DRAKE LIGHTING
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DOC-8616e
Rev. 1

OWNER'S MANUAL

for

LED-B-HYBRID-G5 /3MI

E2 type towers

Gen 5.0

Revision table

Revision	Date	Changes
1	March 3rd, 2020	Initial release

Safety Instructions

1. ⚠ All the safety and operating instructions should be read before the product is operated;
2. ⚠ The safety and operating instructions should be retained for future reference;
3. ⚠ Only qualified personnel should attempt maintenance or repair on this system;
4. ⚠ Use copper wire only for interconnections;

5. ⚠ High voltage (≈200V) is present in the power & control unit when it is energized. When the system is energized, never attempt to touch any component in the PCU , except push buttons;
6. ⚠ Shut off the associated circuit breaker before doing any service in the power & control unit or the beacon;
7. ⚠ Line voltage (120V/240V) is present in the power & control unit as long as the associated circuit breaker is on;
8. ⚠ Only use this power & control unit with the Technostrobe beacon supplied with it;
9. ⚠ Do not attempt to connect any incandescent beacon to this power & control unit;
10. ⚠ Do not connect the beacon directly to 120VAC or 240VAC circuit. It must be connected to the power & control unit;
11. ⚠ Do not look directly at the beacon when it is in operation. The beacon releases intense light flashes which can damage eye if sighted directly.
12. ⚠ Do not look directly at the beacon when it is in operation, even if it appears not to produce any light. The beacon may still release intense infrared (IR) light flashes which are not visible but can damage eye if sighted directly.
13. ⚠ The MARKER OUT voltage is following the POWER IN voltage. Only use markers rated to the POWER IN voltage.

Contents

Technical assistance to our customers

Drake Lighting distributes Technostrobe's systems. Drake Lighting has highly-qualified service representatives and technicians available by phone and email 24/7 for technical support. Customer and technical services are available at our toll free number: (800) 732-9526 and email: info@drakelighting.com.

Limited product warranty

Technostrobe Inc. (hereinafter "Technostrobe") warrants the products sold by Drake Lighting to be free of manufacturing defects in design, material and workmanship at the time of shipment and for the limited period provided hereunder, when used in and under normal use conditions:

- LED Products and control mechanism are covered for a period ending five (5) years after the date of shipment of the product by Drake Lighting.
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The sole obligation of Technostrobe under this warranty is limited to the repair, replacement or reimbursement of the defective product determined to be inoperable due to manufacturing defect in design, material or workmanship, at Technostrobe's sole discretion. Technostrobe reserves the right to request return of the product for inspection prior to making any decision regarding a claim. No returned product will be accepted by Technostrobe without its prior authorization through an RMA number and customer must follow the warranty claim procedure indicated hereunder.

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Any warranty claim must be made in writing at Drake Lighting P.O. Box 351,1209 Compressor Drive, Mayfield, KY 42066, or by email at info@drakelighting.com. A request for a Return Authorization Number (RMA) must be made the same way or by telephone at (800) 732-9526.

The Product must be carefully repacked, insured up to a minimum equal to the total price paid for said product and returned at customer's cost, at Drake Lighting's abovementioned address, freight costs prepaid. Any product sent without RMA or sent collect will be refused and returned to sender.

Limitations, exclusions and disclaimers

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Commitment to quality

Drake Lighting is determined to provide its customers with products and services of the highest quality, performance and reliability - at competitive cost.

Introduction

This manual provides information about the operation and installation of this system. Please take time to carefully read this instruction manual prior to installation or use of this LED system.

System description

This product is a medium intensity LED based beacon system. It includes a beacon, a power & control unit (PCU) and a photocell. The beacon is capable of white illumination, red and infrared (IR). All 3 of these components are designed and manufactured by Technostrobe in Canada and are fully certified to the applicable FAA standard.

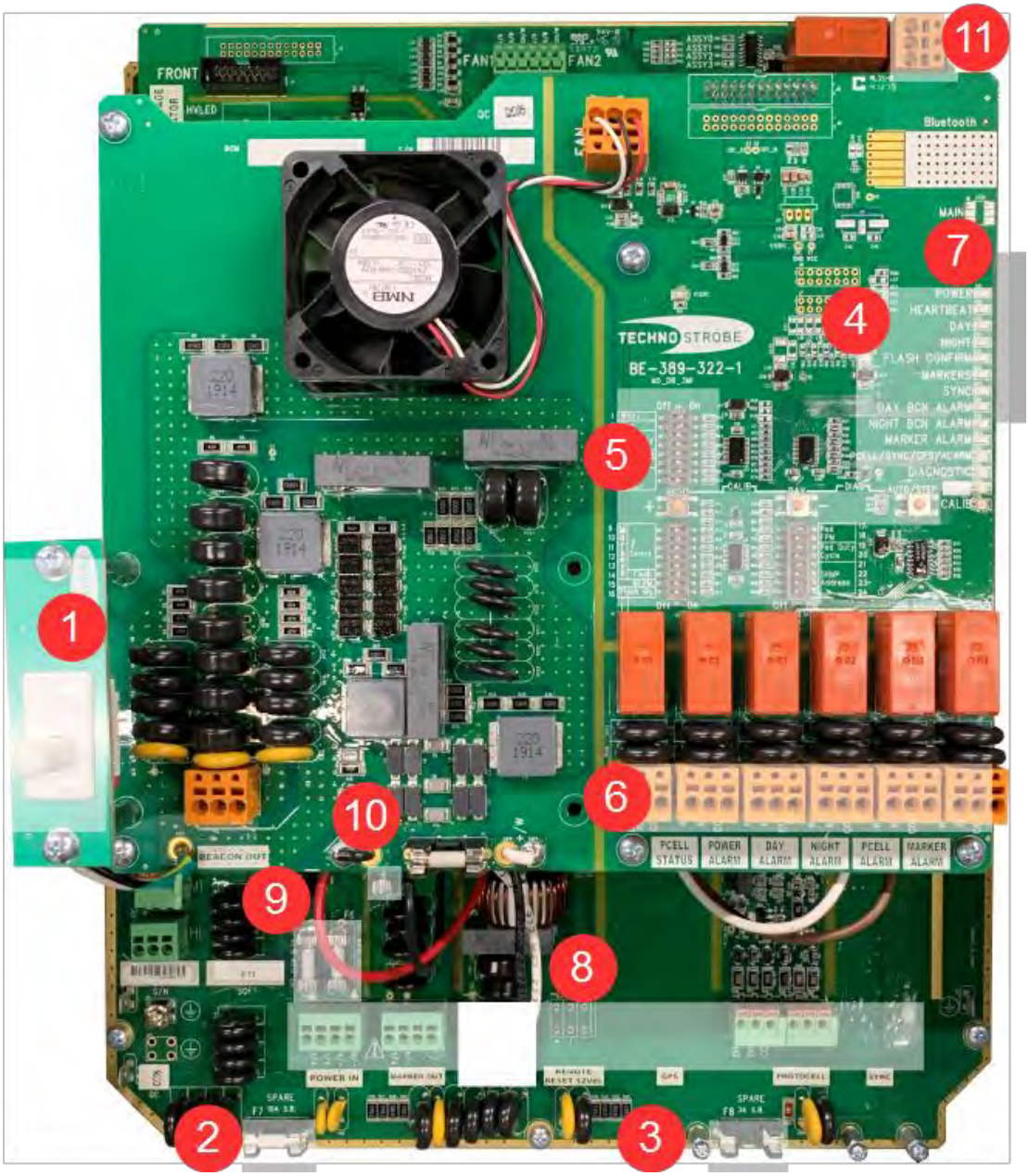
Specifications

	120/240Vac version	24/48Vdc version
Light		
Horizontal coverage	360°	
Vertical beam	3°	
Flash effective intensity	Day/Twilight: White 20 000 Cd (± 25%), Night: Red 2 000 Cd (± 25%) and IR 800mW/sr (± 25%)	
Flash color	Day/Twilight: White or Red, Night: Red and IR	
Lamp type	LED	
Flash rate	Day/Twilight: 40/60 FPM, Night 20/30/40/60 FPM (selectable)	
Flash duty cycle	Day/Twilight: 100msec, Night 16%/51%/66%/100% (selectable)	
Transport Canada type	CL-865, CL-866, CL-864	
FAA Type	L-865, L-866, L-864	
Electrical		
Input voltage	120/240V (88V-264V) AC 47-63 Hz	24/48V (18V-56V) DC
Recommended circuit protection	2A to 15A	12A min.
Power consumption	120 Watts (3A rms max.)	105 Watts (3A rms max.)
Power factor	>0.9	
Alarm contacts	24V / 2A maximum	
Mechanical		
Operating temperature	-40°C to 55°C (-40°F to 131°F)	
PCU dimensions	Painted Steel : 381 mm x 432 mm x 262 mm (15" x 17" x 10.3")	
PCU weight	16 Kg (35 lbs)	
Beacon dimensions (dia. x height)	48,4 cm x 35,9 cm (19" x 11")	
Beacon weight	5,5 Kg (12 lbs)	

Power & Control Unit

The power & control unit (PCU) is designed to power any Technostrobe's medium intensity LED based beacon. It contains the power supply, the photocell and the beacon monitoring circuit. It may also include GPS monitoring, sync card and remote communication card. All power supply electronics are located in the power & control unit which is installed at ground level.

Power & Control Components



1	On/Off Interlock switch	6	Dry contact relays: Pcell status Alarms: power, day, night, pcell, marker
2	Fuse: Spare 10A S.B. (Main)	7	SNMP enabler module (not shown)
3	Fuse: Spare 1.5A S.B. (Marker)	8	Terminals: Power, Marker, Beacon, Remote Reset, GPS, Digital IN, Photocell, Sync.
4	Indicator lights	9	Fuse: Main 10A S.B. (Qty. 2)
5	Push buttons and configuration DIP switches	10	Fuse: Marker 1.5A S.B. (Qty. 1)
		11	Not used

Indicator Lights

The indicator lights provide a brief yet complete diagnostic of the current state of operation of the system. Please refer to the table below:

Indicator	State	Meaning
POWER	Solid - Green	The PCU is powered ON
HEARTBEAT	Solid - Green	The PCU is not operating normally
	1Hz - Green	The PCU is operating normally
	4Hz - Green	The PCU software is being updated
DAY	Solid - Green	Day mode auto
	1Hz - Green	Day mode temporary
	4Hz - Green	Day mode permanent
NIGHT	Solid - Green	Night mode auto
	1Hz - Green	Night mode temporary
	4Hz - Green	Night mode permanent
FLASH CONFIRM	Green	Beacon output is live. Confirms beacon flash
MARKERS	Green	Markers output live.
SYNC	Solid - Green	
	1Hz - Green	GSP detected
	4Hz - Green	GPS + PPS present
DAY BEACON ALARM	Solid - Red	Alarm. Cannot flash beacon
	1Hz - Red	Beacon not connected
	4Hz - Red	Overcurrent
	4Hz - alternate with NIGHT BEACON ALARM	Polarity error
NIGHT BEACON ALARM	Solid - Red	Alarm. Cannot flash beacon
	1Hz - Red	Beacon not connected
	4Hz - Red	Overcurrent
	4Hz - alternate with DAY BEACON ALARM	Polarity error
MARKERS ALARM	Solid - Red	Alarm. Cannot power markers
	1Hz - Red	Calibrating markers
	4Hz - Red	Not calibrated
PCELL/SYNC/GPS	Solid - Green	PSU is master
	1Hz - Red	Alarm. Cannot find photocell or GPS or communicate with master PCU
	4Hz - Red	Photocell override
DIAGNOSTIC	1Hz - Red	Flash delay select ON
	1Hz - Yellow	Option #1 running
	4Hz - Yellow	Option #2 running
CALIB	Green (solid/flash)	Beacon calibrated
	Red (solid/flash)	Beacon not calibrated

Control Buttons

Three control buttons provide a means to control the operation mode of the system. The buttons are pressed individually or simultaneously. Please refer to the table below:

Switches	Pressed	Behavior
AUTO	Momentarily	Initiates AUTO mode with photocell control
DAY	Momentarily	Initiates temporary DAY mode for 5 minutes
DAY	More than 5 seconds	Initiates permanent DAY mode
NIGHT	Momentarily	Initiates temporary NIGHT mode for 5 minutes
NIGHT	More than 5 seconds	Initiates permanent NIGHT mode
AUTO+DAY	Momentarily once	Invokes diagnostic Option #1, Exit any diagnostic
AUTO+DAY	Momentarily twice	Invokes diagnostic Option #2, Exit any diagnostic
DAY+NIGHT	Momentarily	Initializes the marker calibration
DAY+NIGHT	More than 5 seconds	Initializes the beacon calibration
AUTO+DAY+NIGHT	Momentarily	Clears the calibration of the beacon
AUTO+DAY+NIGHT	More than 5 seconds	Clears the calibration of the beacon and the markers and reboots

Option DIP Switches

The option DIP switches provide a mean to specify details on the operation mode of the system. Unless otherwise specified, the DIP switches must be operated only when the system in turned OFF. The table below provides a quick overview of the switches and a detailed description of each is provided in the following section.

SWITCH ONE

DIP Switch	Option
1	White Beacon operation
2	Red Beacon operation
3	Catenary
4	
5	Soft ON
6	US / Canada
7	Not used
8	Not used

SWITCH TWO

DIP Switch	Option
1	Marker quantity or flash delay
2	
3	
4	
5	
6	Marker flash or flash delay
7	Not used
8	Flash delay

SWITCH THREE

DIP Switch	Option
1	Flash per minute
2	
3	Duty cycle
4	
5	SNMP Address
6	
7	
8	

White Beacon, Red Beacon

These switches permit to turn the white or the red beacon OFF. The table below shows the operation modes resulting from the status of these dip switches and the photocell. For normal L-865, CL-865, L-866 or L-866 operation, both switches are set to ON.

SWITCH ONE	
1	**White Beacon Operation**
off	OFF
on	White beacon flashes in DAY White beacon flashes in NIGHT if SW1-2 red beacon is OFF

SWITCH ONE	
2	**Red Beacon Operation**
off	OFF
on	Red beacon flashes in NIGHT

Catenary

These switches permit to select the catenary mode of the PCU:

SWITCH ONE		
3	**4**	**Catenary Mode**
off	off	none
on	off	middle
off	on	top
on	on	bottom

Soft ON

This switch enables the soft ON mode of the beacon mimicking an incandescent lamp turning ON and OFF. Red mode only.

SWITCH ONE	
5	**Soft ON**
off	OFF
on	ON

US/Canada

This switch selects FAA compliant L-865 and L-866 modes or TC compliant CL-865 and CL-866 modes.

SWITCH ONE	
6	**Compliance**
off	US
on	CANADA

Marker Quantity

The following DIP switches permit to select the quantity of markers connected to the PCU. The quantity is entered in binary. The following table shows the weight of each switch. Switches set to ON add up to set the desired marker quantity.

SWITCH TWO	
Switch	**Weights**
1	1
2	2
3	4
4	8
5	16

For example if 2 markers are used, switch SW2-2 is set to ON, other switches are set to OFF.

If 10 markers are used, switches SW2-4 and SW2-2 are set to ON, other switches are set to OFF.

A maximum of 31 markers can be used with all switches set to ON.

NOTES:

1. When all switches are set to OFF, the marker output is disabled.
2. When only SW2-1 is set to ON, the marker output is enabled but there is no marker fault detection.
3. Double marker units are seen as two.

Marker Flash

This DIP switch sets the markers to lit solid or flashing.

SWITCH TWO	
6	**Flash**
Off	ON solid
On	Flash

WFPM

This DIP switch is not used.

Flash Delay

In some cases, it may be required to delay the start of the flash by a specific time delay after a GPS synchronization pulse. The system can insert a delay of up to 5110 milliseconds in 10ms increments.

The Flash Delay DIP switch permits access to the flash delay functionality of existing DIP switches. It acts as a SHIFT key on a standard computer keyboard, thus changing the original function of the DIP switches to a Flash Delay function.

The delay is programmed using 9 dip switches as per the table below. Each bit has a weight of 10 milli-second. The following procedure must be followed:

1. Turn-off the PCU.
2. Set the switch SW2-8 Flash Delay to ON.
3. Turn on the PCU. Markers and SNMP communication will be disabled. System will flash according to the photocell mode.
4. All other switches are remapped to set the flash delay according to the table below. Set the desired flash delay. Note that the delay can be tweaked with the control PCU remaining ON.
5. When the desired delay has been achieved, turn-off the PCU.
6. Set the switch SW2-8 Flash Delay to OFF.
7. Set all switches to their original setting.
8. The PCU can be turned ON. It will resume normal operation using the specified flash delay.

SWITCH TWO	
8	**Delay**
Off	Unit uses programmed delay. Default is 0.
On	Unit in delay configuration mode.

The delay is entered in binary. The following table shows the weight of each switch. Switches set to ON add up to set the desired delay.

Switch	Weights
SW2-1	10 ms
SW2-2	20 ms
SW2-3	40 ms
SW2-4	80 ms
SW2-5	160 ms
SW2-6	320 ms
SW2-7	640 ms
SW1-1	1280 ms
SW1-2	2560 ms

For example if a 20 millisecond delay is required, switch SW2-2 is set to ON, other switches are set to OFF.

If a delay of 670 milliseconds is required, switches SW2-7, SW2-2 and SW2-1 are set to ON, other switches are set to OFF.

Note that when Flash Delay is ON, the markers are not energized and not monitored. The diagnostic LED will flash yellow at 4Hz.

Flash per Minute

These DIP switches set the **red** beacon flash rate.

SWITCH THREE		
1	**2**	**Flash Rate**
Off	Off	20
On	Off	30 (Default)
Off	On	40
On	On	60

Flash duty cycle

These DIP switches set the **red** beacon flash duty cycle.

SWITCH THREE		
3	**4**	**Duty Cycle**
Off	Off	16.7%
On	Off	51% (default)
Off	On	66%
On	On	100% (steady burn)

SNMP Address

These DIP switches set the SNMP address of the PCU. **In a single PCU system, the address must be set to '1'**. In a multiple PCU system, the master PCU must be at address '1' and the slaves must be set to an address between '2' and '15'.

The SNMP Address is binary coded.

SWITCH THREE				
8	**7**	**6**	**5**	**SNMP Address**
Off	Off	Off	Off	SNMP OFF
Off	Off	Off	On	1
Off	Off	On	Off	2
Off	Off	On	On	3
Off	On	Off	Off	4
.	.	.	.	.
On	On	On	On	15

Beacon

The beacon contains a LED based light source that produces the white and red flashes. These LEDs are precisely placed in optical modules to produce a very sharp 3˚ beam of light. Great efforts have been put in the design of these modules to minimize ground scatter light to almost zero. To increase durability, LEDs are directly placed on an oversized aluminum heat sink which keeps them cool at all times.

Photocell

A solid-state photocell continuously senses outdoor illuminance to properly adapt to changes in the light intensity. It enables the system to switch between *day* and *night* modes as per the applicable standard on ambient light intensities. The automatic photoelectric control is factory calibrated and will never require further adjustments. It is constantly monitored for proper operation by the PCU.

The photocell must be installed facing north in the Northern Hemisphere. The photocell dimensions are supplied in appendix. In a multi PCU installation, only the master requires a photocell.

NOTE: Do not daisy chain the photocell with other units.

GPS receiver

An optional GPS receiver/antenna can be connected to the PCU to synchronize multiple beacons that are too distant from each other to be connected with wires.

By default the PCU flash sequence is free running. When a GPS signal is acquired, the time information is analyzed and the flash sequence is synchronized with the zero second of the minute.

The 'GPS' indicator flashes when the PCU is waiting for the GPS signal and is lit solid when a GPS signal is acquired. The GPS receiver should be connected to the MASTER PCU in a multi PCU system.

Synchronization

An optional synchronization port is provided for multi PCU system. This port enables synchronization and other information to be communicated between the master PCU and the slaves.

SNMP Enabler

An optional SNMP interface provides the ability to control and monitor the PCU from a remote location. It allows for total control of the PCU mechanisms, and in some cases override on-board DIP switches.

Operation

Safety interlock switch

The interlock switch is opened when the door of the PCU is opened. This action switches the PCU & beacon OFF. After 30 seconds, no voltage above 50 volts remains in the unit.

Initialization

The PCU is designed to operate unattended and maintenance free. It must however be initialized when originally installed on location, with the beacon and the markers properly mounted on the tower, the mast or the building.

The initialization will match the beacon and the markers to the PCU. If the "CALIB" indicator is flashing in red, the system has not been initialized. Please refer to the Initialization sections.

Day & night mode

The PCU automatically flashes the beacon at the right intensity according to the outdoor illuminance. In *day* mode the beacon flashes in white. When night time is detected by the photocell, the beacon produces white or red flashes as configured.

Indicator lights marked "DAY" and "NIGHT" confirm the system operating mode.

In case no photocell is detected or the photocell readings stay in DAY or NIGHT for more than 18 hours, the PCU will automatically generate a photocell alarm and switch to *day* mode until the problem is solved.

Automatic and manual mode

This PCU has two main modes of operation; *automatic* and *manual*. When in *automatic* mode, the PCU is running unattended and switches from *day* to *night* (and vice-versa) automatically by reading the photocell data.

The ***manual*** mode can be used to force *day* or *night* mode temporarily or permanently. The *manual* mode is useful to test proper operation of the system.

To ***temporarily*** switch to *day* mode, press the button marked "DAY". The day mode indicator will blink slowly. After 5 minutes the system returns to *automatic* mode.

To ***temporarily*** switch to *night* mode, press the button marked "NIGHT". The night mode indicator will blink slowly. After 5 minutes the system returns to *automatic* mode.

To ***permanently*** switch to *day* mode, press the button marked "DAY" for more than 5 seconds. The day mode indicator will blink fast. The PCell Alarm indicator will turn on to indicate that the photocell is overridden.

To ***permanently*** switch to *night* mode, press the button marked "NIGHT" for more than 5 seconds. The day mode indicator will blink fast. The PCell Alarm indicator will turn on to indicate that the photocell is overridden.

To switch to *auto* mode, press the button marked "AUTO". The system will read the photocell and switch to either day or night accordingly. The day or night mode indicators will light solid to show the current mode.

Synchronization, Master/Slaves

Multiple PCUs can be synchronized together using Technostrobe's synchronization cables. When in synchronization, the beacons flash at the same time.

In a system where multiple PCUs are used, the photocell connection defines which PCU is the MASTER. The other PCUs must not have photocells connected and are named SLAVES. The MASTER PCU forces the flash sequence for the SLAVE PCUs.

Note that the MASTER should be at SNMP address '1' and the SLAVES at SNMP addresses between '2' and '15'.

Remote Reset

It is possible to remotely cycle the power to the PCU in order to perform a reset using one of the methods below:

- Through SNMP
- Through the HTML interface
- Through an external Remote Monitoring System (RMS) which provides a 12Vdc signal to energize a relay, marked REMOTE RESET 12Vdc, located on the main PCU board – See PCU Components section.

Photocell status relay

A contact is provided to indicate the photocell status (Day/Night)

Open = Day mode
Closed = Night mode

Markers

This PCU can power and monitor up to (31) L-810 or CL-810 markers (obstruction lights). The markers are powered with the same voltage as the input power. The markers must be initialized to ensure unattended and maintenance free operation. Please refer to the Initialization sections.

WARNING: The MARKER OUT voltage is following the POWER IN voltage. Only use markers rated to the POWER IN voltage.

Communication Module

An optional communication module can be added to the PCU to provide remote control and monitoring through the standard cellular network.

Monitoring and alarms

The PCU provides multiple means of monitoring its operation. Monitoring can be done with any of the following methods:

- Onboard indicator lights
- Onboard dry contacts relays
- Onboard HTML with the optional SNMP Enabler
- Via Simple Network Management Protocol (SNMP) with the optional SNMP Enabler.

Indicator lights are described in the System Component section. The HTML and the SNMP functionality is described in the SNMP Programming Manual.

Dry Contact Relays

The PCU provides six relays to enable dry contact monitoring and status. Each relay is SPDT with NO and NC contacts. NO is normally open when there is NO ALARM. NC is normally closed when there is NO ALARM. Note that the contacts are rated 24V / 2 amperes maximum. The table below provides a description of possible alarms or status:

US version with 5 alarm relays:

Relay	Indicates an alarm when
Power	The PCU is not powered
Day	The DAY beacon is not connected properly
	The DAY beacon wire is shorted
	The DAY beacon is damaged and does not flash with sufficient intensity
	The PCU has internal damage
Night	The NIGHT beacon is not connected properly
	The NIGHT beacon wire is shorted
	The NIGHT beacon is damaged and does not flash with sufficient intensity
PCell	The photocell is not connected
	The photocell is shorted
	The photocell has not changed mode in more than 18 hours
Marker	Markers are not connected
	Markers are shorted
	One or more markers have stopped working

There is an additional photocell status relay:

Relay	Indicates status
PCell Status	Open = day Closed = night

Installation

Power & Control Unit Mounting

Mount the PCU where there is some clearance around the enclosure especially at the bottom where cables enter the control cabinet. Mount the PCU in an upright position and preferably at eye level for easy access.

If the PCU could be exposed to rain or snow, use watertight connections for each cable entering the enclosure.

Photocell Mounting

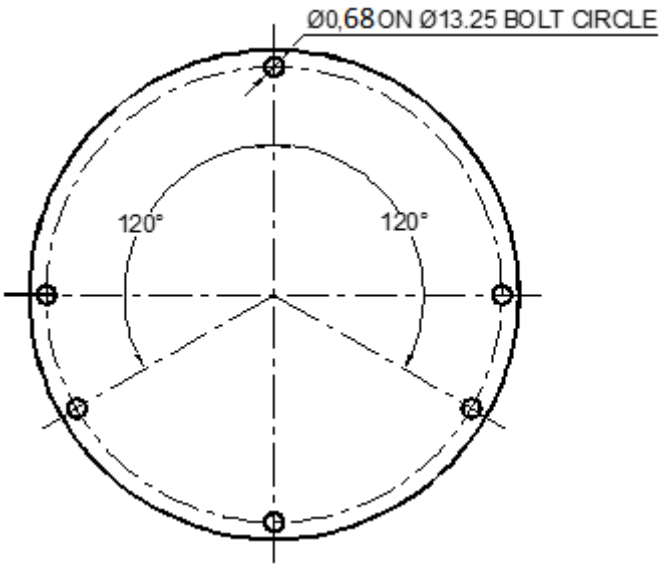
Mount the photocell in a way to get an unobstructed view of the north sky. It must not receive direct sunlight or be exposed to any artificial lighting.

GPS

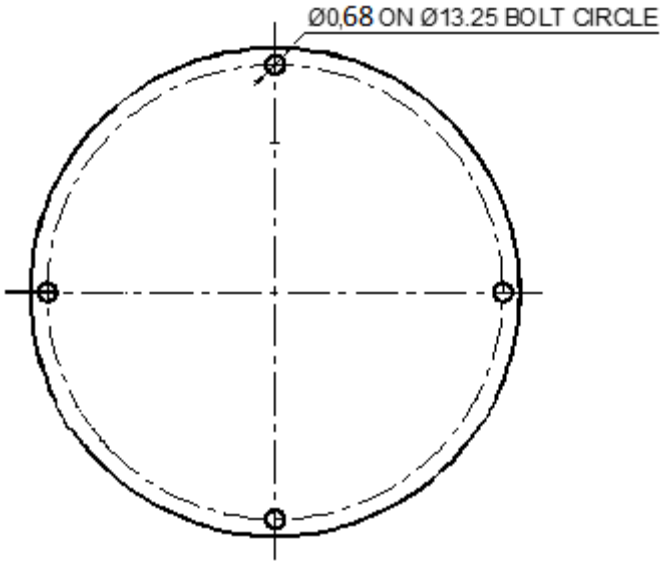
The GPS receiver should be installed horizontally on a flat surface with the round face up. There should be no satellite signal obstructions between the GPS receiver and the open sky (no metallic material).

Beacon Mounting

The beacon gen 4 is provided with 6 mounting holes to fit most installations. Below, a picture is detailing the layout of these holes. The beacon should be installed level to maintain light output specifications as required by applicable standard.



The beacon gen 5 is provided with 4 mounting holes to fit most installations. Below, a picture is detailing the layout of these holes. The beacon should be installed level to maintain light output specifications as required by applicable standard.



Wiring diagram

Interconnection diagrams are included in the appendix section.

Photocell Wiring

Connect the photocell to the PCU according to the wiring diagram. Please note that the photocell has no polarity.

Do not connect any other photocell than the one supplied by Technostrobe. Connecting a 3-Wire 120Vac photocell would permanently damage the PCU.

Beacon Wire Gauge

Total cable length from PCU to beacon	Minimum wire gauge
0 meter to 177 meters (0 ft to 583 ft)	16 AWG
177 meters to 300 meters (583 ft to 984 ft)	14 AWG
300 meters to 480 meters (984 ft to 1577 ft)	12 AWG

Beacon Wiring

A cable with 2 conductors 16 AWG minimum is required for the beacon connection, see table above. Connect one end of this cable to the beacon and the other end to the junction box or the beacon output position in the PCU. Refer to the wiring diagram.

Do not connect 120VAC or 240VAC circuit directly to the beacon. That would permanently damage the beacon.

If armored cable (TECK) is used, you must make a loop with the cable before connecting it to the beacon or a junction box. It is also recommend to make a loop at each hoisting grip.

Power Wiring

Connect the power to the PCU using 12 AWG conductors. Use a circuit with 2A to 15A current protection. Refer to the wiring diagram.

Initializing PCU

1. Open the door of the PCU.
2. Turn on the associated circuit breaker.
3. Pull the interlock switch.
4. Wait for the beacon and the "Flash Confirm" indicator to begin flashing.
5. If markers are used, select the quantity of markers and press the NIGHT button. Note that a Double Obstruction Light (DOL) counts for 2 marker lights. Verify all the markers are lit by looking at them.
6. Press the NIGHT button and verify that the beacon flashes at the desired flash rate and color, and that the flash confirm indicator flashes.
7. Press the DAY button and verify that the beacon flashes, and that the flash confirm indicator flashes.
8. Initialize the beacon and marker alarm by pressing the DAY and NIGHT buttons simultaneously. The indicators will flash sequentially. After 5 minutes the CALIB indicator will turn GREEN.
9. Press the button AUTO. The system will now read the photocell to select DAY or NIGHT operation accordingly.
10. Put your hand or black tape in front of the photocell to block all light entering the photocell. Wait 120 sec. and verify that the indicator light marked "NIGHT" is lit solid.
11. Remove your hand or the black tape off the photocell and make sure there is light directed at the photocell to simulate day time. Wait 120 sec and verify that the indicator light marked "DAY" is lit solid.
12. Remove obstruction in front of the photocell. If an alarm indicator lights, please use the troubleshoot section to identify and correct the problem. Otherwise the system is now working correctly and can be left unattended.

Diagnostics

Two field diagnostic options are available to help identify a problem.

Option #1 – Removes all delays and advanced features of the system, so troubleshooting can be performed quickly.

Option #2 – Is a sequence of generated alarms to confirm each alarm is working properly with the NOC.

Current Mode	DAY + AUTO pushbuttons	Diagnostic Indicator	New Operational Mode Entered
Auto or Day or Night	Pressed Momentarily **Once**	Flash 1 HZ in YELLOW	Option #1: No delays on alarms
Auto or Day or Night	Pressed Momentarily **Twice**	Flash 4 HZ in YELLOW	Option #2: Go through all operational modes. Step with AUTO

Option #1

It is invoked by pressing the DAY and AUTO pushbuttons simultaneously momentarily. When running, the diagnostic indicator will flash yellow. The sequences will automatically exit and normal operation will resume after 10 minutes, or when pressing the DAY and AUTO pushbuttons simultaneously momentarily.

Option #2

It is invoked by pressing the DAY and AUTO pushbuttons simultaneously twice. When running, the diagnostic indicator will flash yellow. The sequences will automatically exit and normal operation will resume after 10 minutes of inactivity, or when pressing the DAY and AUTO pushbuttons simultaneously momentarily. Once invoked, the user goes through the steps by pressing the AUTO pushbutton.

Option #2 steps:

1. Option #2 is invoked. All indicators are flashing
2. Enters day mode and flashes in white day
3. Enters in White beacon alarm status. Stops flashing
4. Clears White beacon alarm
5. Enters night mode and flashes in red night
6. Enters in Red beacon alarm status. Flashes in white night (backup mode)
7. Enters in White beacon alarm status. Stops flashing
8. Clears White beacon alarm
9. Clears Red beacon alarm
10. Enters in Photocell alarm status
11. Clears Photocell alarm
12. Enters in Marker alarm status
13. Clears Marker alarm
14. PCU resumes normal operation.

Notes:

1. The PCell Status relay will follow each mode.

2. The Power alarm can be tested by turning the unit OFF.

User Serviceable Parts

The LED-B-HYBRID-G5 is a 2-part system consisting of a PCU and a beacon. Should a malfunction require a repair, please contact customer and technical services at our toll free number: 800-732-9526 to get help. Your exact unit model is identified on the front of the unit for a PCU, or on an optical module if a beacon. A unit model must be replaced with the same unit model. For reference, the table below lists the existing models:

Type	Model	Description
Beacon	LFHMWRO-G4	Standard white/red beacon
	LFHMWRO-G5	Standard white/red beacon
Power & Control Unit	LCMWRO-G5-3MI	120/240 Vac power supply unit TC
	LCMWRO-G5-24-48-3MI	24/48 Vdc power supply unit TC
	LCMWRO-G5-3MI-USA	120/240 Vac power supply unit FAA
	LCMWRO-G5-48V-3MI-US	24/48 Vdc power supply unit FAA
	LCMWRO-G5-3MI-RMS-US	120/240 Vac power supply unit FAA RMS

Troubleshooting Chart

SYMPTOM	TROUBLESHOOTING
System does not switch between DAY and NIGHT	It is possible to test the photocell by measuring its electrical resistance with an ohmmeter or a multimeter. Disconnect the photocell from the PCU before testing. During day time, the photocell should have a resistance of less than 3 KOhm. During night time, it should read over 6 KOhm.
The POWER ALARM relay is tripped. The heartbeat LED indicator does not flash.	Is the system powered ON? Verify presence of mains on terminal block. Verify all fuses. If a replaced fuse blows immediately, or if fuses are OK and the POWER ALARM relay is still tripped, call Technostrobe's customer support for more guidance.
The BEACON alarm LED indicator is ON.	Is the beacon connected properly? If it is connected properly at the terminal block, this may indicate a

SYMPTOM	TROUBLESHOOTING
The BEACON ALARM relay is tripped.	beacon failure or a cabling fault. A resistance below 10 ohms indicates a short wire, probably in a junction box. A resistance above 600K ohms indicates an open wire, probably in a junction box. If the resistance is acceptable, the system may indicate a problem with the beacon. Call Technostrobe's customer support for more guidance.
The MARKER alarm LED indicator is ON. The MARKER ALARM relay is tripped.	Has the marker circuit been initialized? Initialize the circuit using instructions in the initializing section of this manual. If the system cannot initialize, set the DIP switches SW2-1 to ON, and SW-2, SW2-3, SW2-4 and SW2-5 to OFF. Visually verify that all the markers are lit. System should be in FORCED NIGHT. If it is initialized but showing the alarm when "Markers # Select" is set to the number of markers in the tower, this may indicate a marker failure or a cabling fault. Call Technostrobe's customer support for more guidance.
The PCELL/SYNC alarm LED indicator is ON. The PCELL ALARM relay is tripped.	If equipped with a photocell, is the photocell connected properly? Verify photocell connection at the terminal block. Disconnect photocell and verify that the photocell resistance is below 3 K ohms in a bright day. Verify that photocell is properly installed outside. This may happen because the photocell is constantly reporting DAY or NIGHT. Verify that the photocell has free access to daylight (paint, bird droppings) and free access to night light (new sentinel light in the area may be perceived as the sun) In a master/slave setup, the slave may not receive synchronisation information from the master. Is the master PCU ON? Are both systems connected with the SYNC cable? Master and slave must have a different SNMP address set on the DIP switches. Master is typically at 0001.

SYMPTOM	TROUBLESHOOTING
The beacon does not come on and the system reports no error.	Is the photocell in NIGHT mode? Verify that photocell is properly installed. Try forcing the system in NIGHT using the NIGHT button. Try setting the DIP switches at their default position.
Markers do not come on and the system reports no error.	Are the DIP switches properly set? If the "Marker # Select" is set to 00000, the markers are switched OFF. Try setting the DIP switches at their default position and set "Marker # Select" to 1. (Irrespective of the number of markers on the tower), this turns ON the markers. Verify that the markers are lit. Unplug the markers from the MARKERS terminal block and plug them to the system mains supply. Respect the input voltage of the marker. Verify that the markers are lit.
System reports a GPS alarm. GPS fail to sync.	Is the GPS positioned properly and has an unobstructed view of the sky? Is the GPS connected properly? The GPS connector is delicate. Is there a bent pin? Was the GSP cable extended?

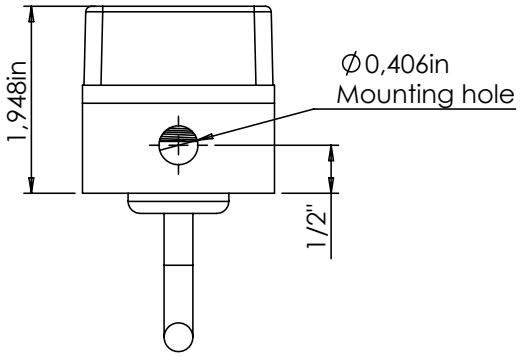
Appendix table

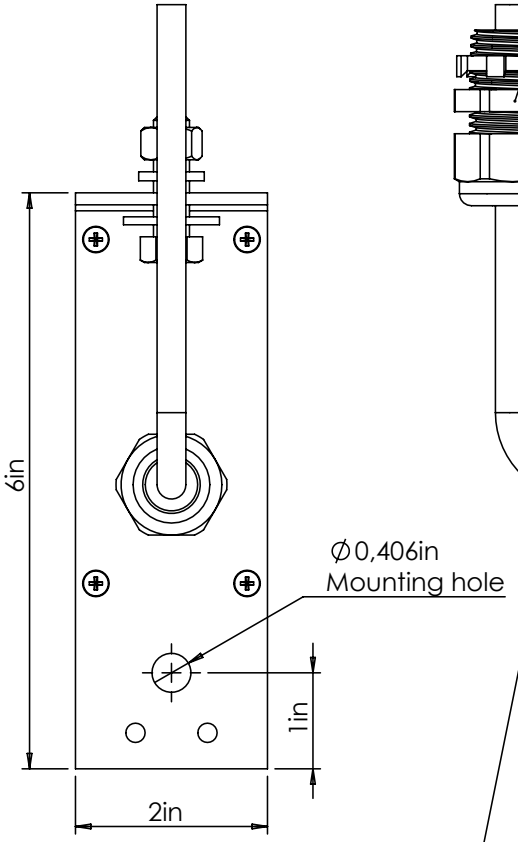
Doc No.	Title	Page qty
DOC-8558e	Photocell Dimensions	1
DOC-8617e	LED Beacon Controller Dimensions	1
DOC-8608e	LED Beacon Dimensions	1

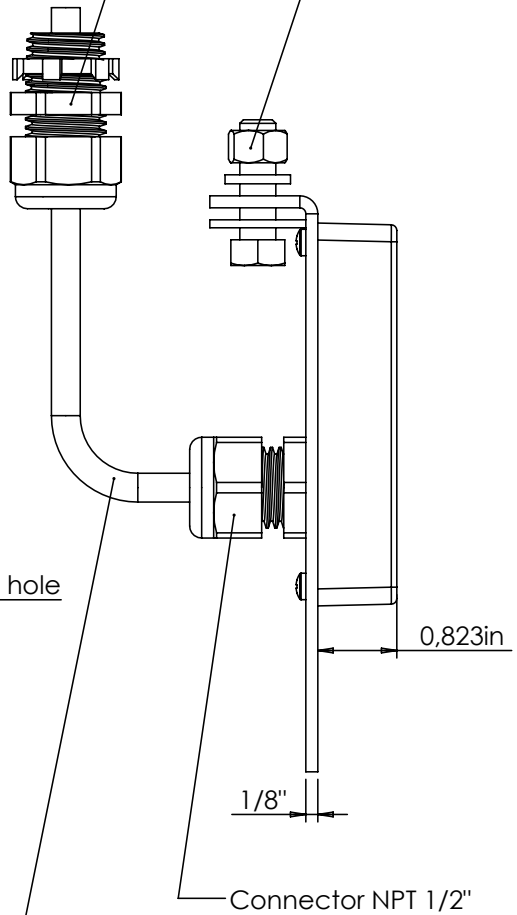
E2 Type tower – Single enclosure

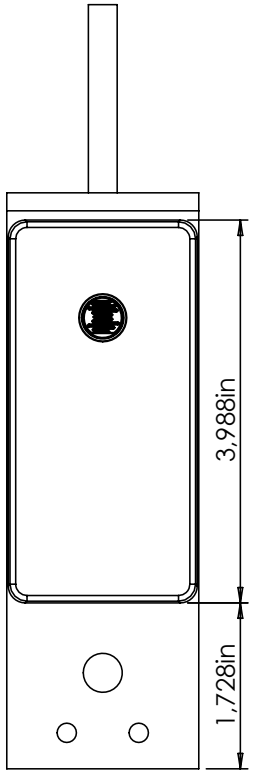
4432-3	Interconnection diagram	1

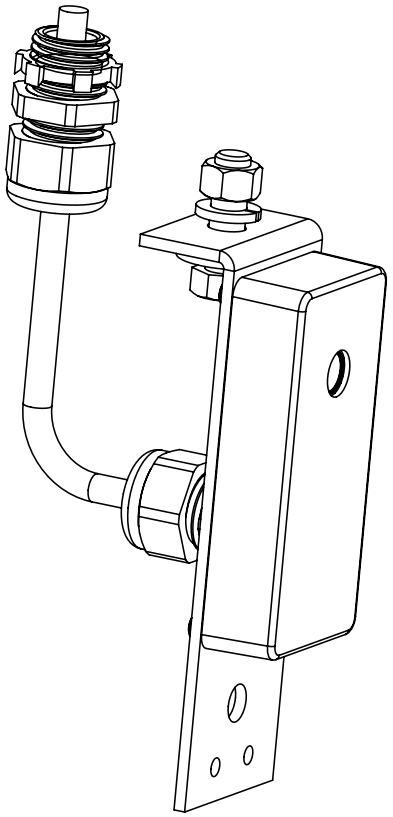
REVISIONS		
REV.	DESCRIPTION	DATE
0	INITIAL RELEASE	2015-05-11











PEC-03

DRAKE LIGHTING
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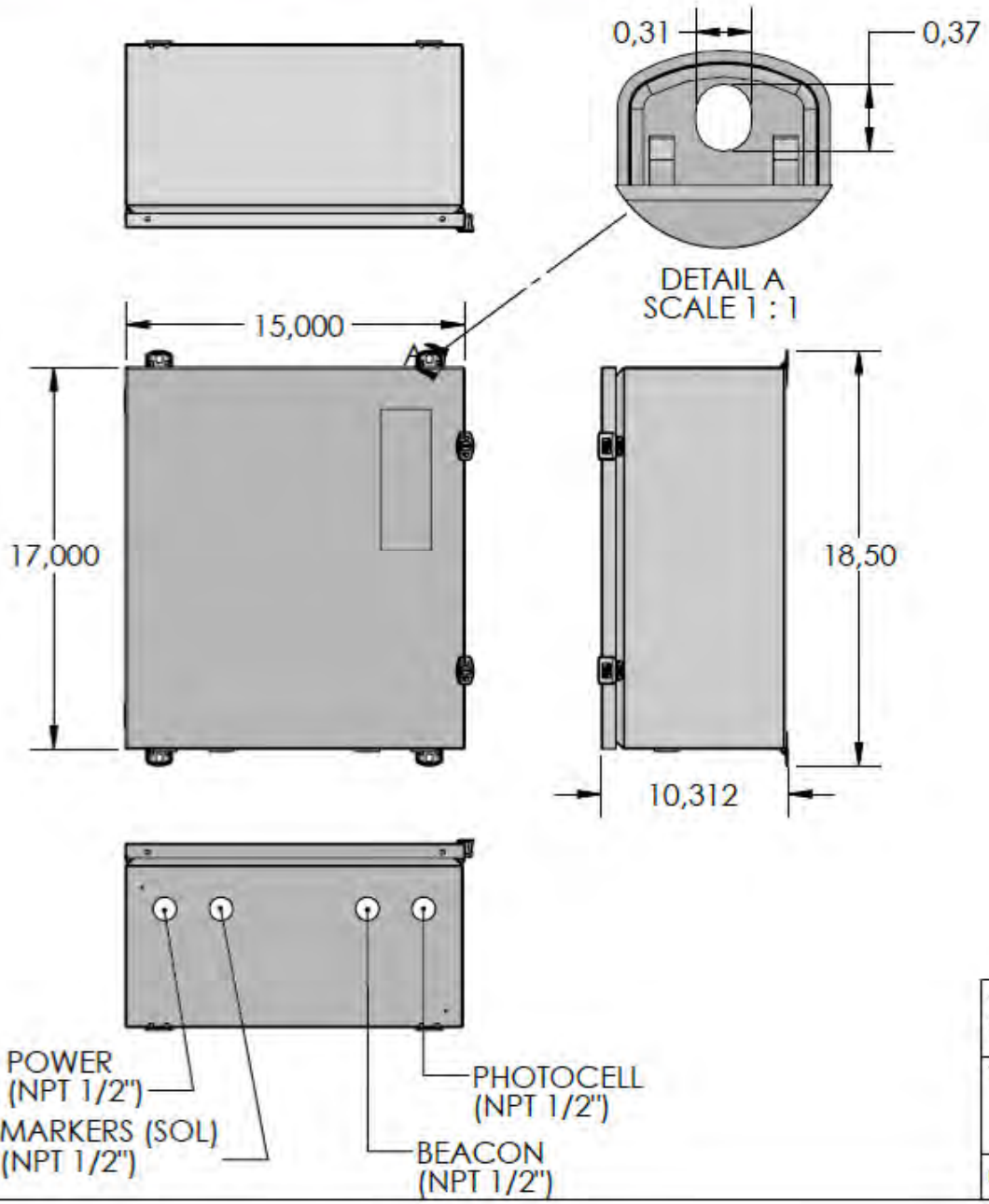
P.O. Box 508
1213 Compressor Drive
Mayfield KY 42066

Title: PHOTOCELL DIMENSIONS (P/N: PEC-03)

Document # : DOC-8558e REV : 0

- The controller must be installed on a vertical surface.
- It can be installed indoors and outdoors.
- Requires 4 fasteners of ¼'' diameter.
- You must provide a clearance at the bottom and on the sides of the box so that you can "route" the connection cables.

REVISIONS		
REV.	DESCRIPTION	DATE
0	INITIAL RELEASE	04-03-2020



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P.O. Box 508
1213 Compressor Drive
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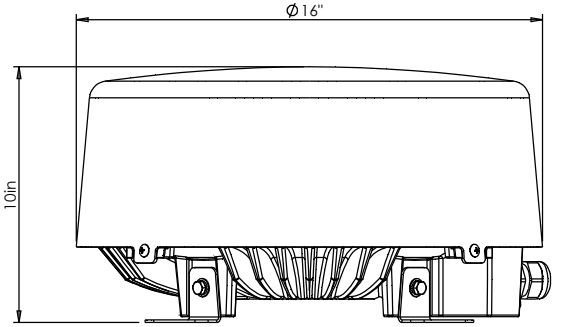
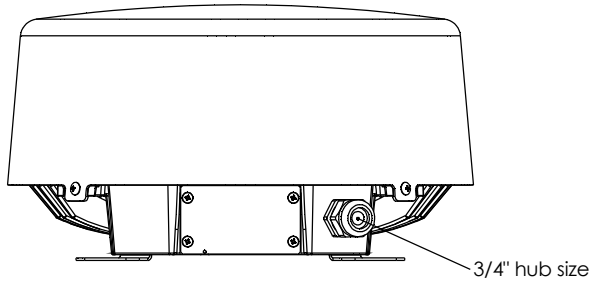
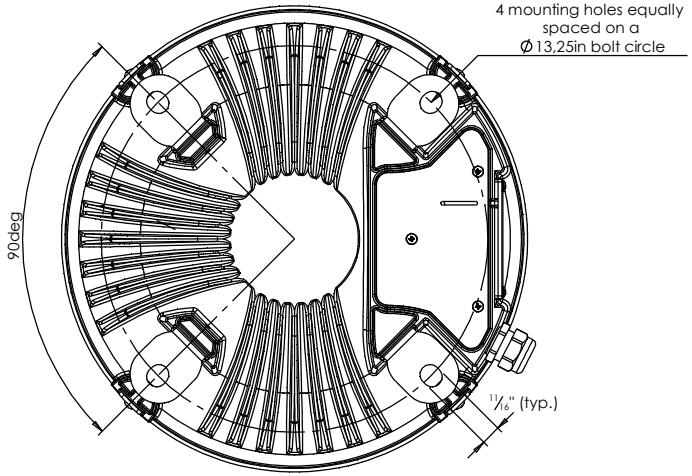
Title: LED BEACON CONTROLLER DIMENSIONS (M.I.) - PAINTED STEEL ENCLOSURE

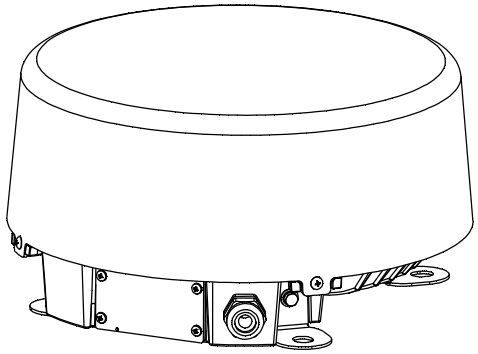
Document # : DOC-8617e REV : 0

REVISIONS		
REV.	DESCRIPTION	DATE









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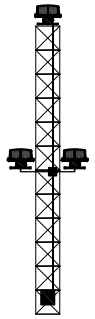
Title: LED Beacon Dimensions (LED-B-Hybrid-G5)

Document # : DOC-8608e REV : 0

Configuration name: Default

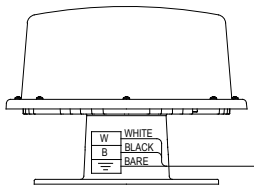
NOTES:

TOWER TYPE



E2

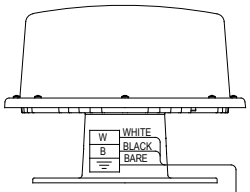
LFHMWRO



BEACON 3

2C/14AWG

LFHMWRO



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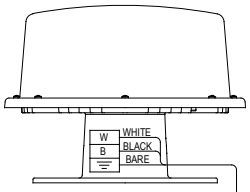


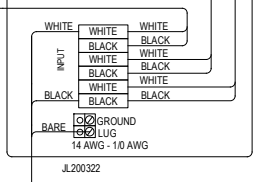
2C/14AWG

BEACON TERMINAL BLOCKS ACCEPT UP TO 12 AWG.
BEACON CABLE INPUT : 3/4" NPT.

JUNCTION BOX #

BEACON 2

BEACON 1



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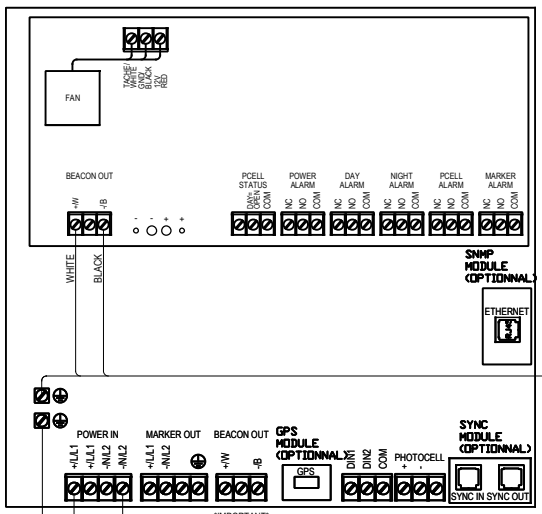
2C/14AWG



120Vac 60Hz-15A CIRCUIT FROM
ELECTRICAL PANEL 49-PLEM-8
LOAD REQUIREMENT : 90VA
CABLE ENTRY SIZE : ½" NPT

2C/14AWG

Revision #	Description	Date
1	INITIAL REVISION	August 16, 2019
2	UPDATED PSU	October 16, 2019
3	NOTE FOR BEACON OUT	DEC 2, 2019
4	CHANGED TOWER TYPE ILLUSTRATION	DEC 9, 2019
5	BEACON OUT IS ON TOP PCB	FEB 19, 2020

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1213 Compressor Drivce
Mayfield KY 42066

Drawn by : G.M.

Scale : N/A

Title : INTERCONNECTION DIAGRAM FOR OBSTRUCTION LIGHTS CL-865/864 FOR 3MI SYSTEM

Format : N/A | Drawing # : 4432-3 | Revision : 5 | Sheet : 1/1

2000 McCracken Blvd.
Paducah, KY 42001

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