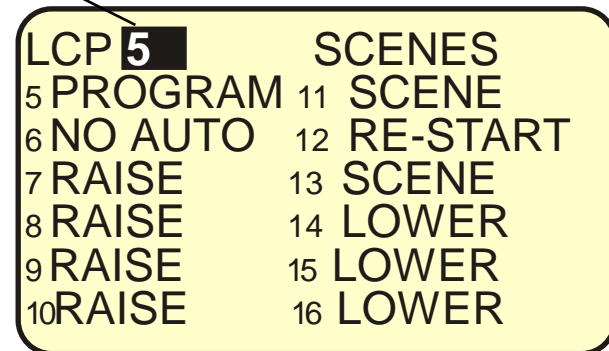
Programming Scenes

If there are iDIMs or iDHs on the bus the “USER MENU” has an additional item attached to it.



Press Enter when iDIM/iDH SCENES is highlighted to get to the Menu below: This has examples of some of the types of scene available. It helps to know what mode each scene is in without having to Tab to the Field and press enter to get the data.

Scrolling on the LCP number allows access to all iDIMs and iDHs on the bus.



Feature on Scenes 5-10

PROGRAM
SCENE (RLY SCN)
RAISE
LOWER
FREEZE
NO AUTO
ReStart
FLIP11*

*If Input 5= "FLIP 11"
If Input 6="FLIP 12"
If Input 7="FLIP 13"
If Input 8="FLIP 14"
If Input 9="FLIP 15"
If Input 10="FLIP 16"

| LCP 5 | | SCENES | |
|-------|----------|--------|----------|
| 5 | PROGRAM | 11 | SCENE |
| 6 | NO AUTO | 12 | RE-START |
| 7 | SCENE | 13 | RAISE |
| 8 | FREEZE | 14 | LOWER |
| 9 | RE-START | 15 | SCENE |
| 10 | FLIP 16 | 16 | SCENE |

Feature on Scenes 11-16

Scenes 13-16 do not have on board inputs so "No AUTO" is omitted

PROGRAM
SCENE (RLY SCN)
RAISE
LOWER
FREEZE
ReStart

A Quick Overview of the types of Scenes. See later for Programming details.

A PROGRAM Scene allows the values of the scene to be programmed in the field. It also allows for two fade rates, the preset fade rate and the Jump fade rate. The Jump fade rate is accessed with a double tap while the programmed fade rate is accessed with a single tap.

Digital switch buttons controlling a PROGRAM scene must be programmed as "MAINTAIN". MAINTAIN is the only function that looks for both the contact closure and the contact opening of the push button. To store data into memory, hold down down for 10 seconds or more.

"SCENE" scene (iDIM only)

This mode does not allow the setting of the scene to be changed but is more flexible in the way that switches work. One can use a switch in Toggle, ON, OFF or Maintain mode. The double tap feature with two fade rates is not available in this mode.

RELAY SCENE (Displayed as RLY SCN.) (iDH Only)
This mode is used for iDHs and one can set a relay ON, OFF, Photocell (PC) or ignored (N/A).

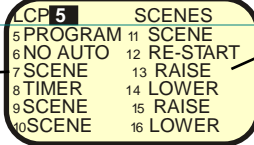
FREEZE Scene: The purpose of this scene is for a "Quiet Time" override in a School Classroom. The idea is that the students will be so still the Occupancy sensor will time out. This is unlikely but should it occur the FREEZE scene takes care of it. The action of the FREEZE Scene is to ignore inputs from OCC Sensors or photocells for the scene designated and for the time shown then it releases.

NO AUTO ON (Displayed as NO AUTO) (iDIM and iDH)
This mode is only available on Scenes 5-12 which have hard wired inputs associated with them. It is for use with Occupancy sensors. The relays associated with that scene (relays 5-8 of the first board and 1-4 of the second board) determine if the ON command of the Occupancy Sensor works. If the relay is ON the Occupancy Sensor works normally. If the relay is OFF then the ON Command from the Sensor is ignored. The OFF command always works even if the scene has "dropped out." (Explained Later.)

Feature on Scenes 5-10

PROGRAM
SCENE (R/LY SCN)
RAISE
LOWER
FREEZE
NO AUTO
ReStart
FLIP 11*

*If Input 5="FLIP 11"
If Input 6="FLIP 12"
If Input 7="FLIP 13"
If Input 8="FLIP 14"
If Input 9="FLIP 15"
If Input 10="FLIP 16"



Feature on Scenes 11-16

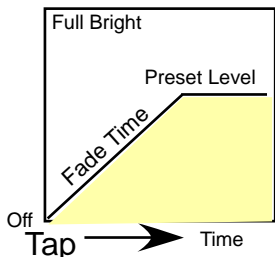
Scenes 13-16 do not have on board inputs so "NO AUTO" is omitted
PROGRAM
SCENE (R/LY SCN)
RAISE
LOWER
FREEZE
ReStart

RAISE (ON)/ LOWER (OFF) (iDIM Only)

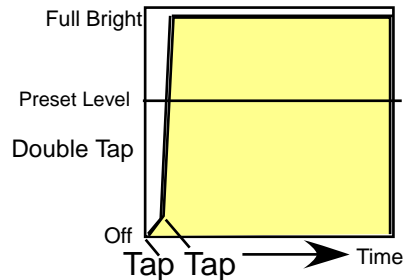
Raise Mode may be used with Scenes in the PROGRAM Mode to set the level before storing into a Memory. It may also be used as a "All ON" type of button.

Digital Switches (working over the bus) must be programmed in MAINTAIN Mode for RAISE/LOWER. In RAISE Mode a single Tap fades to the Preset Level. A second tap once at preset will fade to full bright. A double tap from less than full bright including OFF will Jump the level to full bright. PUSH AND HOLD will change the level of the preset for that Dimmer or dimmers. Lower works the opposite way.

A RAISE Scene may not be used when programming an ALL ON that includes relays from a relay panel. (Since the relay panel needs a momentary control and the Dimmer panel needs a MAINTAIN control.) Use a SCENE Scene and program an ON or OFF button.



Single Tap



Double Tap

Raise/Lower Continued: There are additional features available with Raise and Lower. "Tap Jump" allows one to raise or lower by a percentage of dimming for each tap from 1 through 25%. Raise/Lower may also be associated with a scene in which there are photocells. This prevents the Raise from exceeding the photocell setting.

Re-START Scene (iDIM Only): This mode is specifically for when photocells are used. It will re-establish photocell control if the photocell has been over-riden and the level is higher than the photocell says it should be. A timer is specified as to how frequently this should be done. If the level is lower than the photocell says it should be then nothing happens. If within this same scene a dimmer is set to a specific level, such as 50% that level is not re-established on the timer. An additional feature called "Re-iterate" does force set levels to be re-established with the timer.

For Inputs 5-10 ONLY "FLIP(X+6): This allows for two scenes to be operated by the Occupancy Sensor. There are two modes available. "Input" mode means that on contact closure the first Scene such as 5,6,7,8,9, or 10 is operated and on contact opening the second scene (11,12,13, 14,15 or 16) is operated. This is used when one wants to leave the lights at a certain level on leaving an area.

The other mode is RELAY mode. In this case the virtual relay which is associated with Scene 5-10 determines which scene is operated on. If it is ON Scenes 5-10 operate, if OFF Scenes 11-16 operate. The full programming is explained later.

PROGRAMMING SCENES

Changing the MODE of a SCENE

To change the mode TAB down to the Scene in Question and then scroll on that field. Stop on the Mode that is needed.

| LCP 5 | | SCENES | |
|-------|----------------|--------|----------|
| 5 | PROGRAM | 11 | SCENE |
| 6 | NO AUTO | 12 | RE-START |
| 7 | RAISE | 13 | Relay Sn |
| 8 | RAISE | 14 | LOWER |
| 9 | RAISE | 15 | LOWER |
| 10 | RAISE | 16 | LOWER |

PROGRAM SCENE

Scroll Field
100%
99%
...
0%
N/A
(ON) (Relay)
(OFF)(Relay)
PC

| BOARD 25 SCENE 5 | | | |
|------------------|--------------|---------|-----|
| DIM 1 | 60% | Rly 5 | N/A |
| Rly 2 | ON | Rly 6 | N/A |
| DIM 3 | 80% | Rly 7 | N/A |
| DIM 4 | 100% | Rly 8 | N/A |
| FADE | 00 03 | min/Sec | |
| OVERVERRIDE | N/A | | |

Scroll Field
ON
OFF
PC

Pressing ENTER on the Program Scene gets to the menu above.

The choices for each field are shown on the left and right. A dimmer may be set to a percentage or may follow a photocell. One generally does not use the PROGRAM scene for photocell actions.

Notes on A PROGRAM Scene.

A) A program Scene is specifically designed for use in Architectural and Residential “traditional” dimming application. Usually the levels set on the screen will be altered in the field with a push and hold override. Relays in a PROGRAM Scene may be designated as ON or OFF or Not Applicable. (N/A).

B) The Switch Button controlling a program scene is programmed as a MAINTAIN switch. This is so that the push and hold feature will be noticed. Programming the button as a ON or Toggle may work occasionally but is inconsistent. DO NOT program them this way.

C) Since the scene is re-programmed when one “Pushes and Holds” for more than 10 seconds this is not the scene to use with an Occupancy sensor.

D) The PROGRAM Scene ONLY operates when one lets go of the button, not on pushing the button. The reason being that the length of the button push has significance. Thus until the button is released the system does not know what the command is.

E) The PROGRAM Scene also uses the double tap feature. A single tap takes the levels to the programmed scene at the programmed fade rate. A double tap goes to the programmed levels instantly.

F) The ONLY way to turn off a PROGRAM Scene is with another scene or all off.

The Override feature should be left at N/A. It is explained under the “SCENE” Scene.

Programming a "SCENE" Scene

"No Timer" refers to Occ Sensors. See NO AUTO explanation

Shows Relay 2 was assigned as a Non Dim in RELAY PROPERTIES MENU but because other channels were assigned as dimmers this is a Dimmer Card.

```

BOARD 25 SCENE 6
NO TIMER
DIM 1 60% Rly 5 N/A
Rly 2 ON Rly 6 N/A
DIM 3 PC Rly 7 N/A
DIM 4 PC Rly 8 N/A
FADE 00:03 min/Sec
Override N/A
    
```

Press ENTER to jump by 10

Scroll Field
100%
99%
...
0%
N/A
(ON) (Relay)
(OFF)(Relay)
PC

N/A (Not Affected) means that Dimmer/Relay not affected by this scene

If Non DIM (DH Panel) Only these 4 Choices available

Fade Rate

Fade rate is set in Minutes and Seconds up to 99mins and 59 seconds.

This fade rate only applies to the scene. The dimmers within the scene may have their own fade rate if controlled individually but for the scene they all respond at the rate set.

Note this is a Fade **RATE** and not a Fade TIME. The rate is the time it takes to go from Zero to 10 Volts. Thus to go from 1 volt to 2 volts it will take 1/10th that time.

Override

This is specifically to raise or lower the settings of dimmers under photocell control. Any on board photocell/slider input may be used. They will be listed as IN 1 through IN 4. Alternatively a digital slider switch will show up at the address of the switch. The slider may then be used to boost or cut the photocell curves set in the scene to make the room

Override Active Screen

```

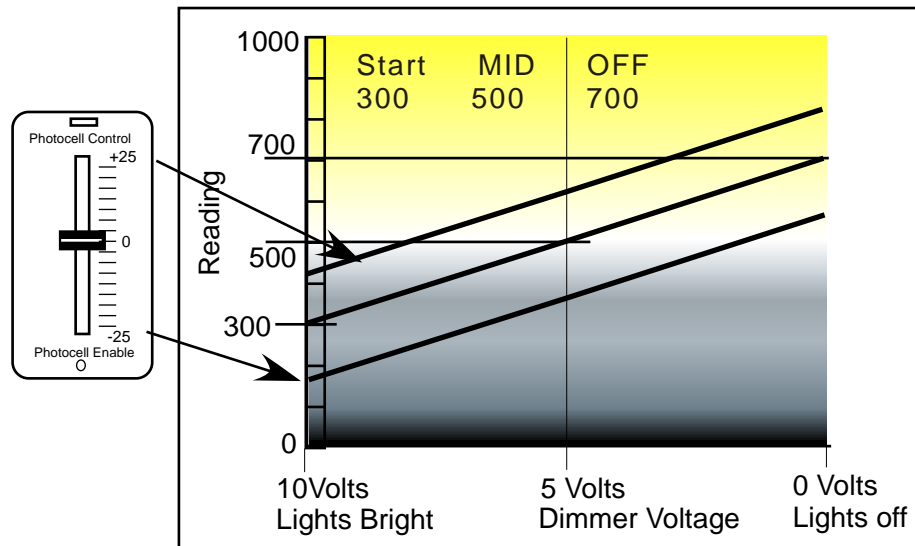
BOARD 25 SCENE 8
NO TIMER
DIM 1 60% Rly 5 N/A
Rly 2 ON Rly 6 N/A
DIM 3 PC Rly 7 ON
DIM 4 PC Rly 8 N/A
FADE 00:03 min/Sec
Override ID26-3 +/- 25
    
```

Scroll Field

N/A
In 1
In 2 — On board INputs
In 3
In 4 — PCC-1
ID 25
ID 26-1
ID 26-2
ID 26-3 — PCC-3

Note: Override only acts when Scene is ON.

brighter or darker as the occupants prefer. The number on the right is the boost or cut amount in the scale of the photocell curve.



Note: The Override is looking at a photozell input. The Photozell puts out a voltage of 10 for dark and 0 for very bright (1000).

The Override slider is set up to put out 5 volts at the center position and then adds or subtracts from the level depending on the way the slider is moved.

It is possible to take a spare dimmer output and feed it back to the 0-10volt input and use this to raise and lower the override. BUT please note the following.

- A) The isolated ground of the 0-10V out will now have to be common with the Bus Ground.
- B) Because the Photozell inputs are 10-0V as opposed to 0-10 volt logic one should use a RAISE button to reduce and a LOWER button to increase the amount of light.

Controlling SCENE type Scenes

The SCENE type scene is the most powerful programming tool in the whole of the GR2400 system. It has so many features it takes several pages to explain them all.

This Scene like the others is emulated by the action of a relay. Unlike the PROGRAM Scene it does not need to be controlled by a switch button in a special way.

It can be controlled by buttons that are TOGGLE, ON, OFF or MAINTAINED. Additionally the relay that emulates a SCENE Scene can be added into the list of an ALL ON or ALL OFF button or Group controlling not only dimmers but relays in GR 2400 Relay panels.

SCENE scenes have no problem being added to groups, they can be blinked and have their own timers that are accessed in relay properties. Multiple SCENE Scenes can have different timers while containing the same relays or dimmers. Thus dimmers or relays in, say, scene 9 can have a timer of 15 minutes while the same dimmers or relays placed in, say, Scene 10 can have a timer of 2 hours.

It does not come up very often but is nice to know.

Setting Photocells

```

BOARD 25 SCENE 8
NO TIMER
DIM 1 PC Rly 5 PC
Rly 2 ON Rly 6 N/A
DIM 3 PC Rly 7 ON
DIM 4 PC Rly 8 N/A
FADE 00:03 min/Sec

Override N/A
    
```

ENTER

Current reading

```

BOARD 25 Sn9-Dim4
Pcell IN 1 =70
Fade UP 0:10 Min/sec
Fade DN 0:20 Min/sec
Start MID OFF
100 400 1000
Time Out from OFF 03:00
MUST Turn ON @ 800
OFF
END
    
```

Scroll Field

| | |
|---------|--------------------|
| In 1 | On board Inputs |
| In 2 | |
| In 3 | |
| In 4 | |
| ID 25 | PCC-1 |
| ID 26-1 | PCC-3 |
| ID 26-2 | |
| ID 26-3 | |

A dimmer or relay in a scene may be set to "PC" or photocell control . Press ENTER on the field to get to the photocell menu.

The Scroll field for the photocell that controls this dimmer can be one of the 4 ON Board inputs, IN 1 through IN 4 or up to 48 Inputs from photocells on the bus. **The addresses of the Photocell Boards MUST BE in sequence.** If there is a gap in the addresses then additional photocells will be ignored by the dimmers on the bus. These photocell cards on the bus may also be used to trigger relays in ordinary relay panels.

Though only 16 addresses may be polled, each address may have 3 photocells on a PCC3 card. Thus up to 48 Global photocells are available on the bus.

FADE UP/FADE DOWN

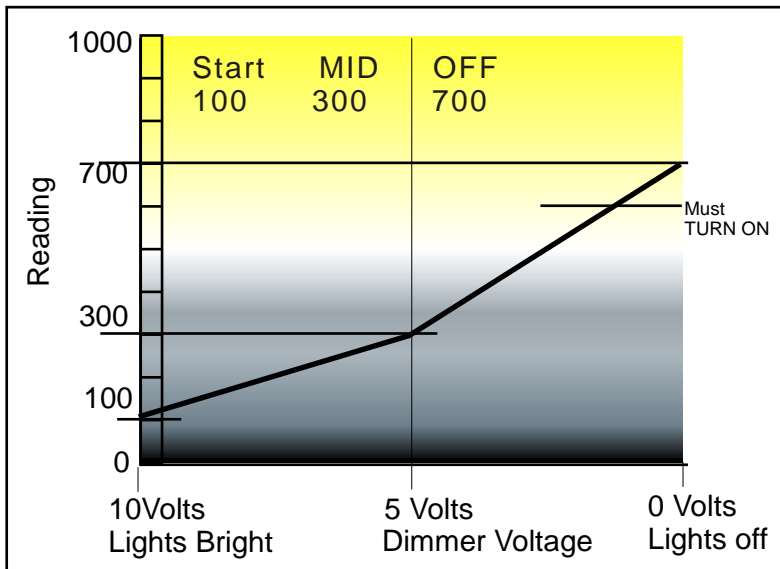
The fade rate as the Brightness of the lights increase or decrease may be set separately. Usually the Fade UP time is set to be shorter than the fade down time to account for the differing receptivity of the eye.

Note: The Scene has a separate fade rate which is the "first turn on" fade rate. Thus after initiating the Scene that enables the photocells the fade rate to the target point is 3 seconds rather than 20.

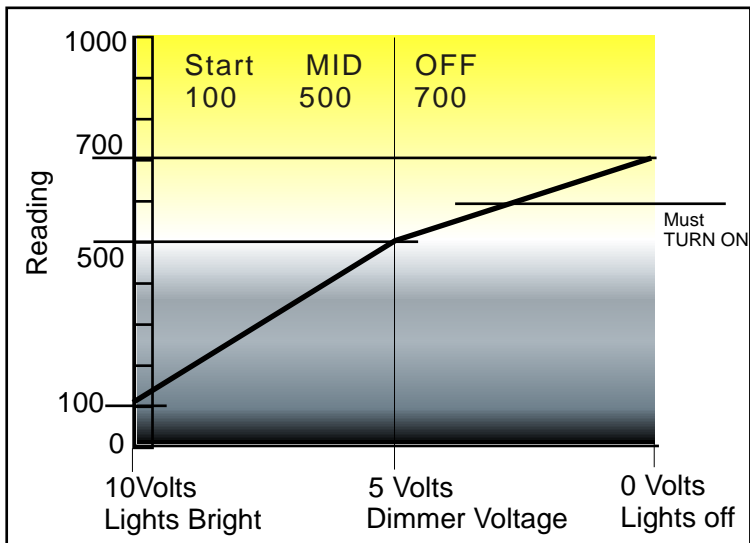
Setting the Curve.

There are three points that may be set on a follow photocell curve.

- The Start point. If the light is lower than this Start point no dimming will occur. This prevents dimming lights at night when using the Photocell in a closed loop situation.
- The OFF/END point. This is the point at which there is so much ambient light the dimmed lights should be turned off. Note that a Dimming ballast at minimum level is using about 30% of the power of Maximum level. This significant energy use can be saved by turning the lights off completely. That said, some clients want the lights to only go to Minimum DIM. In order to accommodate this the word "OFF" may be scrolled to "END." This just means the end point of the dim curve but lights do not go off.
- The Mid point. This allows for shifting the speed of the curve at one or other end of the spectrum.



This is how the settings on the previous page would graph. The Lights do not start to dim until the photocell reads 100. The lights dim on a straight line curve until the photocell reads 300 by which time the output volts is down to 5 volts. From this point the reduction is slowed down until it reaches the off point of 700. A different curve is shown below:



```
BOARD 25 Scene 8
Pcell IN 1 =70
Fade UP 0:10 Min/sec
Fade DN 0:20 Min/sec
Start MID OFF
100 300 700
Time Out from OFF 08:00
MUST Turn ON @ 600
```

TIME OUT & MUST TURN ON

The TIME OUT from OFF is the time after the dimmer has turned off before it may turn

ON again. Furthermore if the light level exceeds the off level and then drops down below the off level it must stay there for the Time Out period before the lights switch ON.

Once the lights switch ON they use the Fade Up fade rate to achieve the target level set by the curve.

MUST TURN ON is the level at which the dimmer must turn ON in spite of the time out. This would usually be due to a sudden thunderstorm or someone closing the blinds in a room. The fade rate is once again the fade up rate.

NON DIM Triggers

Non Dim outputs or relays have a simplified screen.

```
BOARD 21 Sc6-RLY8
Pcell IN1 360
Off if above 200 for
01:00 m:s.
On if below 130 and
05:00 m:s since off.
@Start on below 130
Must Turn ON@ 90
```

@ Start on Below ____ can only have two values. The OFF Level or the ON level. This is to get rid of the ambiguity of what the relay should do if the scene is turned ON when the photocell has a reading in the middle of the two levels. One would set the lower level if the scene was activated later in the day. The upper level for the morning.

Interfacing to Skylight Controls.

LC & D has partnered with several skylight manufacturers to provide the controls necessary to save energy when the light from the skylight is sufficient.

Solartube is one such manufacturer. They control excessive light from the skylight using a "Daylight Dimmer." This interfaces to our system by a 0-10Volt control signal. From the point of view of our dimmer this is just another light that needs to be controlled.

Other manufacturers use different systems such as louvers but they all have a 0-10V interface.

LC & D has incorporated some special features into the SCENE Scene to take advantage of skylights with controls. One of the requirements we run across is the need for the Lights in the room and the skylight be considered as one luminaire with a control curve that starts with the skylight wide open, dims the lights down to off then continues by closing down the skylight.



Daylight Dimmer

Special BINDING Feature of Dimmers 1 and 3

If Dimmer 1 or 3 is set to "PC" it is possible to hit ENTER on the Photocell choice. This is not possible on Dim 2 and 4. This Feature is only available on Scenes 5 through 12.

```
BOARD 25 Sn8-Dim1
Pcell IN 1 =70
Fade UP 0:10 Min/sec
Fade DN 0:20 Min/sec
Start MID OFF
100 400 1000
Time Out from OFF 03:00
MUST Turn ON @ 800
```

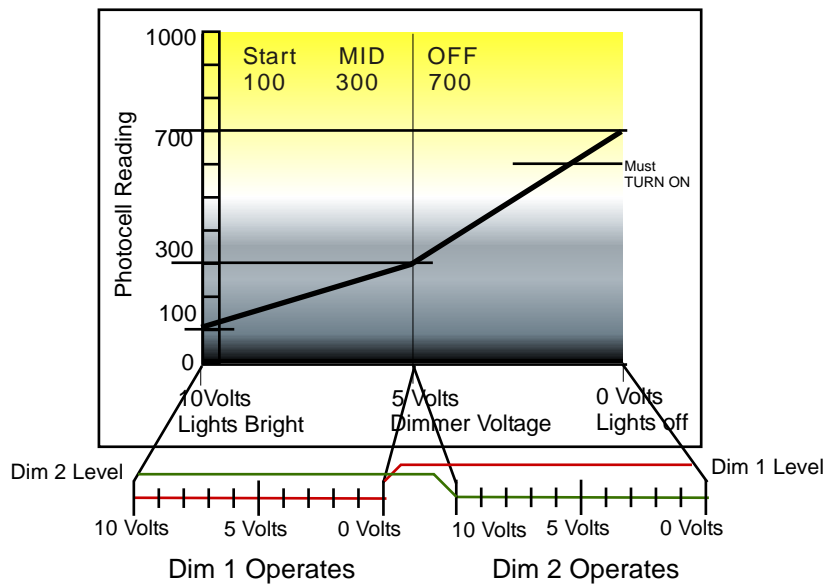
Press Enter on Dim 1's Photocell Choice to get this screen:

```
Binding Menu
Bind Enabled NO
```

Scroll to YES for the following options

```
BINDING MENU
Bind enabled: YES
Binding DIM2 to DIM1.
Output Ranges:
DIM1 1000-500
DIM2 500-0
```

DIM 2 should control the skylight while dim 1 the electric lights.



On Dim 1

Binding Menu
 Bind Enabled: YES
 Binding Dim 2 to Dim 1
 Output Ranges
 Dim 1 1000 - 550
 Dim 2 500 - 0

On Dim 3

Binding Menu
 Bind Enabled: YES
 Binding Dim 4 to Dim3
 Output Ranges
 Dim 3 1000 - 500
 Dim 4 500 - 0

Note: Dimmers may overlap in range or Dimmers may have a dead band between them. Dimmer 1 as seen from the bus is now a virtual dimmer comprising two loads that act as one. As Virtual Dimer 1 is reduced from 1000 (10 Volts) to 550 (5.5Volts) in output the actual Dim 1 will go from 10 volts to zero volts and then OFF. (Or End as shown on the screen for Dim 1.)

Meanwhile, Dim 2, or the second load in the pair remains at full output until the Virtual dimmer reaches the maximum of its range. As the Virtual dimmer reduces below the start point so too does dimmer 2.

As the Virtual dimmer increases the loads reverse their outputs in the same manner. The curve followed is set by Dimmer 1. The End or OFF point shown on that page refers to Dim 1.

```
BRD 21 55 SCENE
NO TIMER
DIM1 PC      RLY5 PC
DIM2 PC      RLY6 ON
DIM3 40%     RLY7 OFF
DIM4 40%     RLY8 N/A
FADE 00:03 min/sec
Override N/A
```

The second dimmer MUST be set to PC, it will not be forced to this state automatically. Pressing ENTER on the highlighted PC gets to this screen:

```
BOARD 41 Sc6-DIM2
Bound to channel 1
Relay mode: OFF
Ignore scene off on:
Dimmer 2
```

Labels: OFF, END, NONE, Dimmer 1, Dimmer 2

One can set if Dimmer 2 will turn OFF or just go to minimum dim. This feature is for scenarios where the second dimmer is not a skylight but a second electric load.

The purpose of the Ignore OFF option is to allow a Daylight damper to remain open when the Scene is turned off.

Dim 1 is being controlled by say Input #1. We do not care what Dim 4 is being controlled by, we only compare on the input of the first load that is in PC mode.

“Monitor” Screen

| | |
|-----------------------|-----------------|
| BRD 21 56 SCENE | Scroll Field |
| NO TIMER | N/A |
| DIM1 PC | In 1 |
| DIM2 PC | In 2 — On board |
| DIM3 N/A | In 3 INputs |
| DIM4 N/A | In 4 |
| FADE 00:03 min/sec | ID 25 — PCC-1 |
| Monitor N/A 25 | ID 26-1 |
| | ID 26-2 |
| | ID 26-3 — PCC-3 |

Number of steps change allowed

The “Monitor” function is an additional feature most often used when using overhead skylights. It prevents “faking out” the photocell.

For example a Classroom. The teacher opens a door that reflects exterior light up to the photocell. Normally this would result in a rapid dimming of the lights followed by the dampers of the skylights closing. The same thing happens if the light level has been reduced and the Teacher turns on an overhead projector that shines directly at the photocell. In both situations the preferred outcome is that the lights do not change.

One may program this to prevent step changes in the photocell on the first dimmer in the scene or select a second photocell with which to compare. Programming is tricky and should be done only by a factory trained Technician. Full details on programming are covered in a separate “Drill Book.” Phone the factory to have you system programmed.

| |
|-----------------------------|
| BRD 21 55 SCENE |
| TIMER: 0:12:00 H/M/S |
| DIM1 PC |
| RLY2 PC |
| DIM3 PC |
| DIM4 PC |
| FADE 00:03 min/sec |
| Override N/A |

The SCENE Scene “OFF” Timer

The Timer shown in a SCENE Scene is an “OFF” timer. It is very specifically designed for use with an occupancy Sensor.

The idea is that if the Occ Sensor is inaccessible, such as in a warehouse with 30 ft ceilings, one may set the Occ sensor itself with a very short time delay and use the Scene “OFF” timer to program the delay.

This works for both the contact closure inputs and sending commands to this scene over the bus.

Thus if this scene is in a Schedule it will not turn off at the scheduled time. It will wait the time shown in the OFF timer and then turn OFF.

This is also useful in offices and classrooms with override switches. If the Occ Sensor has its own 12 minute time out the occupants can leave the room after turning off the light. Then a few minutes later return and find that the Occ Sensor “does not work.” This is because it has not timed out. By setting a very short time out of 5-30 seconds the Scene does the timing and if overridden OFF will re-switch back ON when the occupants re-enter the room.

The NO AUTO ON Scene

(Displayed as NO AUTO) (iDIM and iDH)

This mode is only available on Scenes 5-12 which have hard wired inputs associated with them. It is for use with Occupancy sensors.

```

LCP 2      SCENES
5:NO AUTO  11:NO AUTO
6:NO AUTO  12:NO AUTO
7:NO AUTO  13:SCENE
8:NO AUTO  14:SCENE
9:NO AUTO  15:SCENE
10:NO AUTO 16:SCENE

BRD 22 512 NO AUTO
NO TIMER
DIM1 100%   RLY5 PC
DIM2 50%    RLY6 ON
DIM3 N/A    RLY7 ON
DIM4 N/A    RLY8 N/A
FADE 00:03 min/sec
    
```

The purpose of this type of Scene is to enable and disable the ON command from an Occupancy sensor. This turns the Occupancy Sensor into a "Vacancy Sensor" for all or part of the day. Vacancy Sensors only turn the lights off. The occupants may turn them ON or, if there is adequate light, not turn on the lights. Thus saving energy.

The Scene that the Occupancy Sensor controls is the same as a SCENE Scene. The Enable and DISABLE is done by controlling the "Virtual Relay" for that particular scene in the Manual Control Screen.

```

USER MENU
-----
MANUAL OVERRIDE
REVIEW SCHEDULE
GROUP LOADS
PROGRAM SWITCH
iDIM/iDH SCENES
SETUP MENU
    
```

```

Scene12: NO AUTO ON
LCP-2 LOAD-12
1- 3- 5- 7- 9- 11- 13- 15-
2- 4- 6- 8- 10- 12- 14- 16-
    
```

If the Virtual relay is ON then the Occupancy sensor works in a normal fashion. The person walks into the room and the scene turns ON.

If the Virtual relay, in this case, relay 12 because we are using Scene 12 as a "NO AUTO" Scene is OFF the occupant walks into the room and has to turn on the lights for himself.

He can turn on the lights using ANY method. He could use another scene or individual control of the dimmers. On exiting the room either the Occupancy Sensor delay timer or the Scene delay timer keeps the lights on for a few minutes and then turns them off.

Note that the virtual relay may ONLY be operated over the bus or from the Manual Control Screen. This means that the Occupancy sensor MUST be connected to a hard wired input on the dimmer control card and cannot use a Digilink Card to operate the Scene over the bus.

The "FLIP" SCENES

| LCP 2 SCENES | |
|--------------|-----------|
| 5 :FLIP-11 | 11 :SCENE |
| 6 :FLIP-12 | 12 :SCENE |
| 7 :FLIP-13 | 13 :SCENE |
| 8 :FLIP-14 | 14 :SCENE |
| 9 :FLIP-15 | 15 :SCENE |
| 10:FLIP-16 | 16 :SCENE |

The Flip Scenes are a special mode of the SCENE Scene. They handle the situation where a push button or occupancy sensor needs to have two different sets of programming at different times of the day.

The Left hand Scene can be "FLIPPED" to be the right hand scene depending on programming.

```
BRD 21 S5 FLIP-11
TIMER: 0:00:10 Input
DIM1 PC RLY5 PC
DIM2 100% RLY6 ON
DIM3 100% RLY7 ON
DIM4 100% RLY8 ON
FADE 00:03 min/sec
Override N/A
```

Trigger Mode

Trigger by INPUT means that the state of the contact closure input determines which scene is being used. Closing the contact turns ON Scene 5 (or as applicable) while Opening the contact Flips to scene 11 or as applicable.

The purpose of this scene is for Retail stores where a display with a lot of bright lights is only triggered when people are present and drops back to a lower powered scene when they are not.

Trigger by RELAY

```
BRD 21 S5 FLIP-11
TIMER: 0:00:10 Relay
DIM1 PC RLY5 PC
DIM2 100% RLY6 ON
DIM3 100% RLY7 ON
DIM4 100% RLY8 ON
FADE 00:03 min/sec
Override N/A
```

Trigger by RELAY is the most useful implementation of the dual scene concept. As was done in the NO AUTO ON Scene we use the Virtual Relay in the Manual control screen to control which of the two scenes will be used. If the Relay is ON the left hand Scene (5-10) is used. If the relay is OFF then the Right hand Scene will be used.

```
Scene5: FLIP-11
LCP-2 LOAD-5
1- 3- 5 7 9 11- 13- 15-
2- 4- 6 8 10 12- 14- 16-
```

Relays 5-10 may ONLY be operated over the bus. The Contact Closure Hardwired input determines if the Scene is ON or OFF while the Status of the relay determines which scene shall operate. If the contact is in the closed position when the virtual relay is turned OFF the scene changes over or FLIPS to the Right Hand Scene.

Operating FLIP Scenes over the Bus

This FLIP Scene concept is so useful it had to be made available over the bus.

Since we have two scenes being operated here in tandem as part of a single program the way it is done is that the virtual relay for the RIGHT HAND Scene (Scenes 11-16) becomes the control for ON and OFF. Though it can be operated in parallel with a contact closure input it may sometimes require an extra operation to get it into sync. It is best not to use both methods to control the same function.



This is quite a brain bender to program correctly.

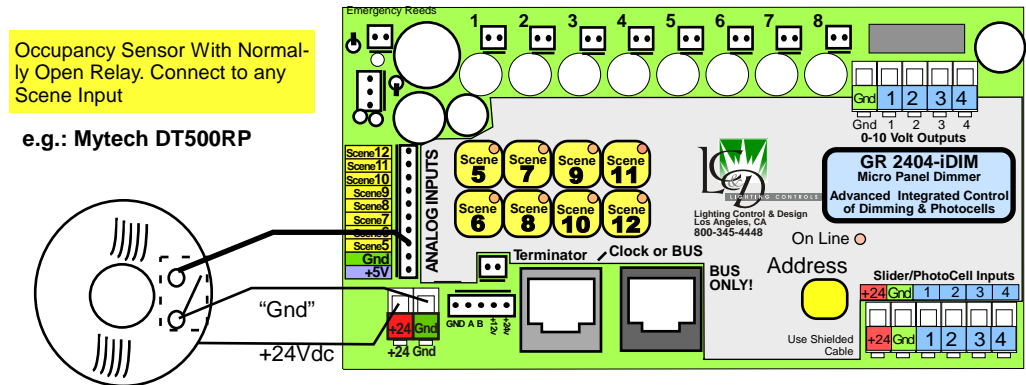
Controlling Over the Bus = Use the right hand Scene.

Controlling with the Hard wired input = Use the contact closure for the Left hand Scene.

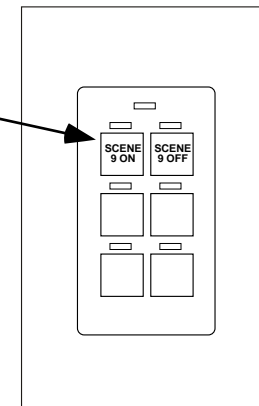
Controlling which of the two scenes is ON: Control the left hand scene over the bus.

Thus in the example shown in the Manual Control Screen and assuming all the left hand scenes are FLIP scenes we have the following.

On the FLIP 11 Pair Scene 5 will be operated.
 On FLIP 12 Scene 12 will be operated. etc etc
 On FLIP 15 Scene 15 will be operated and as shown by the virtual relay being ON Scene 15 is currently ON.



Actually Programmed to operate Scene 15



RAISE/LOWER

RAISE/LOWER is a special case for a scene. The function is either ON/RAISE or OFF/LOWER.

Digital Switches that control RAISE/LOWER must be programmed as MAINTAINED. The way that a Raise/Lower scene works is as follows. First tap fades to pre-set, or OFF. Second tap jumps to Full ON or OFF. Push and Hold will set a new level for the PRE-SET. PRE-SET is the memory location associated with individual dimmer channels. As such it is a supplemental scene and may be re-programmed by both the RAISE/LOWER buttons and a single button programmed as MAINTAIN for a single Dimmer.

| | |
|--|---|
| <pre>BRD 21 S5 RAISE DIM1 N/A RLY5 N/A DIM2 RAISE RLY6 ON DIM3 RAISE RLY7 ON DIM4 RAISE RLY8 ON FADE 00:03 min/sec Tap Jump: N/A</pre> | <pre>BRD 21 S6 LOWER MIN OFF DIM1 N/A RLY5 N/A DIM2 LOWER RLY6 OFF DIM3 LOWER RLY7 OFF DIM4 LOWER RLY8 OFF FADE 00:03 min/sec Tap Jump: N/A</pre> |
|--|---|

TAP JUMP

For normal operation of the Raise lower this should be set to N/A. If the client wants the lights to only change a small percentage with each button push or tap then scroll to a percentage that he wants all the way up to 25%. This is most useful for Louvers or Sunlight Dimmers used in Skylights.

```
FADE 00:03 min/sec
Tap Jump: 10%
```

LOWER- MIN=1% or OFF

The Lower Menu has an additional feature. One may set the minimum dim to 1% or one may set it to OFF. If the client never wants the lights to go all the way off then set this field to =1%.

RAISE/LOWER Scenes above Scene 8

```
LCP 2      SCENES
5 :RAISE
6 :RAISE
7 :RAISE
8 :RAISE
9 :RAISE
10:RAISE
11 :RAISE
12 :RAISE
13 :RAISE
14 :RAISE
15 :RAISE
16 :RAISE
```

The RAISE Lower Scene Above Scene 8 have an additional feature. They can be tied to a particular Scene with Photocells so that the action of the RAISE or LOWER Buttons do not cause the light levels to exceed the levels that would have been set by the photocell.

| | |
|--|--|
| <pre>BRD 22 S15 RAISE MAX SCENE 8 FADE 00:10 min/sec Tap Jump: 10%</pre> | <pre>BRD 22 S16 LOWER MIN OFF SCENE 5 FADE 00:10 min/sec Tap Jump: 10%</pre> |
|--|--|

In practice this is not as nifty as it might at first appear. The only way it works is if one first lowers the lights. Then they can be RAISED. One may not use the RAISE button first (Since the level is already at that of the photocell. Only Scenes 5-8 may be controlled in this way.

RE-START Scene

```
BRD 21 56 ReStart
TIMER: 1:00:00 H/M/S
DIM1 PC      RLY5 N/A
DIM2 PC      RLY6 N/A
DIM3 PC      RLY7 N/A
DIM4 N/A     RLY8 N/A
FADE 00:03m/s NO-OFF
Override N/A
```

Though some clients do not want occupants to raise the light levels above that set by the photocell others are willing to allow a bit more local control. The Re-Start scene is for daylight harvesting when override control is allowed to be brighter than the setting of the photocell. The idea is that periodically the photocell will re-assert control.

The time between each re-Start is set by the timer. Note that though we are using the same timer as is used in a SCENE Scene it has been re-purposed to act as the timer between restarts.

Note that the Scene will only LOWER the level to the level of the photocell. It will not raise it if the level is below that of the setting of the photocell. In this way we obtain maximum energy savings. The Lower is done with a 3 minute fade rate. This is usually imperceptible to the occupants.

Programming the Re-Start Scene

A RE-START Scene must be operated by a GROUP. The Group should be set up as a MAINTAIN type group in most cases. If set up with a timer the Scene will act like a SCENE Scene and will have off sweeps.

The way it works is that while the Group is ON the timer is used to re-trigger any photocell channel as long as the current level is higher than it should be. It does not affect channels which are not photocells. It only acts to reduce the light level if it has been raised. The fade rate is a long 180 seconds so that it will be less noticeable.

Special Considerations for a RE-START SCENE

Because the RE-START Scene is only active while the GROUP is ON a provision has been added for what happens when the GROUP is turned OFF.

Normally a Scene would be turned OFF when the Group is turned off. But in this case one might wish to just turn OFF the Re-Start feature rather than the scene itself. Thus when it says “NO-OFF” this is what happens. The Group turns OFF but the Scene stays ON and now acts like an ordinary SCENE Scene.

OFF-OK means that when the Group turns OFF the Scene will also turn OFF.

```
BRD 21 56 ReStart
TIMER: 1:00:00 H/M/S
DIM1 PC      RLY5 N/A
DIM2 PC      RLY6 N/A
DIM3 PC      RLY7 N/A
DIM4 N/A     RLY8 N/A
FADE 00:03m/s OFF-OK
Override N/A
```

RE-START in RE-ITERATE Mode

```
BRD 21 56 ReIterate
TIMER: 1:00:00 H/M/S
DIM1 PC          RLY5 N/A
DIM2 70%        RLY6 OFF
DIM3 0%         RLY7 OFF
DIM4 N/A        RLY8 ON
FADE 00:03m/s  OFF-OK
Override N/A
```

Scrolling on RE-START changes the function to ReIterate.

The RE-START function is primarily for Photocell control loads. It will not cause the dimmer to go back to Photocell setting unless the setting is below the current setting. Additionally any dimmer that is a fixed setting, say 50 % and is raised will be left alone as will the status of relays should they have been changed.

In the Re-Iterate mode there are no conditions. It is as though the scene button had been pushed again. This is repeated each time the timer gets down to zero.

Using this mode one can handle the very infrequent situation of the ON timer. In this situation the client does not want the lights to go off for more than a certain amount of time. If they do then the lights need to come back on again.

FREEZE Scene

```
BRD 21 58 FREEZE
On Scene 5:
Ignores PCC and OCC.
Lock out bus: No
until timeout or
cancel, then returns
to scene.
TIMER: 1:00:00 H/M/S
```

The Freeze Scene is designed for classrooms when they want a “Quiet Period” or are dimming the lights for an AV presentation.

The Freeze Scene can operate on a designated scene which can be from Scene 5 through Scene 16 omitting of course the scene that is doing the Freezing.

During this time the class is supposed to be very still and the Occ Sensor might time out. The freeze scene will “Ignore” the actions of the photocell and the Occ sensor for the period of time shown or until the FREEZE is canceled. Lights may be controlled by RAISE and LOWER buttons or other switches that do not operate the same scene as the Occ Sensor. Once FREEZE Scene times out or the FREEZE is canceled the scene selected is the one put back in charge. In the example above it would be Scene 5.

FREEZE Scene with an OCC Sensor over the bus.

If the Occ sensor to be frozen in a freeze Scene is operating via DigiLink and sending the signal over the bus an additional action has to be taken. That is to go into Relay Properties and for the scene in question put a Y in the "Occ Sensor Via Bus" Line. This causes any over the bus commands directed at scene 5 to be ignored. BUT it does not prevent the LOADs in Scene 5 from being controlled by another Scene.

```
Board Version: 2.45
 1 2 3 4 5 6 7 8
Normally Closed
  Y Y Y Y Y Y Y Y
No Blink
  - - - - - - - -
Occ Sensor Via Bus
  - - - - - Y - -
```

FREEZE Scene with LOCK OUT BUS = YES

```
BRD 21 58 FREEZE
On Scene 7:
Ignores PCC and OCC.
Lock out bus: Yes
until timeout or
cancel, then returns
to scene.
TIMER: 1:00:00 H/M/S
```

The FREEZE Scene has one additional option. Usually only the action of the photocell or the OCC Sensor are ignored. If "LOCK OUT BUS" is set to YES that means that all the LOADs in the Scene selected cannot be controlled by any other means until the Freeze is lifted either by turning OFF the FREEZE scene with a switch or the timer times out.

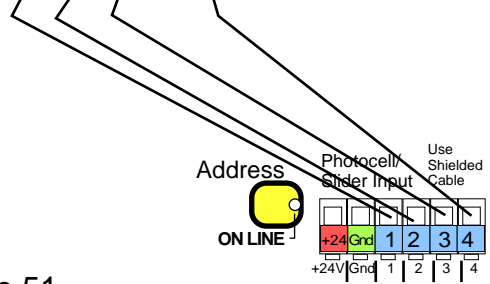
Input -Output Status Confirmation

There are two locations where one can observe the actual input levels from the photocells and the output levels of the dimmers.

First is on the Manual Control Screen: Scroll through the first 4 dimmers and watch the top line. It will alternate between the Input of Photocell 1 and the Output of Dimmer 1.

```
Output is: 0.50 Volts
LCP-2 LOAD-1 DIM
1- 3- 5- 7- 9- 11- 13- 15-
2- 4- 6- 8- 10- 12- 14- 16-
```

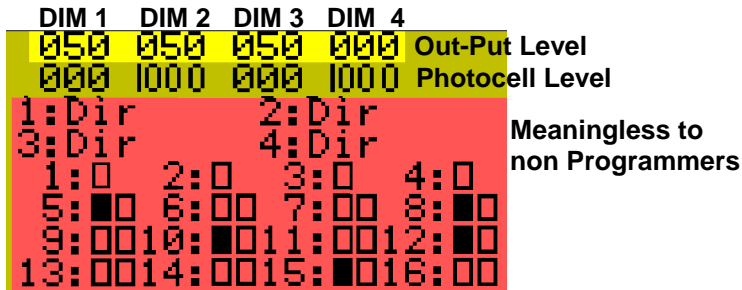
```
Input is: 1000
LCP-2 LOAD-1 DIM
1- 3- 5- 7- 9- 11- 13- 15-
2- 4- 6- 8- 10- 12- 14- 16-
```



Photocell inputs correspond to numbers 1-4

Input -Output Status Confirmation (Continued)

The second location where the input and output statuses are displayed is within the Scenes Menu. By pressing Enter when the LCP Number is highlighted one can get to the "PROGRAMMER'S DEBUG SCREEN." This screen only means something to the programmer of the dimmer, but he did add a summary which is useful on the top two lines. These show the four dimmer outputs and the four photocell inputs at a glance.



HID Mode Action of the Switches

An HID light has a re-strike time of many minutes. It may take up to 15 minutes to get back to full brightness after the light has been turned off. In fact some HID systems require the lamp to cool for 15 minutes before they can be turned on again. Thus a dimmer that turns the light off by mistake would be useless.

To prevent the inadvertent turning off of an HID Dimmer the following protocols should be observed.

a) For manual control use two button Digital switches (per set of loads) which are programmed as Raise and Lower. These will be programmed to control a Raise Scene and a Lower Scene.

The action of the Buttons is as follows: The Raise Button is the same as always.

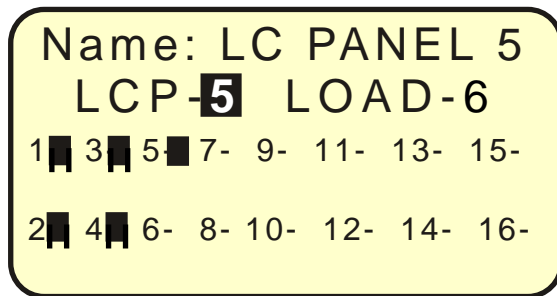
The Lower button is different. Pushing and Holding will take one to Minimum dim but the Lamp will not turn OFF. Double tapping will take one to Minimum Dim but the lamp will not turn OFF.

Once the lamp is at minimum dim, an additional double tap will turn off the lamp. If the lamp is even at 1% above minimum dim it will take moving it down to the minimum before the light can be turned off.

Remote Manual Operation using the Manual Control Menu.

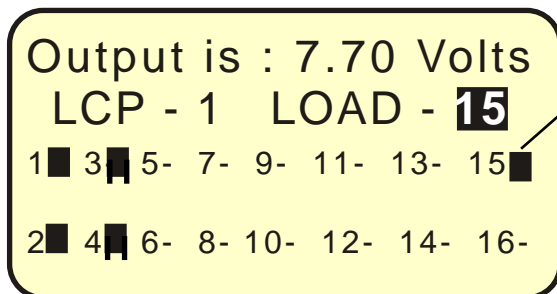
In a standard GR 2400 relay panel the loads are turned ON or OFF by scrolling the load number to the load desired and then pressing ENTER. One presses ENTER a second time in order to Toggle the status of that load.

With the MP-DIM one may do the same but must take into account the type of load or scene being controlled. On Load 1-4 they respond to Taps and a push and hold will program the Preset Memory. PROGRAM, RAISE & LOWER Scenes also use taps and push and hold.



■ = Level of output is currently changing

Scroll on the load number to look at the current output of Channel 1:

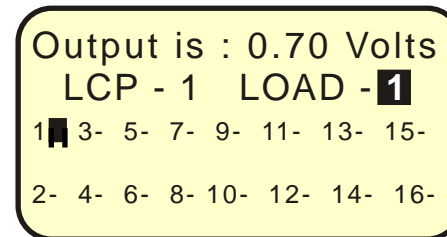


Scene 15 has just been activated

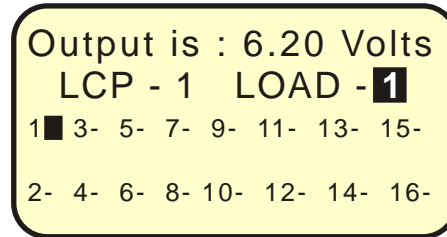
Loads 1 & 2 have reached the programmed output level while Loads 3 & 4 are still fading up.

A SCENE type Scene, a RELAY Scene and a Scene in NO AUTO ON act just like an ordinary relay or Non Dim output. They toggle with each push of the ENTER button and Push and Hold has no meaning.

One may try and set the levels of Dimmers 1-4 by pushing and holding on the ENTER button or even doing this remotely using the clock emulation on a computer. Though the fade time is very slow it is still rather hard to get the level one wants.



Push IN



Let Go

If the Scene being controlled is a RAISE or LOWER Scene it will not indicate on the MANUAL Control Menu. Push and Hold on the ENTER button does work to RAISE or LOWER the loads but once again it is difficult to get it just right.

Programming Schedules -iDH

Programming a schedule for an MP-iDH is the same as programming a Schedule for any relay panel in the GR 2400 System. One may use Relays 1-4 to control relays directly or a Scene Relay to control them indirectly. Remember that relays 5-8 can ONLY be accessed through a scene.

Programming Schedules iDIM

When programming an iDIM always use a SCENE scene.

Scheduling a SCENE

One may program the Scene as MAINTAIN, MNTN + TIMER and MNTN + BLINK.

Note that in the MAINTAIN Schedule the Lights will go to the Scene Settings at the ON time and will turn OFF at the OFF time. This applies to both PROGRAM and SCENE type scenes. One should not use a PROGRAM scene with a schedule if one can help it.

SCHEDULES PAGE 1-5

| | |
|--------------|-------------|
| SCH 1 | GROUP 1 |
| SCH 2 | GROUP 2 |
| SCH 3 | GROUP 3 |
| SCH 4 | GROUP 4 |
| SCH 5 | => NO LOADS |
| SCH 6 | UNUSED |

GROUP 5 **MNTN+TIMER**

EDIT: LCP-5 LOAD-4

LCP5: 5
LCP6: 5
LCP7: 5

List of
Scenes
being
Operated.

GROUP 6 **MAINTAIN**

EDIT: LCP-5 LOAD-5

LCP5: 5

Scene 5

SCH 5 EXCEPT NONE

MONDAY-FRIDAY

ON TIME: 09:00am
OFF TIME: 05:00pm
SAT ON TIME: 10:00am
OFF TIME: 04:00pm
SUN ON TIME: 11:00am
OFF TIME: 03:00pm

Programming Multiple Scene Schedules

One can take advantage of the fact that any SCENE scene that contains one or more of the same dimmers as another scene will “drop out” that scene when it is turned on.

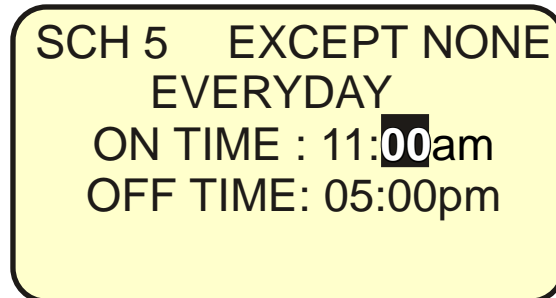
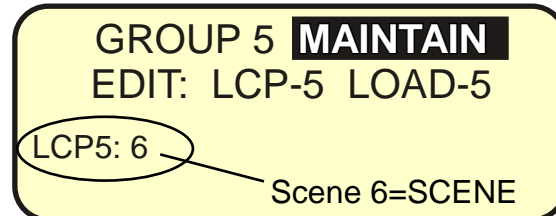
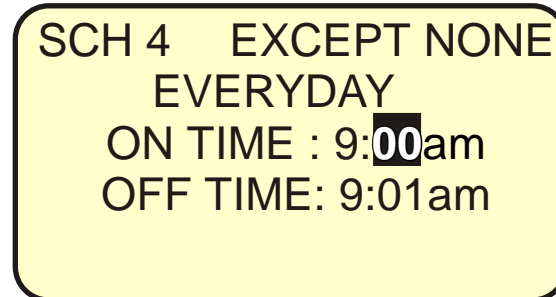
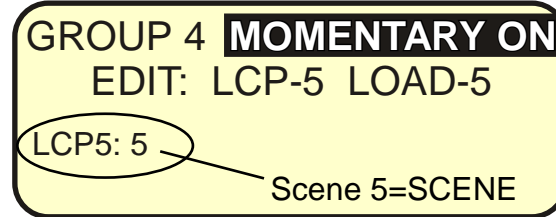
In the situation where one scene setting is needed at a certain time and another at the next time and so on one programs as follows:

Put in a schedule with the correct ON time. Put in an off time an hour or so later. This is irrelevant but an OFF time MUST be programmed at least 1 minute later than the ON time. Have this Schedule control a MOMENTARY ON Group with the relay for the correct Scene in it. The Scene mode must be SCENE. (Will not work with PROGRAM.)

Note that the last scene to turn ON may be set up as a MAINTAIN Group so that at the OFF time the lights are turned OFF.

This setting of multiple scenes one after the other works because the first scene “drops out” when the next scene is commanded

Note that a Scene with Photocells followed by a Scene where the channels with the photocells is not touched will not drop out control of those channels by a photocell. The rule is that when a Scene drops out because one of the items in the scene was changed the ones that were not changed remain as they were. (including the photocell channels.)



Programming Switches

Programming Digital switches to control an iDH is the same as programming a relay panel.

Programming switches to control an iDIM is not as simple since there are certain actions that will not work.

RULES:

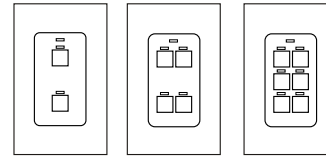
1) When controlling a dimmer directly (loads 1-4 of the Dimmer LCP) they must be programmed as MAINTAIN type buttons. This allows for pushing and holding and double tapping the loads. A single Button acts like a toggle control of a dimmer. The first tap goes to preset, the second tap goes down to off. A Double tap when the dimmer is at OFF will jump to full bright. A double tap when the dimmer is ON at any level will jump to off.

2) A Scene in PROGRAM, RAISE or LOWER mode must also be controlled by MAINTAIN.

Using ON, OFF or Toggle may or may not work with these Scenes. It is totally unreliable since the dimmer was not designed to use these functions. So DON'T use ON, OFF or TOGGLE on a scene in PROGRAM, RAISE or LOWER mode.

3) On the other hand a scene in SCENE Mode may be programmed as ON, OFF, Toggle or MAINTAIN. The Maintain will act like it does on a relay, push the button and the Scene fades ON, let go and it fades to OFF.

4) For an iDH a RELAY Sn may be programmed with ON, OFF, Toggle or MAINTAIN.



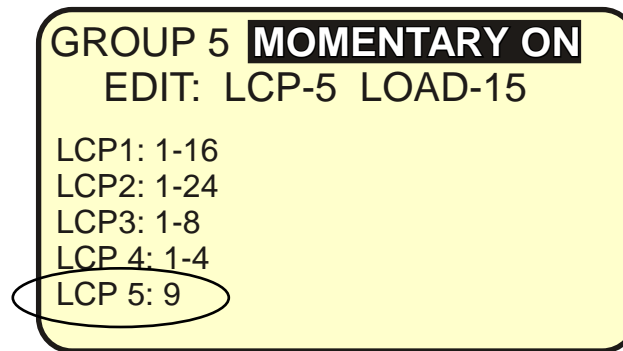
Digital Switches

Programming All ON and ALL OFF Switches that include Relay Panels.

In this situation one uses a scene in SCENE mode to control the channels of the Dimmer panel.

Pre program a scene say Scene 9 (relay 9) to be SCENE and each channel to be 100%

For instance if there are 4 relay panels and a single dimmer panel as LCP 5 the ALL ON Group might look like this:



The Off Group would have the exact same list of relays including LCP 5 and would be a Momentary OFF.

Programming Switches for HID Loads

HID Loads that are being dimmed have a special feature to prevent the load from being turned off easily. This feature is **only available** on the RAISE and LOWER scene mode.

If the output has been designated as an HID load in the relay properties menu the Lower button works as follows:

Push and hold to lower will bring the load to minimum dim. Double tap Lower once at minimum dim and the light will turn OFF. At any level other than minimum dim the double tap LOWER will jump to minimum dim.

Thus the only way to turn the light off is to take it to minimum dim and then double tap.

An HID Load may be programmed to be a scene in PROGRAM mode. This does not allow the off command to work since pressing the button just takes the levels to those set in the scene.

If programmed in SCENE mode with a preset level of 1% or above the Scene will take the lights to the preset when turned ON and will fade to minimum dim when set to off. In Scene mode the only way to turn the HID load off is to have a scene where the preset is 0%. The reason for this is so that an Occupancy sensor may operate an HID load in Bi-level mode taking the Brightness up to the level demanded by a photocell and then down to minimum dim when no one is present. This is used in warehouses and security situations.

Relays 1-4 in HID Mode

Relays 1-4 in HID mode cannot be turned OFF. Thus a button programmed to control 1 through 4 will act like it would with a normal dimmer except one can never set the lights lower than minimum dim. To turn them off requires either a LOWER type scene or a SCENE or PROGRAM scene with that channel or channels set to 0%.

Tech Support:

Though this manual is provided for reference we expect few clients will program the dimmer themselves. We expect that the system will have a modem and our factory trained Technicians who program systems every day of the year will do it for you.

Please call us at (800) 345 4448 and we will dial in and put in all the settings for you that were not pre programmed at the factory in the first place.

Warranty

Lighting Control & Design Inc. warrants each new unit for 36 months from date of shipment to be free of defects in material and workmanship under conditions of normal use and specified ambient temperature when installed and operated under LC & D's product specifications and in accordance with the National Electrical Code.

LC & D shall at its option, repair or replace any defective unit which in its opinion, has not been improperly installed, wired, insulated, used or maintained, provided however that LC & D shall not be required to remove, install or re-install any defective unit and provided that LC & D is properly notified of said defect within the aforementioned warranty period.

Additionally, LC & D shall also replace any relay that fails within the first 36 months under a "no questions asked" exchange policy.

The foregoing warranty and optional remedies are exclusive and, except for the foregoing warranties THERE ARE NO OTHER WARRANTIES OF MERCHANTABILITY OR OF ANY OTHER TYPE. In no event shall LC & D or any other seller be liable for consequential or special damages, nor for any repair work, undertaken without its prior written consent, nor shall LC & D's liability on any claim for damages arising out of or connected with the manufacture, sale, installation, delivery or use of said unit ever exceed the price paid therefore.



905 Allen Ave, Glendale, CA 91201

For all Technical Questions and free dial up programming call
(800) 345- 4448

ADDITIONAL LC&D RESOURCES

(hyperlinks provided below)

Specialty User Guides

[MicroPanel™ Design Guide](#)
[Photosensor Placement Guide](#)
[xCella Pairing Guide](#)
[xCella Door Sensor Installation Guide](#)
[xCella Wall Occ Installation Guide](#)
[xCella Wireless Switch Installation Guide](#)
[xCella Wireless Keycard Installation Guide](#)
[xCella Lamp Control Module Installation Guide](#)
[xCella Door/Window Sensor Installation Guide](#)
[xCella Ceiling Occ Installation Guide](#)
[Link-To™ DMX Manual](#)

Programming Guides

[GR2400™ Final Activation
Checklist](#)

Software Guides

[Unity GX2™ Customer Submission Guide](#)