CIMCON LIGHTING, INC.

LightingGale Application

Troubleshooting Guide

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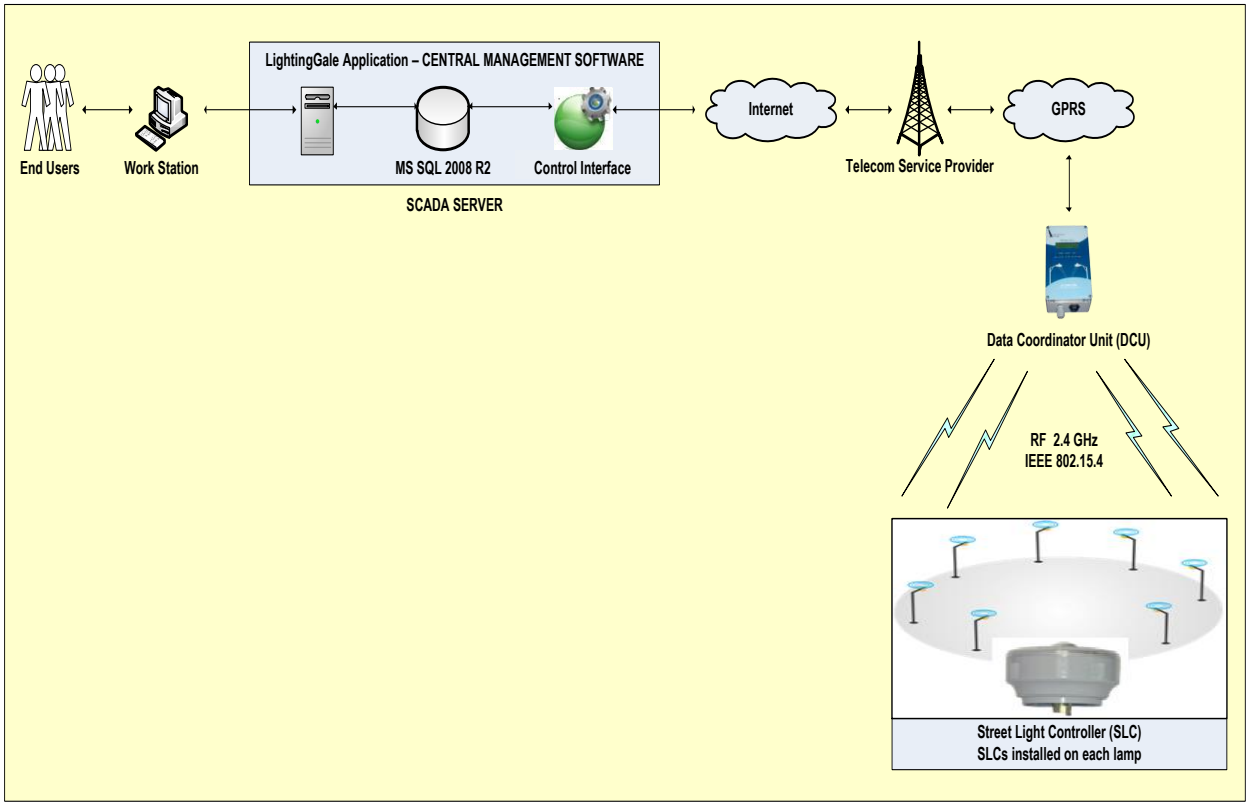
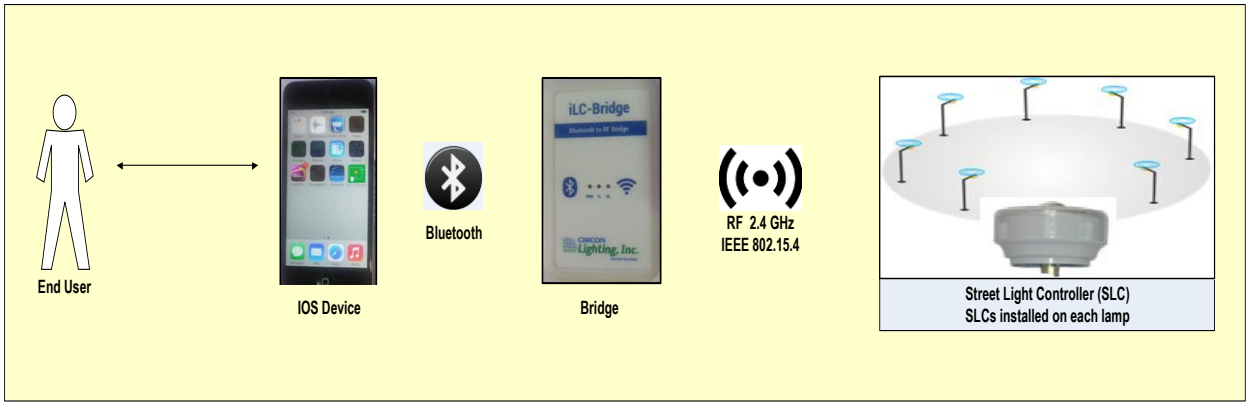
How to Communicate with SLCs

The following three methods can be used to communicate with SLCs,

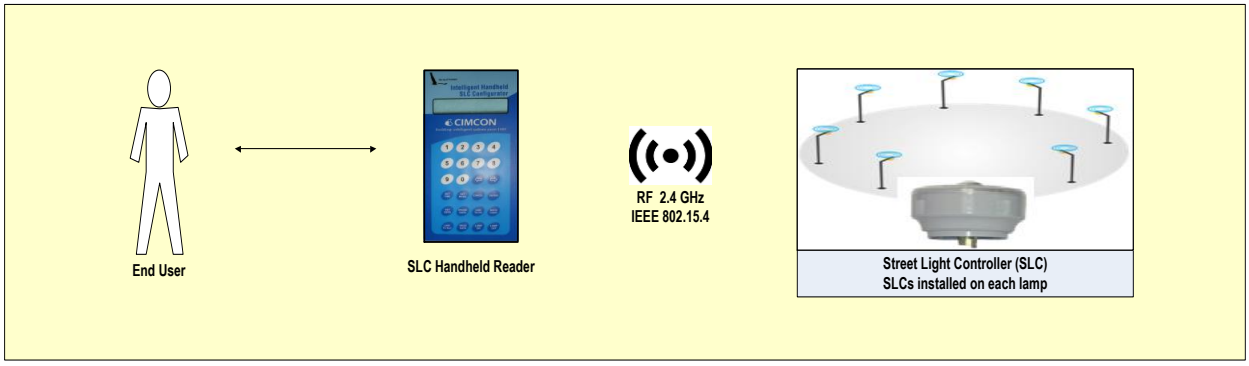
1. **Central Management Software–LG Application**: By using this method, user can communicate with SLCs via DCU. Communication between LG Application and SLCs is bidirectional. LG Application sends command messages to DCU via Control Interface Windows Service. When DCU receives command messages, it sends Acknowledgment message back to C.I. Then DCU sends requested message further to SLC and waits for some time to get response from SLC. Once DCU receives data message from SLC, it sends that message to LG via C.I.



2. **SLC Connect–IOS Application**: By using this method, user can communicate with SLCs via Bridge. Communication between SLC Connect and SLCs is bidirectional. SLC Connect, IOS Application, communicates with Bridge via Bluetooth and then Bridge communicates with SLCs via RF network.

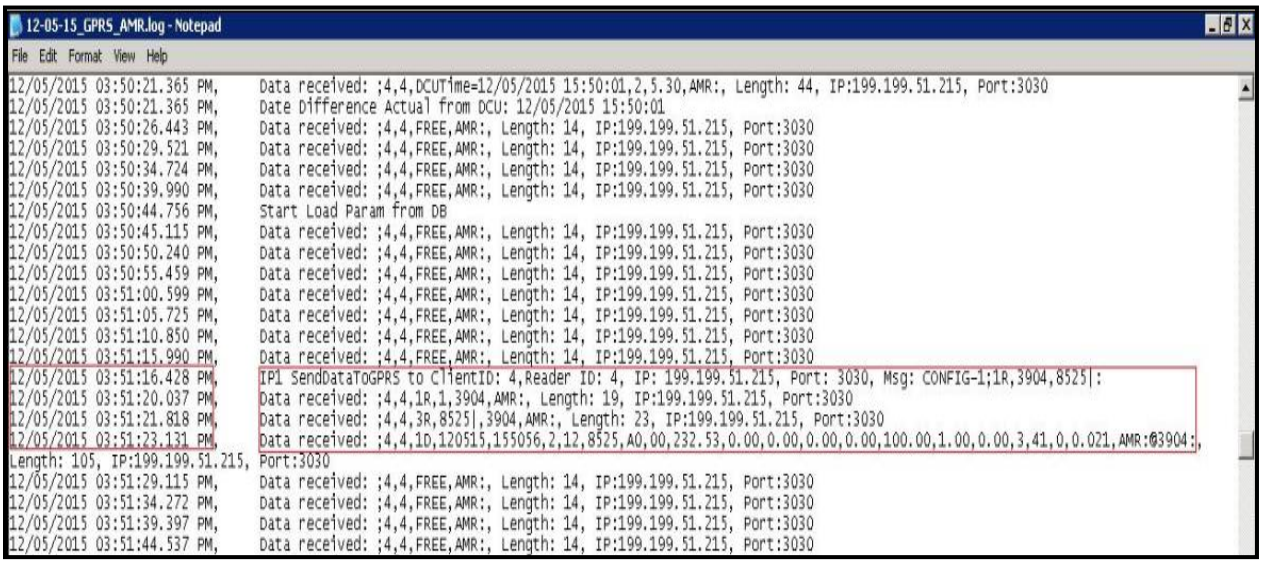


3. **SLC Handheld Reader**: By using this method, user can communicate with SLCs during commissioning phase also. Communication between SLC Handheld Reader and SLCs is bidirectional. SLC Handheld Reader communicates with SLCs via RF network.



Flow of messages between Control Interface and DCU

Flow of data string messages between CI and DCU could be seen in "**GPRS_AMR**" log file which is located at path "**C:\CIMCON Software Inc\LightingGale Control Interface Service\Log**" in machine where Control Interface Windows Service is installed.
"**GPRS_AMR**" log file is used to diagnose a communication link failure in data flow structure of LightingGale Application. "**GPRS_AMR**" log file shows date and time at which CI sent data string of command message to DCU and received data strings of Acknowledgement message from DCU and requested data message from SLCs via DCU.



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12-05-15_GPRS_AMR.log - Notepad
File  Edit  Format  View  Help
12/05/2015 03:50:21.365 PM,     Data received: ;4,4,DCUTime=12/05/2015 15:50:01,2,5.30,AMR:, Length: 44, IP:199.199.51.215, Port:3030
12/05/2015 03:50:21.365 PM,     Date Difference Actual from DCU: 12/05/2015 15:50:01
12/05/2015 03:50:26.443 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:50:29.521 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:50:34.724 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:50:39.990 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:50:44.756 PM,     Start Load Param from DB
12/05/2015 03:50:45.115 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:50:50.240 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:50:55.459 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:00.599 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:05.725 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:10.850 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:15.990 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:16.428 PM,     IP1 SendDataToGPRS to ClientID: 4,Reader ID: 4, IP: 199.199.51.215, Port: 3030, Msg: CONFIG-1;1R,3904,8525|:
12/05/2015 03:51:20.037 PM,     Data received: ;4,4,1R,1,3904,AMR:, Length: 19, IP:199.199.51.215, Port:3030
12/05/2015 03:51:21.818 PM,     Data received: ;4,4,3R,8525|,3904,AMR:, Length: 23, IP:199.199.51.215, Port:3030
12/05/2015 03:51:23.131 PM,     Data received: ;4,4,1D,120515,155056,2,12,8525,A0,00,232.53,0.00,0.00,0.00,0.00,100.00,1.00,0.00,3,41,0,0.021,AMR:03904:,
Length: 105, IP:199.199.51.215, Port:3030
12/05/2015 03:51:29.115 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:34.272 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:39.397 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
12/05/2015 03:51:44.537 PM,     Data received: ;4,4,FREE,AMR:, Length: 14, IP:199.199.51.215, Port:3030
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WIFI Conflict Free Zigbee Channels

1. If WIFI Channels are 1, 6 and 11 then conflict free Zigbee channels to form RF network between DCU and SLCs are 14, 15, 19, 20, 24 and 25.
2. If WIFI Channels are 1, 7 and 13 then conflict free Zigbee channels to form RF network between DCU and SLCs are 15, 16, 21 and 22.

How to make SLCs visible in LG

1. Create LG instance for client.
2. Follow path **Home > SLCs > Import Data > Import SLC Data** to download SLC Import Sheet format from LG.

3. Fill the required fields in downloaded sheet. Make sure SLC Number, SLC Name, MAC Address and Lamp Type fields are filled otherwise, SLC will not be displayed in LG. Value in Gateway Name field could be filled later based on the user's requirement.
4. Import the list of SLCs sheet in LG.

SLC No.	SLC Name	Address	Gateway Name	MAC Address	Lamp Type
13749	13749		Gateway 1	000D6F0003B6C512	LED
13750	13750		Gateway 1	000D6F0003B6C0BD	LED
13751	13751		Gateway 1	000D6F0003B6C12B	LED
13752	13752		Gateway 1	000D6F0003B6C046	LED

How to make DCU active in LG

1. Create LG instance to get Client ID, Gateway ID and Live IP values which are needed to enter in DCU via Gateway Web Console.
2. Connect DCU with PC or laptop via Ethernet cable.
3. Need to change the PC or Laptop network settings according to DCU IP 192.168.1.100 to open DCU's web page,
4. PC or Laptop IP: 192.168.1.99
    a. Subnet Mask: 255.255.255.0
    b. Gateway IP: 192.168.1.1
    c. Network: 192.168.1.0
    d. Broadcast: 192.168.1.255
5. Once the Gateway Web Console page is open, enter Client ID, Gateway ID and Live IP values in DCU.
6. If communication type is GPRS then enter APN Name, this should be provided by the telecom service provider, for instance i2gold for AT&T, and then click submit button to save the settings in DCU.
7. If communication type is Ethernet then enter static IP information, which is received from IT persons of client, in DCU. Make sure to take screen shots of every web page for record.
8. When DCU is configured, ping the IP Address of DCU to check the connectivity link. If ping is coming and DCU started sending messages to Control Interface at regular interval of time then it means DCU is active.

ID	Gateway Name	Gateway Description	Protocol	Date - Time	Status	Gateway Operations
3	Gateway01		GPRS	08/20/2015 07:04:27 AM	✓	

How to make connectivity between DCU and SLCs

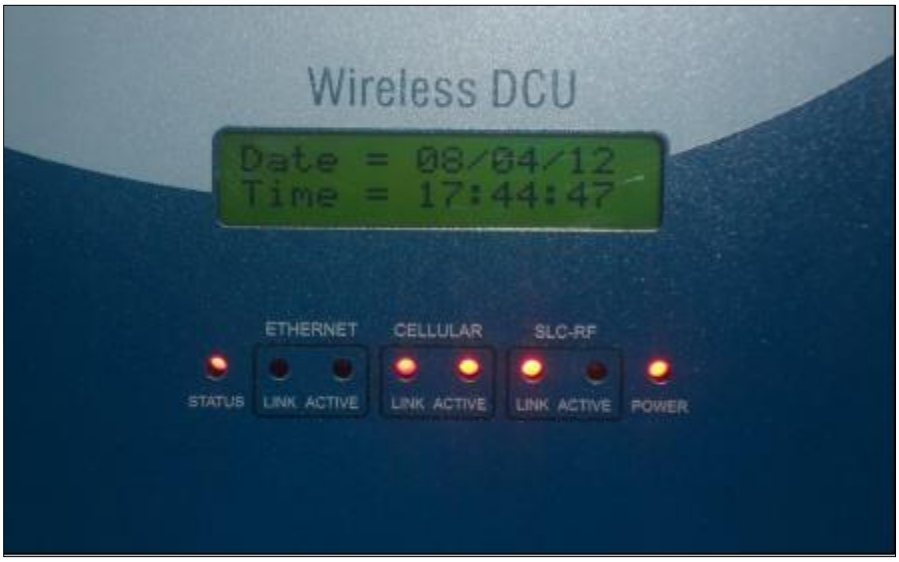
1. Once the DCU is showing active status in LG, follow the path **Home > Controls > Configure SLC > Set MAC Address** in LG to load MAC addresses of SLCs in DCU.
2. Make sure SLCs are turned ON at client's site.
3. When DCU is loaded with MAC IDs of SLCs, these SLCs will start sending ACTIVEMAC messages to DCU. This means SLCs are now active in DCU. The number of active SLCs in DCU can be seen either in Active SLCs field in web console page of DCU or in Hardware Initiated Commands submenu of Track Network Commands in LG.
4. Send unicast read data command to SLCs and check the current data of SLCs in Status menu of LG.

	SLC No.	SLC Name	Date - Time	Address	LS	LC	LCyc	C	B	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	673	SLC-673	08/20/2015 11:00:46	111 Park Avenue, Worcester, MA 01609, USA						124.16	0	0	20.08	208.39	100	1	Mixed Mode
	674	SLC-674	08/20/2015 11:00:50	154-166 Salisbury Street, Worcester, MA 01609, USA						124.75	0	0	20.64	217.12	100	1	Mixed Mode

How to make DCUs and SLCs visible in LG map view

1. Enter the Latitude and Longitude positions of DCUs in LG. Follow the path **Home > SLCs > Gateway List > Add Gateway**.
2. Enter the Latitude and Longitude positions of SLCs in LG.
    a. Latitude and Longitude values of SLCs can be captured via Handheld Reader in field. OR
    b. If SLCs are enabled with GPS feature then they automatically get their Latitude and Longitude values. Follow below steps,
        i. Once the SLCs are installed in the field, send Get Mode command to all SLCs from LG.
        ii. Latitude and Longitude positions of all SCLs will become visible in Set Latitude/Longitude menu in LG. Follow path **Home > Controls > Configure SLC > Set Latitude/Longitude** and update the Lat/Long values in LG. SLCs positions will be visible in map view menu in LG.
        iii. Make sure LG Address Detection service is running in backend. This will display address of each SLC in Status menu as well as in SLC List submenu in LG.

Functional Status LEDs of DCU



1. Power ON DCU.
2. Check the status of **POWER LED** on DCU. If it is ON continuously then DCU is powered ON.
3. Check the status of **STATUS LED**. If it is blinking, it means code is executing properly within DCU.
4. If communication type is ETHERNET. Check the status of **ETHERNET ACTIVE LED**. If it is blinking, it means DCU sends ping request to CMS server and in return receives ping response from CMS server. If it is OFF, it means DCU is not receiving ping response from CMS server.

5. If communication type is ETHERNET. Check the status of **ETHERNET LINK LED**. If it is ON, it means data transmit over Ethernet. If it is OFF, it means data receive over Ethernet.
6. If communication type is GPRS. Check the status of **CELLULAR ACTIVE LED**. If it is blinking, it means DCU sends ping request to CMS server and in return receives ping response from CMS server. If it is OFF, it means DCU is not receiving ping response from CMS server.
7. If communication type is GPRS. Check the status of **CELLULAR LINK LED**. If it is ON, it means data transmit over GPRS. If it is OFF, it means data receive over GPRS.
8. Check the status of **SLC-RF ACTIVE LED**. If it is blinking, it means DCU is connected with RF network.
9. Check the status of **SLC-RF LINK LED**. If it is ON, it means data transmit over RF. If it is OFF, it means data receive over RF.

How to resolve DCU's issues

If DCU is not showing active status in LG then reason could be anyone of the following,

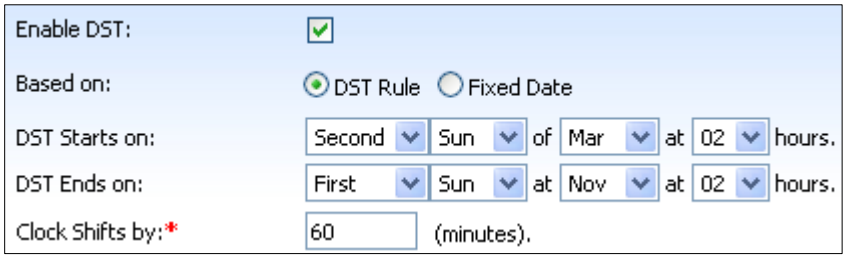
1. Check the power supply to DCU.
2. Check whether DCU is powered ON or not.
3. Check the Control Interface Service in CMS Server. If it is down then restart it.
4. Check the ping response of static IP address of DCU. If ping response is getting then web page of DCU should be accessible. Check the configuration settings in DCU like client ID, Gateway ID, Live IP values etc.
5. If ping response is not getting then
    a. If communication type is Ethernet then network issue at client site.
    b. If communication type is GPRS then reason could be anyone of the following,
        i. Insert SIM Card properly and then check whether registration OK message is coming or not. Registration OK message can be seen in capture file of HyperTerminal or in web console page of DCU or in log file of DCU.
        ii. Check the DCU compatibility with 2G and/or 3G SIM Card.
        iii. DCU with 2G feature consists of 1 Antenna socket (MTSMC – G2). Try to remove and place antenna back and then check ping response.
        iv. DCU with 3G feature consists of 2 Antenna sockets (MTSMC – H5). Try to remove and place antenna back and then check ping response.
        v. Check the status of SIM card at AT&T site. If status of card is not showing then coordinate with AT&T's officials.
6. If ping response is getting but not able to access web console of DCU then there are chances of hardware or software faulty issues in DCU.

How to set DST Rule in DCU and SLCs

To avoid time inconsistency, DST rule must be set in both DCU and SLCs through LG.

1. Follow path **Home > Controls > Get/Set System Parameters > Set Gateway DST Parameters** to set DST rule in DCU.
2. Follow path **Home > Controls > Get/Set System Parameters > Get Gateway DST Parameters** to check the DST rule set in DCU.
3. Follow path **Home > Controls > Get/Set System Parameters > Set SLC DST Parameters** to set DST rule in SLCs.
4. Follow path **Home > Controls > Get/Set System Parameters > Get SLC DST Parameters** to check the DST rule set in SLCs.
5. Once the DST rule is applied in DCU and SLCs, follow the path **Home > Controls > Configure SLC > Set Clock Synchronization** to set the RTC of DCU according to CMS time.
6. Send unicast read data commands to all active SLCs of DCU and check date and time values in Status page.
7. For instance, applicable DST rule in USA is
    a. DST Starts: **Second Sunday in March at 2 am**

b. DST Ends: **First Sunday in November at 2 am**
c. Clock Shift: **60 minutes**



Backend Services of LG Application

Make sure below mentioned Services are running in backend of LG Application. These Services are installed on CMS Server.

1. **LightingGale Address Detection Service**: This Service allows LG to display addresses of SLCs based on Latitude and Longitude positions of SLCs.
2. **LightingGale Control Interface Service**: This Service allows DCU to connect with LG Server.
3. **LightingGale Data Parsing Service**: This Service allows parsing of DCU and SLCs data in Database before displaying data in frontend of LG.
4. **LightingGale Report Scheduler**: This Service allows LG to display various reports based on the data received from DCU and SCLs in frontend.
5. **LightingGale Send Mail Service**: This Service allows LG to send email notifications to Users in case of issues observed in DCU and SLCs based on the Alarms Status of Channels in LG.

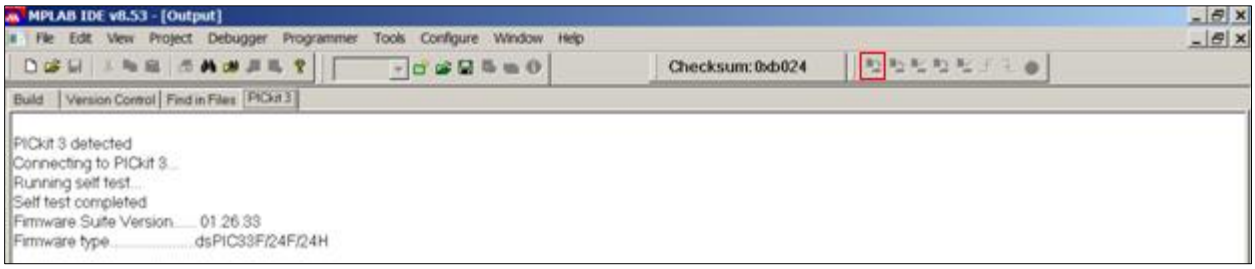
Name	Description	Status	Startup Type	Log On As
LightingGale Address Detection Service	LightingGale...	Running	Automatic	Local System
LightingGale Control Interface Service	LightingGale...	Running	Automatic	Local System
LightingGale Data Parsing Service	LightingGale...	Running	Automatic	Local System
LightingGale Report Scheduler	LightingGale...	Running	Automatic	Local System
LightingGale Send Mail Service	LightingGale...	Running	Automatic	Local System

How to setup Handheld Reader to detect SLCs and DCUs

1. Set Handheld Reader in PC Communication mode and then connect reader device with PC or laptop via serial cable. Make sure SLC Reader application is installed on PC or laptop.
2. SLC Reader Application must be set at
   a. Serial Port Name: Look into Device Manager in PC to get port number information.
   b. Baud Rate: 9600
   c. Data Bit: 8
   d. Parity: None
   e. Stop Bit: 1
3. Load SLCs information (SLC IDs and MAC IDs) and DCU information (DCU ID, Channel No. and Extended PAN ID) in memory of Handheld Reader via SLC Reader Application.
   a. Follow path **Master > MAC Address Report** in SLC Reader Application to upload SLCs information in Handheld Reader.
   b. Follow path **Master > Set Parameters > DCU Network Security** in SLC Reader Application to upload DCU information in Handheld Reader.
4. Now Handheld Reader is ready to join RF network, to read data of SLCs and DCUs etc.

How to upload firmware in Handheld Reader by PICkit 3

1. Connect PICkit 3 with PC and Handheld Reader.
2. Open MPLAB IDE Application on PC or laptop and follow path **Configure > Select Device**.
3. Search and select Handheld Reader Device **PIC24FJ64GA004**. Programmers section in Select Device must show PICkit 3.
4. Follow path **Programmer > Select Programmer** to select PICkit 3.
5. Follow path **File > Import** to select and upload firmware into Handheld Reader.



How to reset MAC ID of SLC in memory of DCU

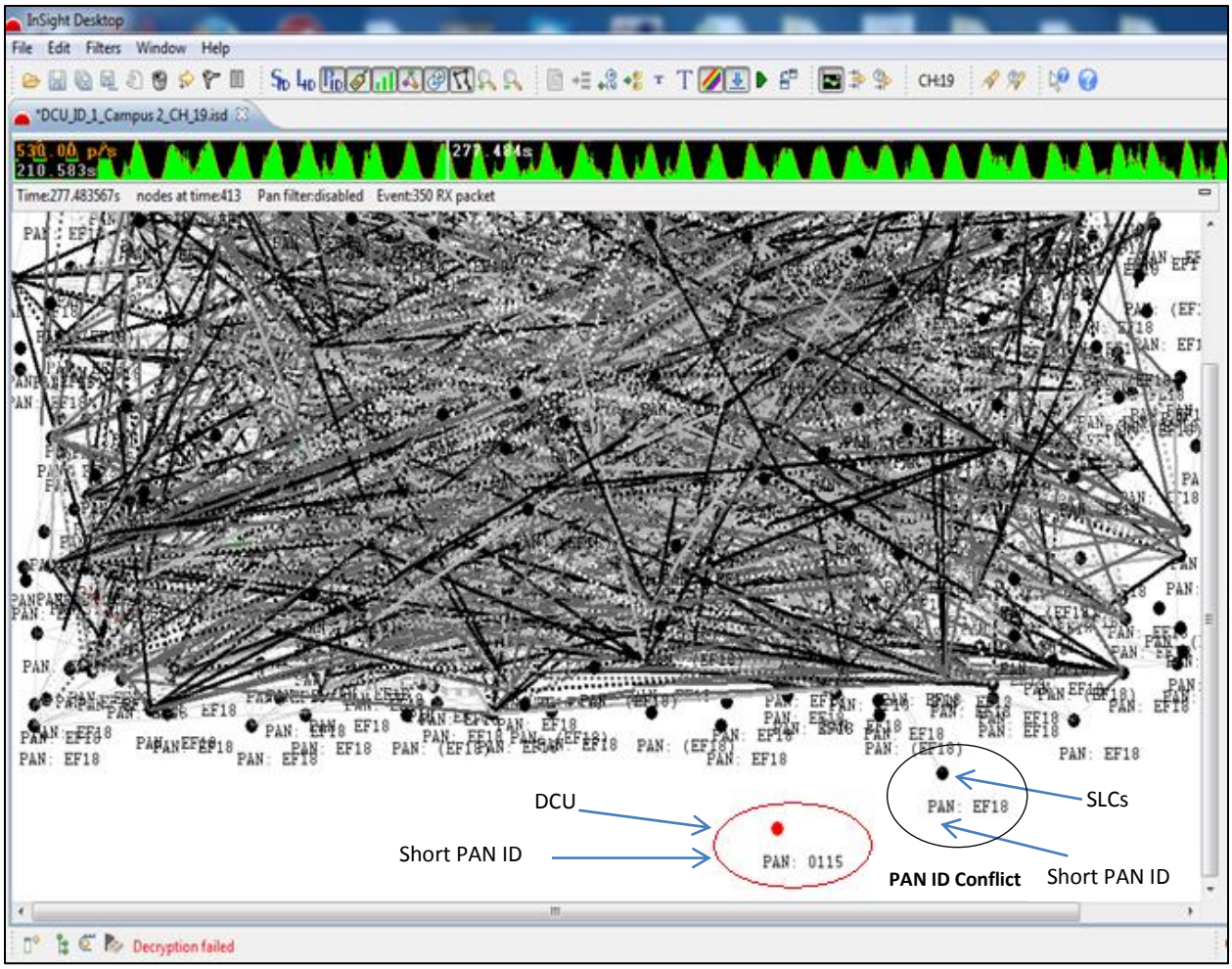
Reset SLC Data command can be used to erase MAC IDs of all SLCs from the memory of DCU. But there is no command which can erase MAC IDs of particular SLCs from the memory of DCU.
If MAC ID of SLC is active in memory of DCU and needed to be reset in DCU so that DCU will not send and receive messages from this particular SLC then send SET MAC command to this SLC again. This will reset the MAC ID of SLC in memory of SLC.

PAN ID Conflict between DCU and its SLCs

If 2 DCUs shared same RF parameters (extended PAN ID, Short PAN ID and Channel no.) and placed at close distance to each other, PAN ID conflict could occur between DCUs and SLCs. If PAN ID conflict occurs then Short PAN ID of SLCs will have different value than Short PAN ID of their DCU. This will cause communication failure between DCU and its SLCs because SLCs left their existing RF network with DCU.

How to resolve PAN ID Conflict issue

1. Use RF sniffer chip along with Ember ISA-3 Adapter and Insight Desktop Application to detect the PAN ID conflict in RF network of DCU and its SLCs.
2. Need to change the PC or Laptop network settings according to Ember Adapter's IP 192.168.1.111.
    a. PC or Laptop IP: 192.168.1.100
    b. Subnet Mask: 255.255.255.0
    c. Gateway IP: 192.168.1.1
3. Once the difference in Short PAN IDs in SLCs and DCU are observed, change the Short PAN ID of DCU with the value of Short PAN ID of SLCs in Gateway Web Console. This will allow SLCs to form RF network with DCU again.



Cause of Communication Failure between DCU and its SLCs

When DCU is not able to communicate with its active SLC, communication failure occurred.
If communication failure is observed between DCU and its SLCs then reason could be any of the following,

1. SLC is not powered ON.
2. Power failure or power supplied to SLC is not consistent.
3. RF of SLC is faulty.
4. PAN ID conflict in RF network.

If power supply is fine and SLC is turned ON, check the RF connectivity of SLCs and DCU through Handheld Reader.

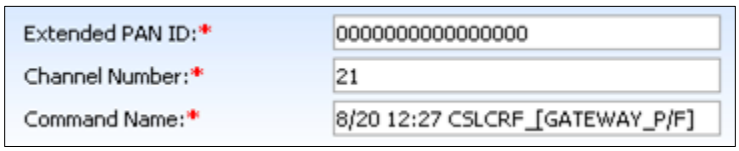
a. If Handheld Reader is able join the RF network and read the data of SLCs and DCU then communication link must be formed between DCU and its SLCs.
b. If Handheld Reader could not detect SLCs/DCU then either RF faulty or PAN ID conflict in RF network between DCU and its SLCs could be the reason of communication failure. Note: Make sure SLCs and DCU information are loaded in Handheld Reader before using reader to detect SLCs and DCU.
c. If Handheld Reader could not detect SLCs/DCU then use RF sniffer chip along with Ember ISA-3 Adapter and Insight Desktop Application to check the RF parameters of DCU and SLCs.

	SLC No.	SLC Name	Date - Time	Address	LS	LC	LCyc	C	B	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	14006	SLC-14006	08/20/2015 07:02:47							0	0	0	0	0	0	0	Manual
	14007	SLC-14007	06/23/2015 10:09:34							0	0	0	0	0	0	0	Manual

How to change channel of SLC in field through LG

Steps to change channel remotely,

1. Power ON SLC.
2. Send unicast read data command to SLC via DCU to check whether SLC is sending current data in LG or not.
3. If SLC is sending current data in LG, change channel of SLC through LG.
4. Now follow the below path in LG Application to change channel of SLC,
   Home > Controls > Get/Set System Parameters > Change SLC RF Parameters
   a. Keep Extended PAN ID field as **0000000000000000** and type channel number in Channel Number field in Change SLC RF Parameters submenu of LG Application.
   b. Change channel of one SLC at a time.
5. If there are more than one SLC then follow step 1 to 4 to change the channel of all other SLCs in same way.
6. Once the channel change is done in all SLCs, change the DCU's scan channel, which should be same as that of channel set in SLCs.
7. Send unicast read data command to all SLCs via DCU to check current data in LG.
8. If current data of SLCs are coming in LG after channel change then channel of those SLCs is set successfully.



SLC GO LIVE Logic

During commissioning mode, SLC is set at production channel no. 11. Handheld Reader can be used to read data of SLC in commissioning mode. Whenever SLC is powered ON, it will go through dimming cycle process in commissioning mode. To stop repetition of dimming cycle, SLC needs to be connected with DCU. To do so, GO LIVE command can be sent from Handheld Reader or IOS device to SLC. Once GO LIVE Command is sent to SLC, it will leave its existing channel 11 to start searching other channel. By this way SLC is entered into free join mode. It will never enter into commissioning mode again.
During free join mode, SLC sends ID frame messages to DCUs. If any DCU is loaded with MAC ID of that SLC, DCU passes its RF parameters (Extended PAN ID, Short PAN ID and Channel) to SLC. This allows SLCs memory to store RF parameters. Thus, RF network is formed between SLC and DCU.

SLC GO LIVE Process using IOS Device

If end to end connectivity is formed between IOS device and SLCs via Bridge,

1. Send read data command to SLC(s) from IOS device to check parameters values of SLC.
2. If read data command is sent successfully and IOS device received desired values of SLC then send GO LIVE command from IOS device to SLC(s). Once GO LIVE command is received by SLC, it leaves channel 11 and tries to connect to other channel, make sure DCU is turned ON and configured with different RF parameters. This will allow SLC to connect with DCU.

SLC GO LIVE using Handheld Reader

In commissioning mode, Handheld Reader can communicate with the SLC on Channel 11 only. After setting the SLC ID and Channel 11 in the SLC reader with the Link to SLC key, the reader can communicate with the SLC even though the SLC is not connected with a DCU. The "GO LIVE" button will put the SLC into free join mode and search for a DCU. Note that if you want to keep the SLC still in commissioning mode then don't press the "GO LIVE" button else it will not be brought back to the commissioning mode.

1. Press the **ALT** key to enable the shift function. Now press the **Go Live** button. Press the **Enter** key then use ← and→ keys to select **YES**. Press the **Enter** key again to execute the command.

COMMISSIONING OVER = YES	COMMISSIONING DONE SEND	COMMAND SENT SUCCESSFULLY	LINK AGAIN TO SLC

2. Now the SLC is commissioned and is in free join mode to join the DCU that has MAC ID of the SLC loaded in its memory. Once it has joined the DCU, it will operate with all the parameters set as commissioned.

How to move SLC sets with RF parameters back into free joining mode

In case already connected SLC with DCU requires to be shifted back to free joining mode, follow below steps,

1. Power ON the SLC(s).
2. OTA the updated hex file in SLC by using Channel Changer Board.
3. Send Read Data command to SLC to make sure SLC is connected with DCU.
4. Verify uploaded hex file in SLC by sending SLC version command to SLC from LG Application.
5. If any parameters (Mode, Latitude, Longitude, DST, Set Fault, RTC Sync etc.) need to be set in SLC then this step can be performed.
6. Erase MAC ID of SLC from the memory of DCU by sending Reset SLC Data command from LG Application. This step can be verified by accessing Gateway Web Console.
7. Change existing channel of DCU to any other channel.
8. Read data of SLC from Handheld Reader and then send GO LIVE command to SLC from reader. This step can be verified by the appearance of "Leave" message in Ember Desktop Application, when RF sniffer channel was set at DCU's new channel.

After performing above steps, SLC will try to join DCU at newly changed channel. As DCU does not contain MAC ID of SLC, it will not be connected with DCU and will try to join another network. This indicates that SLC is shifted back to free joining mode.

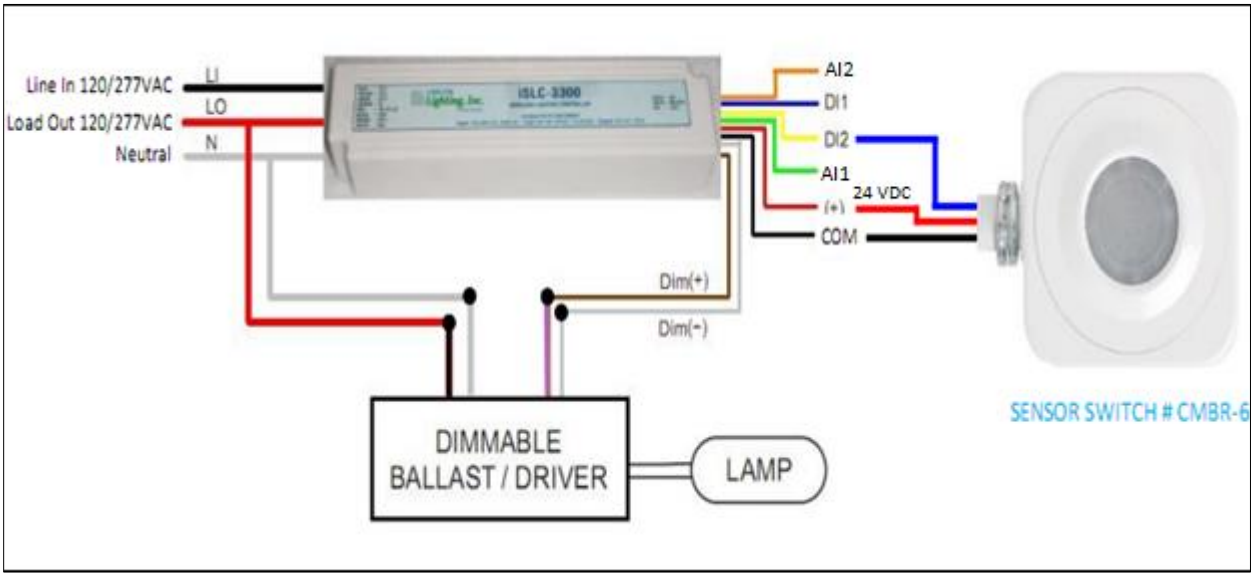
How to set motion sensor based dimming in SLCs through LG Application

Following motion sensors are tested with SLC 3300 and SLC 3100 7P 480V in lab:

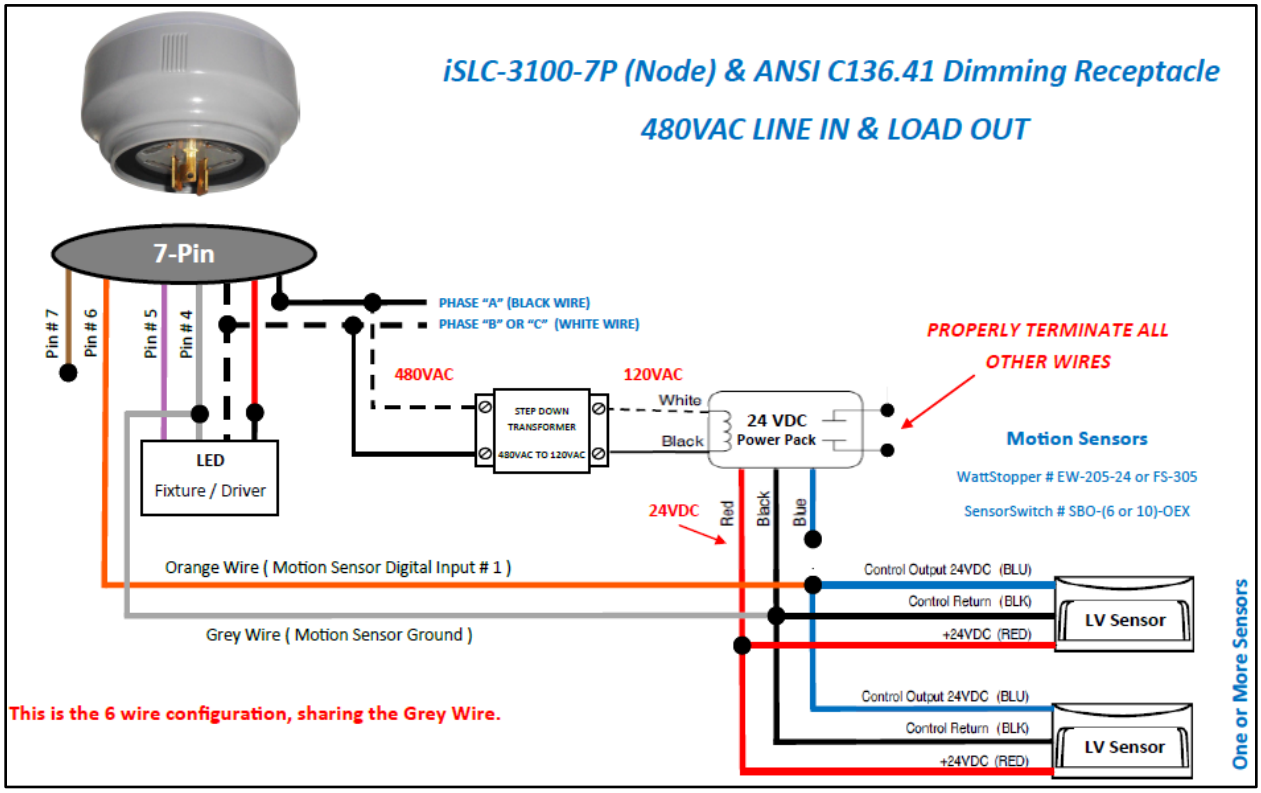
1. FS-305 Watt Stopper with FS-L4W Lens
2. EW-205 Watt Stopper
3. SBO-(6 or 10)-OEX

Make sure wires are connected properly between different hardware products.

Wiring diagram of SLC–3300 with Motion Sensor



Wiring diagram of SLC 3100 7P 480V with Motion Sensor

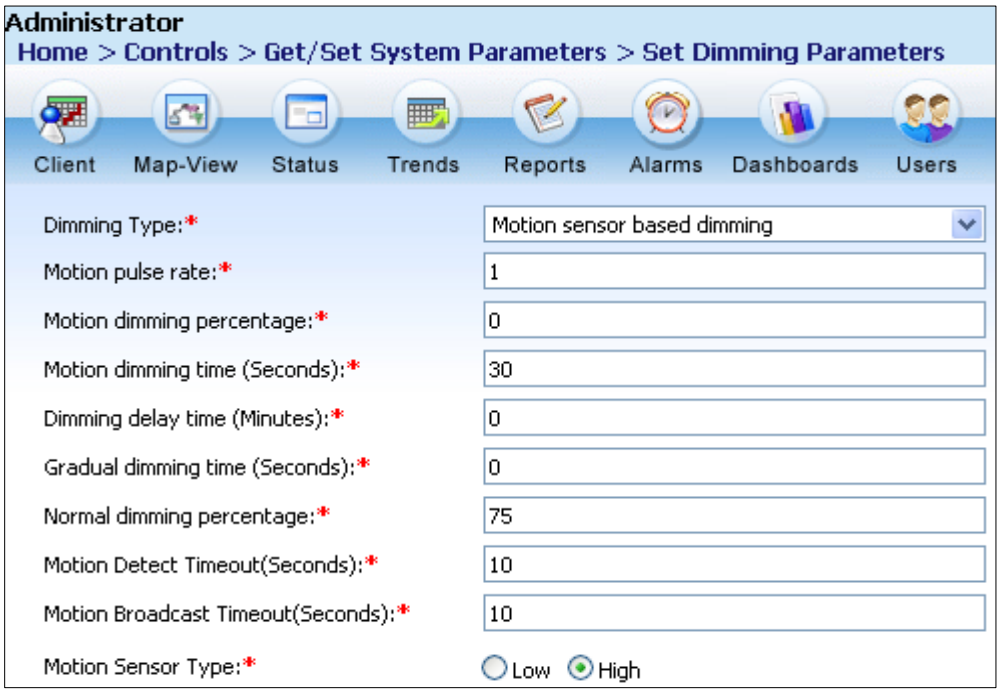


Group of SLCs needs to be created before sending motion sensor based dimming command to DCU via LG. User can create up to 8 different groups and particular SLC(s) can be included in multiple groups based on the client's requirement.

Steps to follow in LG,

1. At first set the SLC(s) in Manual Mode and then send read data command to verify connectivity of SLCs with LG via DCU.
2. Follow path, **Home > Controls > Get/Set System Parameters > Set Dimming Parameters**, in LG.

3. Select Dimming Type as "**Motion sensor based dimming**" and enter parameter values as per client's request. Motion Sensor Type can be selected as Low (0 V DC) or High (24 V DC). It means Low Motion Sensor gets ON at 0 V DC, when motion is detected, and gets OFF at 24 V DC, when no motion is detected. Similarly, High Motion Sensor gets ON at 24 V DC, when motion is detected, and gets OFF at 0 V DC, when no motion is detected.



4. Click on + button on right side of Test DCU to create group of SLC(s) on which motion based dimming will be applicable as shown below,

5. Select Group ID, type Group Name and select SLC(s) to create group. At the max, 8 different groups can be created. Particular SLC(s) can be included in multiple groups depend upon SLCs arrangement in field.

6. Once the group of SLCs is created, send command to DCU from LG.
7. Lamp will turn ON and brightness of lamp will be based on normal dimming percentage.
8. Now perform motion activity in front of Motion Sensor. This will allow Motion Sensor to detect motion and to turn ON lamp as per motion dimming percentage.
9. Cover the Motion Sensor with opaque object so that it cannot detect motion. After adjustable minimum ON time delay, lamp will be turned OFF.

How to set motion sensor based dimming in SLCs through IOS Device

If user wants to control motion based dimming of lamp from IOS device then motion sensor based dimming command must be sent first to SLC via DCU from LG Application.
Steps to follow in IOS device,

1. Open IOS App and select Schedule menu to set ON and OFF schedule times.
2. Select dimming type as "**Motion Based Dimming**", save schedule times and then send command to SLC(s).

End to end connectivity check between IOS Device and SLCs

Whenever communication issue is occurred between IOS device and SLCs via Bridge, first of all make sure,

1. IOS device is connected with Bridge via Bluetooth.
2. SLCs are powered ON.
3. Bridge is connected with SLCs via RF network.
    a. If "NWK" LED is blinking on the face of Bridge then it indicates RF network is formed between Bridge and SLCs. It means Bridge is connected with SLC(s).
    b. If "NWK" LED is ON continuously then it indicates Bridge is not able to detect RF network and thus not connected with SLCs.
4. If end to end connectivity is fine but still read data command is not sent to SLC from IOS device, make sure generated token contains correct SLC ID numbers and MAC Addresses.
5. If SLC ID and MAC Addresses are correctly entered in Token and end to end communication link looks fine then check the RF parameters of SLC through RF Sniffer and/or Handheld Reader.

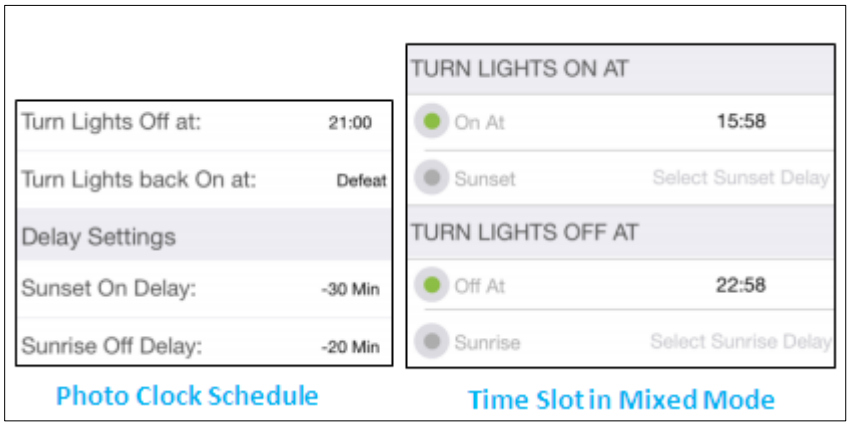
How to set Astro Mode in SLC via IOS Device

SLC Connect IOS Application has three modes,

1. Manual Mode
2. Photocell Mode
3. Mixed Mode

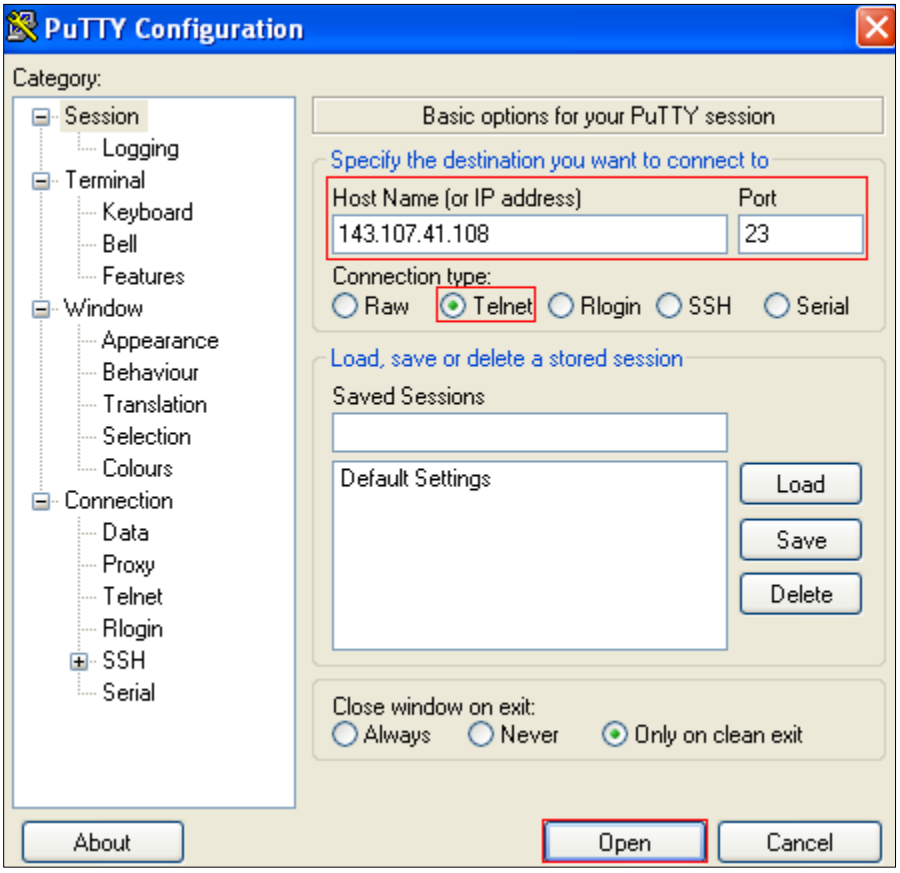
There is no separate Astro Mode option available in SLC Connect IOS Application. But there are two methods to set Astro Mode in SLC from SLC Connect IOS Application.

1. **Photo Clock Schedule** option can be used to set Astro Mode in SLC. This can be done by setting Lights ON and OFF as "Defeat" and setting Sunrise and Sunset times as per client's preference.
2. Astro Mode can be set in SLC through **Mixed Mode** from IOS App.



How to access DCU via Telnet

When Ethernet or GPRS connectivity is fine with DCU but still user is not able to login into Gateway Web Console page of DCU, Telnet can be used to access DCU for troubleshooting and controlling. In order to access DCU via Telnet, PUTTY exe must be installed at Server where Control Interface Windows Service is installed.



Login details to access DCU via Telnet,
Login: **root**
Password: **cimcon!00**

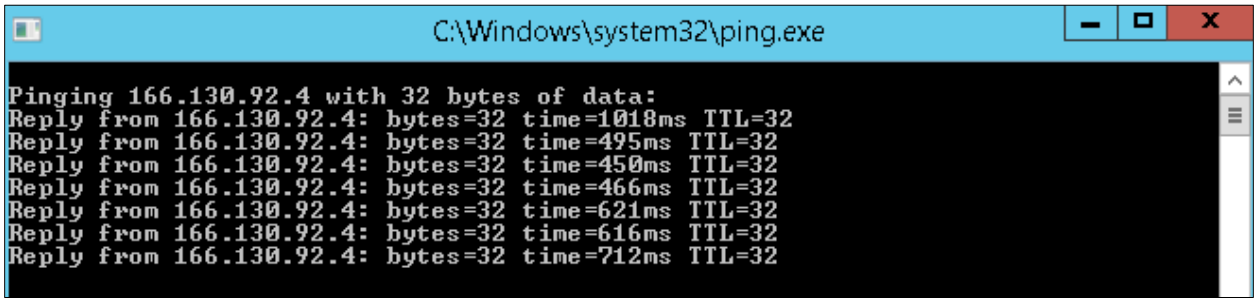
Following Linux commands can be used to verify files loaded in DCU and to troubleshoot and control DCU,

1. **cd /home/eclipse/linux_dcu**: After this command, enter and type command **cat web_para.txt**. This command allows user to see DCU details like RF parameters, Live IP, port, number of active SLCs etc.
2. **cd /home/eclipse/linux_dcu**: After this command, enter and type command **ls.** This command allows user to see files like web_para.txt, DCU exe version etc.
3. **cd /etc/init.d:** After this command, enter and type command **ls.** This command allows user to see files like dcu_script etc.
4. **vi <file_name>:** This command allows user to read and write content inside the files. For example: **vi dcu_script** allows user to see content inside the dcu_script file. If user wants to exit from file's content then type **shift+q**, enter and type **q!**. If user wants to exit but want to safe the file's content then type **w+q** and enter.
5. **cd /etc/ppp/peers**: After this command, enter and type command **ls.** This command allows user to see pppprovider and provider files. Those files are necessary for DCU to communicate with Control Interface window service through GPRS. Then, enter and type command **cat pppprovider**. This command allows user to see details inside pppprovider file.
6. **cd /etc/chatscripts**: After this command, enter and type command **ls.** This command allows user to see chatprovider and other required files in chatscripts. Then, enter and type command **cat chatprovider**. This command allows user to see details inside chatprovider file.
7. **ps –aux**: This command allows user to check and verify exe file loaded in DCU.
8. **df –h**: This command allows user to check the space availability in DCU's memory. **rm /var/cache/apt/archives/*.deb** and **rm /var/lib/apt/lists/*ftp*** commands allow user to remove unwanted data in DCU's memory.
9. **nandctl ––stats**: This command allows user to get information related to bad sectors in DCU's memory.
10. **uname**: This command allows user to check the name of the Kernel. User can also use **uname –r** and **uname –a** to know the version of the Kernel.
11. **reboot**: This command allows user to restart DCU.

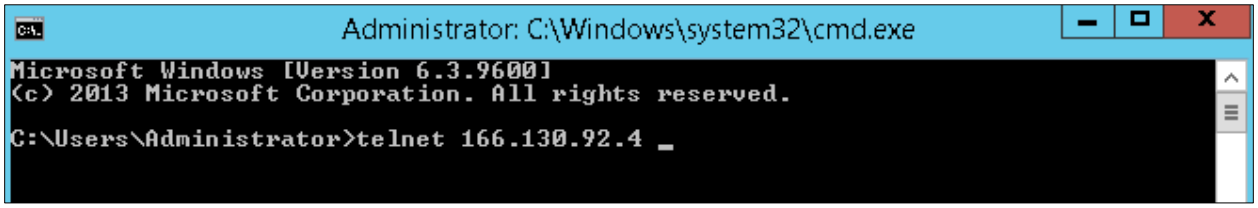
How to check connectivity link between two end nodes

The following three methods are used to check connectivity link between two end nodes,

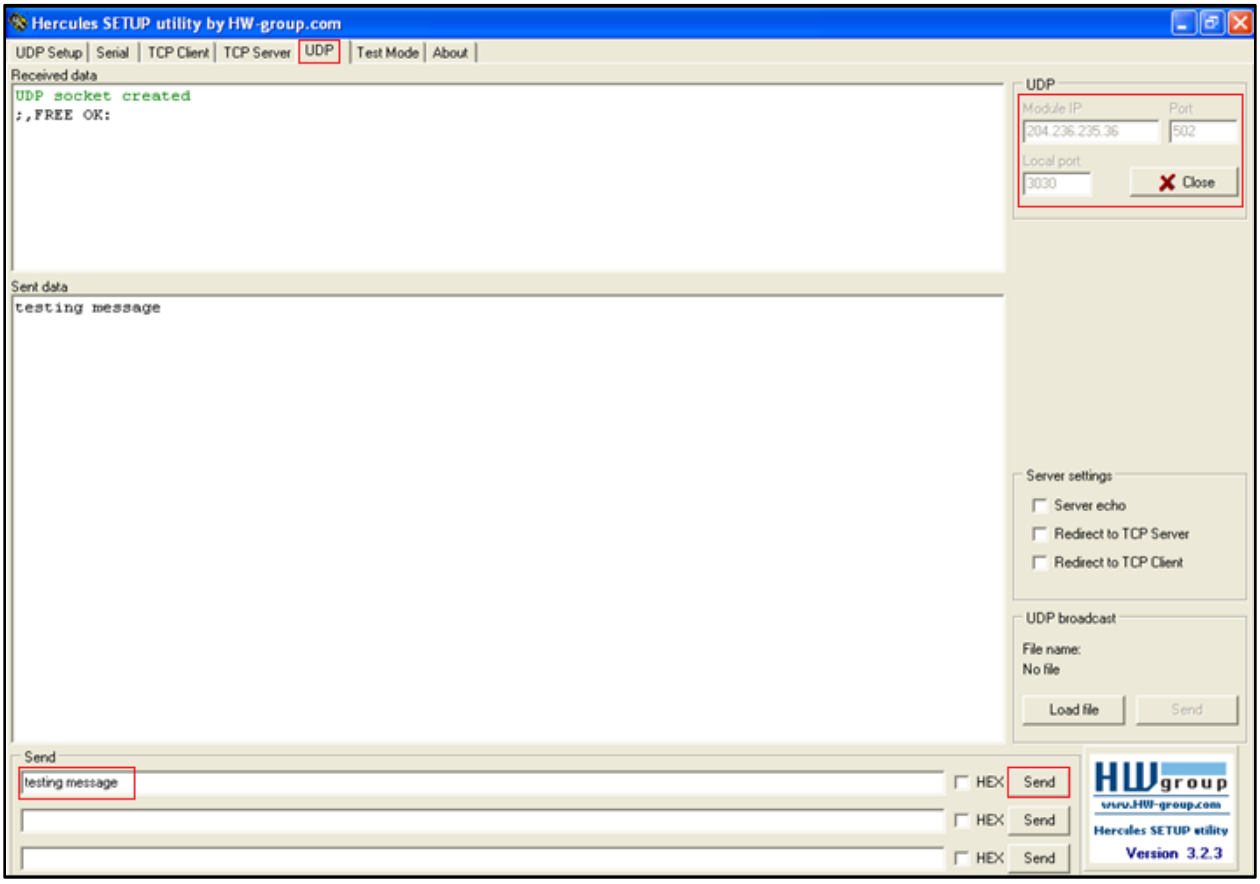
1. **Ping**: Ping the IP address of Server where LG (CMS) application is installed from local machine where LG instance will be used and vice-versa. User can also ping static IP address of DCU to check Ethernet or GPRS connectivity.



2. **Telnet**: If communication ports on Server and local machine are based on TCP/IP then telnet IP address along with port number of Server from local machine. If user wants to telnet DCU then PUTTY exe must be installed at Server machine where C.I is installed. PUTTY can be used to telnet DCU.



3. **Hercules Utility**: Telnet works for TCP/IP ports but not for UDP ports as later protocol does not support handshake technique. Therefore, to check the flow of data package between CMS server and client's machine, Hercules utility is required.



Partial GPRS AMR log file of Control Interface

```
9/2/2015 8:29:55 AM,    Data received: ;5,5,FREE,AMR:, Length: 14, IP:166.130.5.98, Port:3030
9/2/2015 8:29:56 AM,    Data received: ;3,3,FREE,AMR:, Length: 14, IP:166.130.149.75, Port:3030
9/2/2015 8:30:00 AM,    Data received: testing message, Length: 15, IP:203.88.129.81, Port:3444
9/2/2015 8:30:00 AM,    Corrupted Data received: testing message, Length: 15, IP:203.88.129.81, Port:3444
9/2/2015 8:30:01 AM,    Data received: ;7,8,DCUTime=02/09/2015 08:30:01,0,-5.00,AMR:, Length: 45, IP:50.198.115.153, Port:30
9/2/2015 8:30:01 AM,    Date Difference Actual from DCU: 02/09/2015 08:30:01
```

Database used by LG Application and Control Interface Windows Service

Database, MS SQL 2008 R2, acts as a bridge between LG Application and Control Interface Service. Control Interface interacts with MS SQL 2008 R2 to get command messages initiated by user through LG Application and then send command messages further to DCU. Incoming acknowledgement and other messages from DCU/SLCs are stored in MS SQL 2008 R2 through Control Interface. These messages are parsed and then displayed in front end of LG Application. This way LG Application and Control Interface Windows Service interact with database, MS SQL 2008 R2, to display meaningful information received from DCU/SLCs at front end of LG application for user.

Following are some of the useful tables in MS SQL 2008 R2,

1. **OUTGOINGSMS Table**: When any command message is sent from LG Application, SENDSTATUS column of OUTGOINGSMS Table displays value 1. When DCU receives command message and then send Acknowledgement message to CI, SENDSTATUS column of OUTGOINGSMS table is updated with value 2.

	outsmsid	outgoingsms	sendstatus	createdon	commandtype	rtunumber	clientid	readerid
1	3904	;1R,8525;	1	2015-05-12 15:51:15.520	R	-1	4	4
2	3903	;1R,102483078308883098310831183128313831...	2	2015-05-12 14:51:42.547	R	-1	4	4
3	3902	;1RFD,102483078308883098310831183128313831...	2	2015-05-08 19:00:31.787	R	-1	4	4

	outsmsid	outgoingsms	sendstatus	createdon	commandtype	rtunumber	clientid	readerid
1	3904	;1R,8525;	2	2015-05-12 15:51:23.597	R	-1	4	4
2	3903	;1R,102483078308883098310831183128313831...	2	2015-05-12 14:51:42.547	R	-1	4	4
3	3902	;1RFD,102483078308883098310831183128313831...	2	2015-05-08 19:00:31.787	R	-1	4	4

2. **TEMPINCOMINGSMS Table**: CI sends data string of Acknowledgement message(s) received from DCU to TEMPINCOMINGSMS Table and WRITESTATUS column displays value 1. When LG Application reads data string of Acknowledgement message(s) present in TEMPINCOMINGSMS Table, the WRITESTATUS column is updated with value 2 and then data in TEMPINCOMINGSMS will be cleared after sometime.

	MOBILENUMBER	INCOMINGSMS	WRITESTATUS	CLIENTID	RTUNUMBER	CommingDate	TID
1	0	;1R,1,3904;	1	4	4	2015-05-12 15:51:21.587	4401
2	0	;3R,8525,3904;	1	4	4	2015-05-12 15:51:23.593	4402

	MOBILENUMBER	INCOMINGSMS	WRITESTATUS	CLIENTID	RTUNUMBER	CommingDate	TID
1	0	;1R,1,3904;	2	4	4	2015-05-12 15:51:21.587	4401
2	0	;3R,8525,3904;	2	4	4	2015-05-12 15:51:23.593	4402

3. **ACKNOWLEDGESMS Table**: When WRITESTATUS column is updated with value 2 in TEMPINCOMINGSMS Table, it means data string of Acknowledgement message is transferred to ACKNOWLEDGESMS Table. When User selects unacknowledged command in **Track Network**

Commands menu in LG Application, WRITESTATUS column will be updated with value 2 in ACKNOWLEDGESMS Table.

	incomingsms	clientid	rtunumber	writestatus	outsmsid	receivedon
1	;1R,1,3904:	4	4	1	3904	2015-05-12 15:52:11.513
2	;1R,1,3903:	4	4	1	3903	2015-05-12 14:51:05.150

4. **DIGITALDATA<*clientID*> Table**: All 19 Status Parameters and their values (0 or 1) captured from SLCs are stored in DIGITALDATA<*clientID*> Table. Archive records of these Status Parameters of SLCs are stored in **ARCHIVE_DIGITALDATA<*clientID*>** Table.

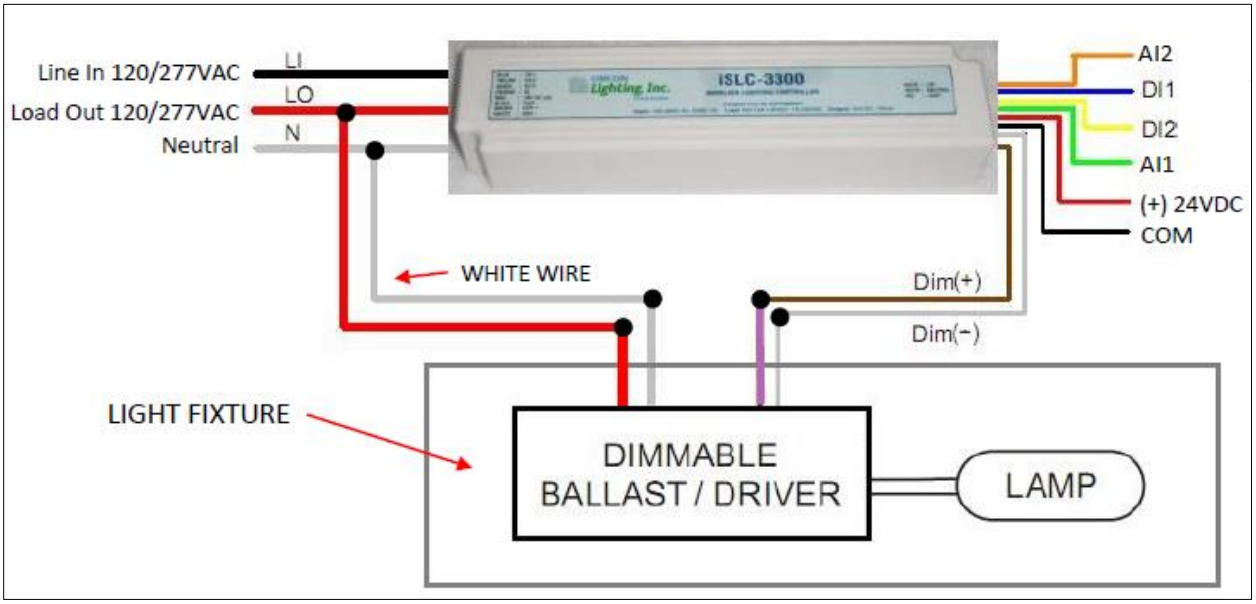
5. **ANALOGDATA<*clientID*> Table**: All 11 Power Parameters and their values captured from SLCs are stored in ANALOGDATA<*clientID*> Table. Archive records of these Power Parameters of SLCs are stored in **ARCHIVE_ANALOGDATA<*clientID*>** Table.

How to troubleshoot when lamp is not getting ON in field but LG displays lamp ON

When lamp is not getting ON in the field but LG is displaying lamp ON in Status menu, check the power supply and wiring connection between SLC and lamp fixture.

	SLC No.	SLC Name	Date - Time	Address	LS	LC	LCyc	C	B	R	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	LSW	Mode	Temperature
	39	SLC-39	12/22/2015 04:36:38	Boston, MA	●	●	●	●	●	●	247.58	0.07	0	0.08	88.42	58	0.02	2.39	Astro Clock	12

Wiring connection between SLC 3300 and lamp fixture



2 hot (Split Phase) could be supported by SLC and most of the Drivers.
If wiring connection seems fine then measure the voltage at following points:

1. Input voltage to SLC from power supply.
2. Input voltage to Driver from SLC's output.
3. Dimming voltage going into Driver from SLC.
4. Output voltage from Driver to LED lamp.

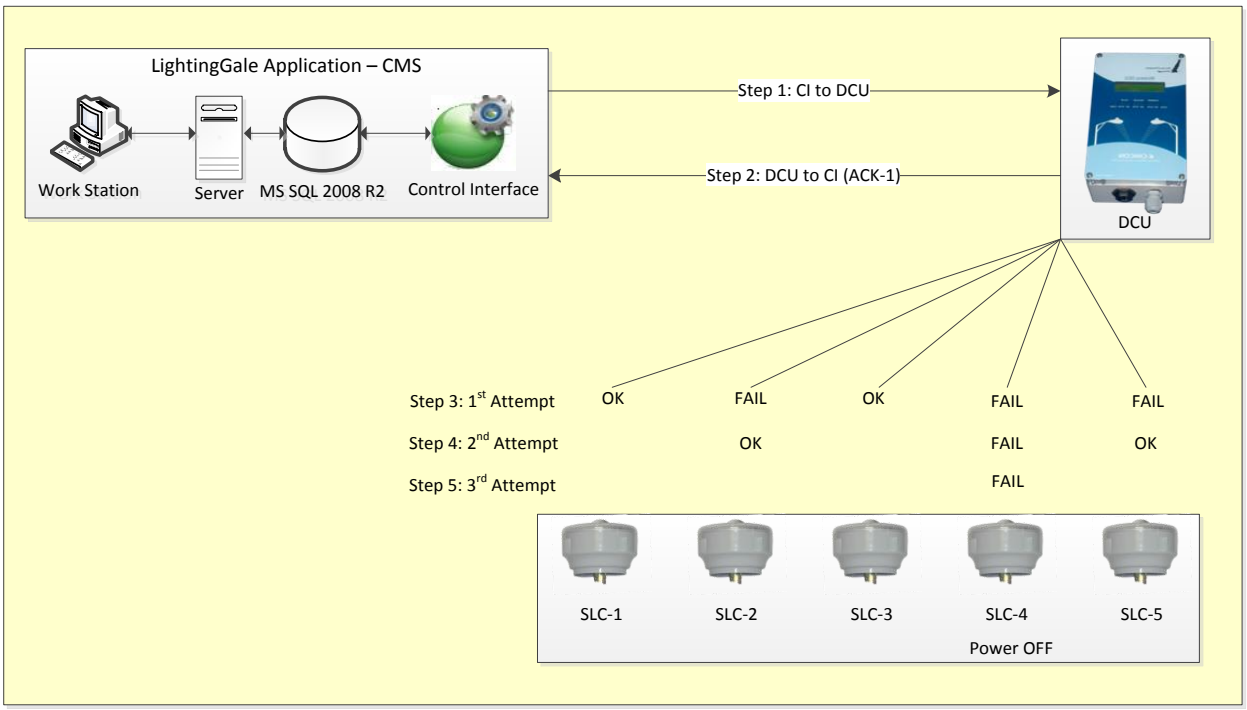
If voltage at any of the above mentioned points is not showing expected value then there could be any of the following issues:

1. Power supply issue
2. Light fixture design issue
3. Hardware issue

Comparison between DCU V.5 and DCU V.7

In DCU V.7, there are no changes in logic of Gateway Commands and Broadcast of Set Command to SLC. New logic is applicable for SLC commands only. If all SLCs acknowledge in 1st retry then there is no need to wait for 2nd and 3rd retries. For example, data string, ;19,18,3GQ,1|2|3|4|5,3648,AMR: , is sent to CI from DCU when all selected SLCs received response from DCU in 1st retry. SLCs data messages will also be sent to CI from DCU.

1. **Comparison based on Formats of Send and Receive Command Messages**
   In DCU V.5.0.17 and earlier, when multicast command is used to send multiple messages to DCU via CI, DCU receives data string of each sent command message individually and sends acknowledgment message of each received message individually to CI. Whereas, in DCU V.7, when multicast command is used to send multiple messages to DCU via CI, DCU receives all sent messages in single data string in which SLC numbers are separated with each other by pipes and sends only one acknowledgment message to CI.
2. **Comparison based on Acknowledgement messages received by CI**
   In DCU V.5.0.17 and earlier, CI receives acknowledgement message when DCU received the sent command message. Whereas, in DCU V.7, CI receives first acknowledgement message when DCU received the sent command message and receives second acknowledgement message when DCU received response from SLCs.
3. **Comparison based on DCU to SLC communication**
   In DCU V.7, DCU sends message further to SLCs and receives response from SCLs either in 1st retry or in 2nd retry or in 3rd retry. This functionality is comprised in all Set, Get and Read commands. Whereas, in DCU V.5, this functionality is available only in Read commands.
4. **Comparison based on Total Turnaround Time**
   Turnaround Time: Total time taken between the submission of command message for execution at SLC(s) and the return of complete output of command message to LG (with CI) is referred as Turnaround Time.
   Turnaround Time taken by DCU V.7 is lower than Turnaround Time taken by DCU V.5 and earlier versions.



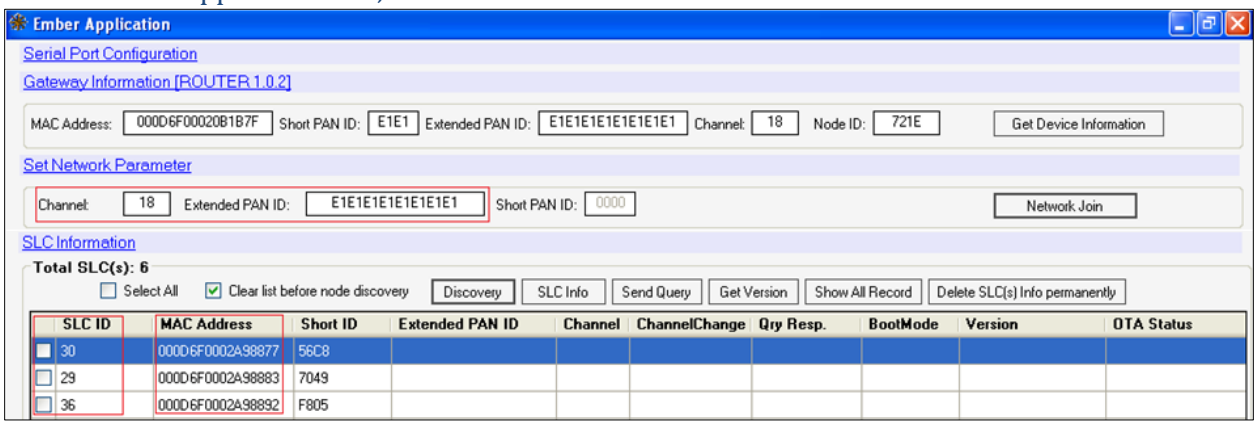
How to identify MAC ID of SLC

When MAC ID of SLC is unknown, the following methods will be useful to find MAC ID of SLC:

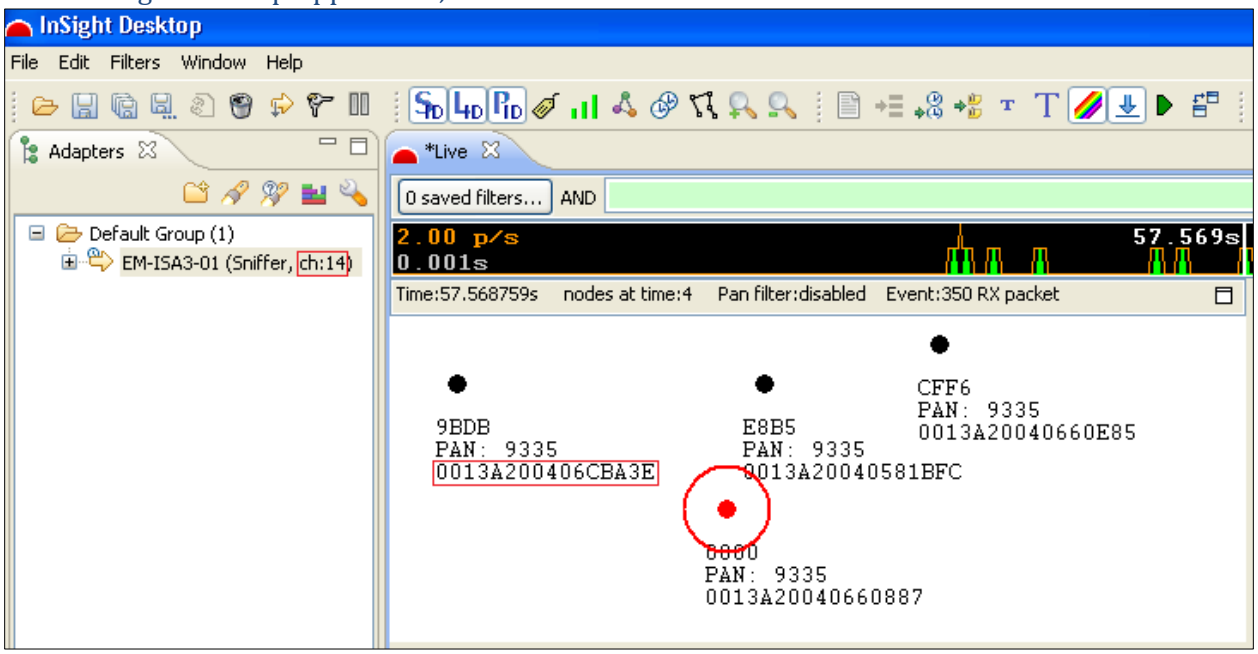
1. If SLC is in free joining mode then power ON the Test-DCU and SLC on test bench and check the orphan file of DCU in web console page to get the MAC ID of SLC.
   Partial Orphan File in web console page of a DCU,

```
SLC_ID = 2484,DATE = 18-01-16 11:00:00,SLC_MAC = 000D6F0005474D25, STATUS = ORPHAN
SLC_ID = 2566,DATE = 18-01-16 11:00:00,SLC_MAC = 000D6F000A8C92F0, STATUS = ORPHAN
SLC_ID = 2673,DATE = 18-01-16 11:00:00,SLC_MAC = 000D6F00054757B3, STATUS = ORPHAN
SLC_ID = 2698,DATE = 18-01-16 11:05:28,SLC_MAC = 000D6F0005474FEE, STATUS = ACTIVE
```

2. If SLC is joined with any DCU in the past and the channel is known then power ON the SLC and set OTA board at that particular channel to find the MAC ID of SLC in Ember Application Exe.
   Partial Ember Application Exe,



3. If mode status (Commissioning mode (Channel – 11), Free-joining mode or joined) of SLC is unknown then connect RF Sniffer Chip with ISA3 Ember Debug Adaptor and set Insight Desktop Application on each channel (11 to 25) to find the MAC ID of SLC. The MAC ID of SLC along with extended and short PAN IDs will be displayed in Insight Desktop Application at particular channel on which SLC is joined.
   Partial Insight Desktop Application,



RTC Sync Logic Followed By LG, DCU and SLCs

1. If there is a difference of 10 minutes between RTC of DCU and LG Server Time then LG sends RTC sync to DCU automatically and DCU broadcasts the same to its SLCs.
2. If there is a difference of 10 minutes between RTC of few SLCs and RTC of DCU then DCU broadcasts the RTC sync message to its SLCs at the end of log rate.
3. If there is a difference of time between majority of SLCs time and RTC of DCU then DCU concludes that its own RTC got damaged and it tries to sync its own time from the SLCs time. The reason to develop this logic in exe of DCU is, if DCU lost communication with LG system and DCU's RTC got corrupted then DCU would affect its SLCs time. Thus, when RTC of DCU got damaged, DCU sets its own time from the SLCs time.
4. If GPS modem is inbuilt in DCU then DCU sets its own time from GPS.

Types of RF Polling performed By DCU

There are three types of RF polling performed by DCU.

- Normal Polling
- Astro Polling
- Event Polling

Normal Polling: DCU broadcasts the message to its active SLCs and receives the data from its active SLCs based on the Log Rate value set in DCU. Then DCU sends the data of its active SLCs to Status Menu of LG Application through Ethernet or GPRS GSM or GPRS CDMA.
For example, if Log rate value set in DCU is 1 hour then DCU broadcasts the message to its active SLCs after every 1 hour.
Log Rate value in DCU can be set through Web Console. It is beneficial to set the Log Rate value in DCU at 3 or 4 hour, when more than 100 SLCs are controlled by DCU. By doing this,

- The data processing load on DCU will be decreased.
- The SIM Card/CDMA data will be saved, when mode of communication between LG Application and DCU is GPRS GSM/CDMA.
- The LG database will not be overloaded and performance of LG Application will be more effective.

Astro Polling: DCU broadcasts the message to its active SLCs and receives the data from its active SLCs based on the Latitude, Longitude and time zone values set in the SLCs. Astro Polling in DCU occurs at the time of Sunset and Sunrise. It means Astro polling in DCU occurs twice in a day. DCU will not perform the Normal Polling at the time of Astro Polling.
For example, if Sunset and Sunrise times are 6:30 PM and 6:00 AM respectively and Astro Polling is performed by DCU at those times, Normal Polling will not be performed by DCU from 6:00 PM to 7:00 PM and from 5:00 AM to 7:00 AM in a day.

Event Polling: DCU broadcasts the message to its active SLCs just after the Astro Polling finishes. Similar to Astor Polling, Event Polling in DCU also occurs twice in a day. Data collected by Event Polling is useful for diagnostic purposes.
For example, if some SLCs in a group observe abnormal behavior for few minutes after the end of Normal Polling then the unexpected results will be stored in the memory of SLCs temporarily and when Event Polling is performed by DCU, the SLCs send the unexpected results data to DCU.

Overview of Status and Power Parameters in SLC

Parameter	Channel	Description
Status	Abnormal Lamp Condition	When Astro polling starts then at that time DCU checks the lamp status. If it is not according to the Astro condition then this trip is generated by SLC.
Status	Ballast	When the LED driver or Ballast of the HID lamp fails,

		Ballast trip is generated by SLC.
Status	Communication	If SLC is active in DCU's memory but it is not communicating then LG displays Communication failure.
Status	Day Burning	When Lamp is ON even after the inbuilt photo sensor detects daylight, Day Burning trip is generated by SLC.
Status	Dimming Short	This is not exists anymore. When dimming output of the SLC is short due to any reason, this trip was generated.
Status	EM Fault	When inbuilt Energy Metering chip fails in SLC, EM Fault trip is generated by SLC.
Status	Event Over Flow	When 40 events get generated within 1 hour in SLC, Event Over Flow trip is generated by SLC.
Status	Lamp	When Lamp fails, Lamp trip is generated by SLC.
Status	Lamp Cyclic	This is applicable for HID lamps like Sodium vapor which has the phenomenon of flickering or cycling when they are nearing life.
Status	Lamp Status	This is to indicate whether Lamp is ON or OFF.
Status	Photocell Fault	When inbuilt photo sensor stops working, Photocell Fault trip is generated by SLC.
Status	Photocell Oscillating	When inbuilt photo sensor in SLC starts toggling frequently and toggle counter is more than 10 within 18 hour, photocell oscillating trip is generated by SLC.
Status	Photocell Status	This is to indicate the status, Normal or Faulty, of inbuilt Photo sensor in SLC.
Status	RTC Status	When inbuilt clock in SLC stops responding, RTC trip is generated by SLC.
Status	Relay Wield	When relay inside the SLC has shorted and stopped switching, Relay Wield trip is generated by SLC.
Status	Voltage Under Over	When voltage measured by the SLC is beyond its high limit or low limit, Voltage Under Over trip is generated by SLC.
Power	Burn Hours	This is the cumulative ON time of the Lamp measured by SLC.
Power	Cumulative KWH	This is the total power consumption of the Lamp and Driver since the SLC was installed.
Power	Current	This is the current flowing in the circuit of LED fixture measured by SLC.
Power	Dimming	This is the percentage command given by LG to increase or decrease the brightness of light.
Power	Kilowatt	This is the energy consumption of lamp in wattage measured by SLC.
Power	Lamp Steady Current	This is the current measured by SLC when the LED or HID lamp gets stable after it turns ON.
Power	Mode	This is the mode under which the SLC is operating like Schedule, Astro, Manual, Photocell etc.
Power	Power Factor	This is the power factor measured by SLC.
Power	Temperature	This is the temperature of SLC measured by inbuilt Energy Metering chip.
Power	Voltage	This is the line voltage measured by SLC.

SLC Mode recognized by LG Application

LG displays the SLC mode along with other parameters in Status menu.

	SLC No.	SLC Name	Date - Time	Address	LS	LCyc	C	Tilt	DayBurn	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	102	Pole-7507	06/09/2016 07:00:52	Boston, MA						246.96	0	0	118.14	1956.35	100	1	Astro Clock
	182	Pole-7479	06/09/2016 07:00:48	Boston, MA						216.01	0	0	129.17	2030.18	100	1	Astro Clock

There are 8 SLC modes recognize by LG. Below table explains the Mode set in SLC and Mode recognizes by LG,

Mode set in SLC	Mode recognized by LG
0	Manual Mode
1	Photocell Mode
2	Schedule Mode
3	Astro Mode
4	Astro Clock with Photocell Override Mode
5	Civil Twilight Mode
6	Civil Twilight with Photocell Override Mode
7	Mixed Mode
8	Fail Safe Mode

When SLC observed Photocell fault, it set the **"Astro Clock with Photocell Override"** mode in its memory. Under Astro Clock with Photocell Override mode, user cannot set any other mode in SLC unless the memory of SLC is erased by sending the **"Reset SLC Trip"** command from LG.

	SLC No.	SLC Name	Date - Time	Address	LS	LCyc	C	Tilt	DayBurn	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	2046	Pole ID - 50039	06/09/2016 05:12:56	448-474 Revere Beach Blvd, Revere, MA 02151, USA						119.78	0	0	18.27	331.51	100	1	Photocell
	2048	Pole ID - 50040	06/09/2016 05:12:57	448-474 Revere Beach Blvd, Revere, MA 02151, USA						118.47	0	0	114.34	2160.27	100	1	Astro Clock with Photocell Override

When SLC observed both RTC and Photocell faults, it set the **"Fail Safe Mode"** in its memory. Under Fail Safe mode, SLC allows LED to remain ON in day time also. Thus, SLC experiences the Day Burning Trip and sends the message to LG.

	SLC No.	SLC Name	Date - Time	Address	LS	LCyc	C	Tilt	DayBurn	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	2726	pole - 6711	03/25/2016 07:59:49	1076-1180 Winthrop Pkwy, Revere, MA, USA						121.04	0	0	223.1	1460.24	100	1	Photocell
	2729	pole - 6712	03/25/2016 08:08:29	1076-1180 Winthrop Pkwy, Revere, MA, USA						119.78	1.25	0.15	0.02	0.01	0	1	Fail Safe Mode
	2732	pole - 6715	03/25/2016 08:00:25	1048-1074 Winthrop Pkwy, Revere, MA 02151, USA						121.03	0	0	227.14	1384.08	100	1	Photocell

How to change mode of SLC when it is set on "Astro Clock with Photocell Override" mode

1. Follow the path **Home > Controls > SLC Actions > Reset SLC Trip** in LG and select the SLC that is observing "Astro Clock with Photocell Override" in Status menu. Send the Reset SLC Trip command to that SLC.
2. Follow the path **Home > Controls > Configure SLC > Set Mode Configuration** in LG to set the "Photocell" Mode in that SLC again.
3. Follow the path **Home > Controls > Get SLC Configurations > Get Mode** in LG to verify the mode set in the SLC.
4. Follow the path **Home > Controls > SLC Actions > Read Data** in LG to send the read data command to the SLC to check the latest data along with Mode in Status Menu.
5. Follow the path **Home > Status** in LG to check the SLCs data sent to LG via DCU.

Before

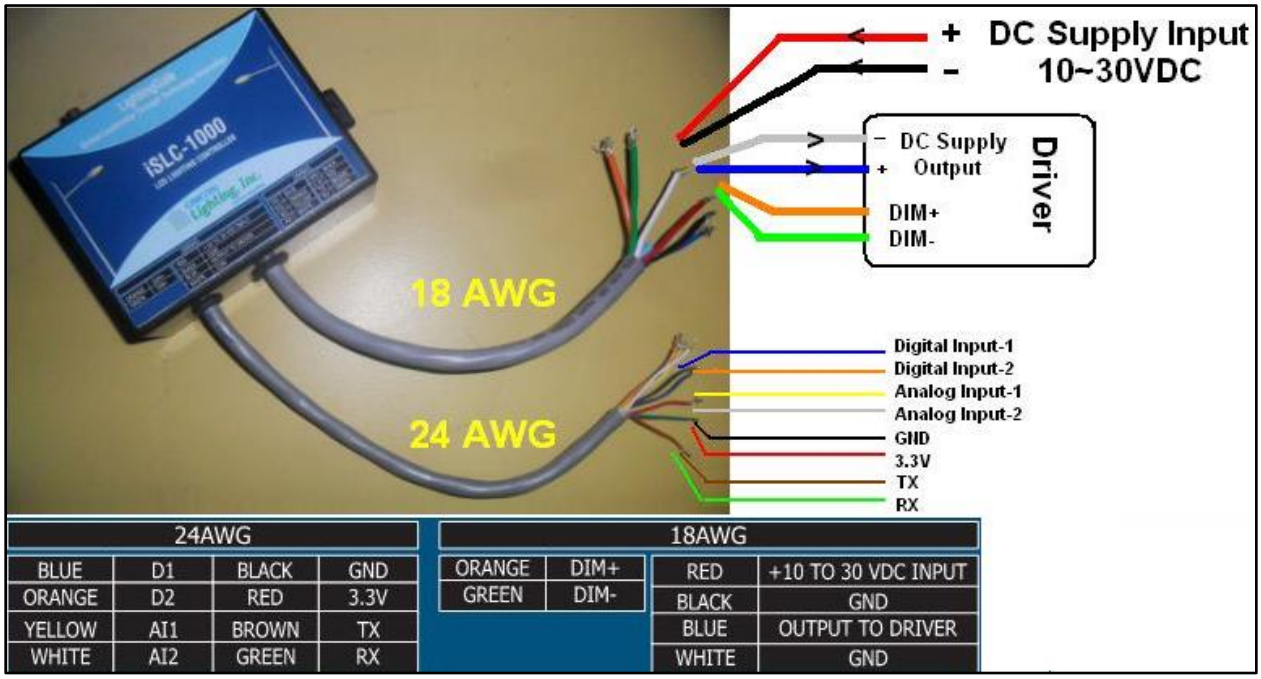
	SLC No.	SLC Name	Date - Time	Address	LS	LCyc	C	Tilt	DayBurn	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	2048	Pole ID - 50040	06/09/2016 05:12:57	448-474 Revere Beach Blvd, Revere, MA 02151, USA						118.47	0	0	114.34	2160.27	100	1	Astro Clock with Photocell Override

After

	SLC No.	SLC Name	Date - Time	Address	LS	LCyc	C	Tilt	DayBurn	Volt	Cur	KW	Cum_Kwh	BHrs	Dim	PF	Mode
	2048	Pole ID - 50040	06/09/2016 05:13:32	448-474 Revere Beach Blvd, Revere, MA 02151, USA						119.97	0	0	114.34	2160.27	100	1	Photocell

Wiring Diagrams of Different Types of SLCs

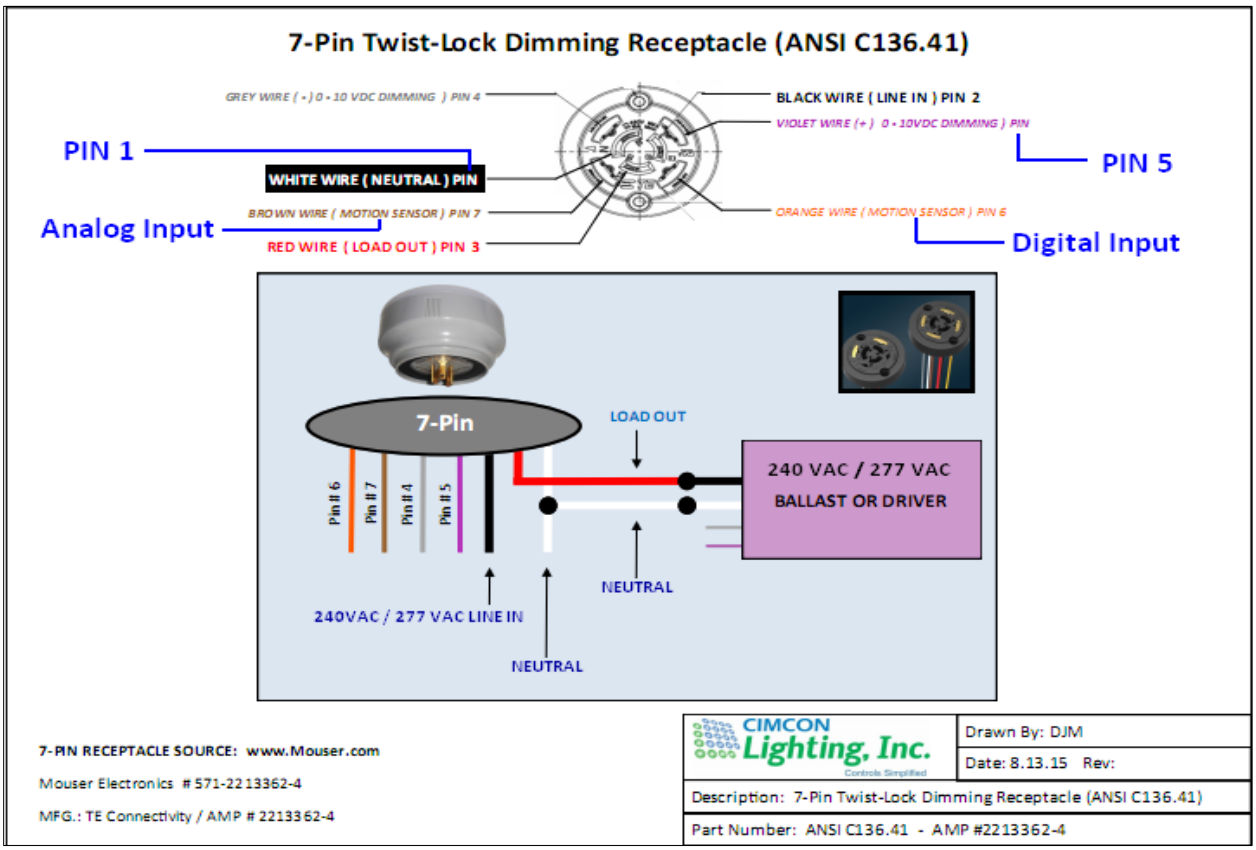
iSLC 1000 Wiring Diagram



24AWG			
BLUE	D1	BLACK	GND
ORANGE	D2	RED	3.3V
YELLOW	AI1	BROWN	TX
WHITE	AI2	GREEN	RX

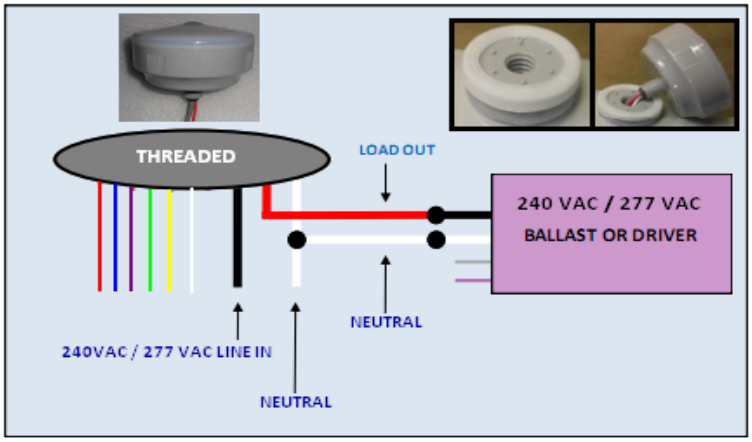
18AWG			
ORANGE	DIM+	RED	+10 TO 30 VDC INPUT
GREEN	DIM-	BLACK	GND
		BLUE	OUTPUT TO DRIVER
		WHITE	GND

iSLC 3100 7P 240/277 VAC Wiring Diagram



iSLC 3100 TN 240/277 VAC Wiring Diagram

Threaded Receptacle



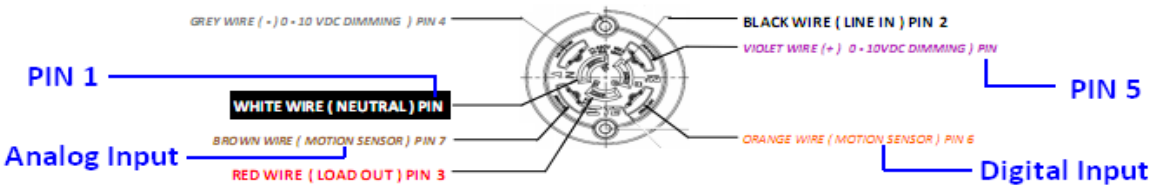
Wire color	Feature
RED	AI
BLUE	DI-1
VIOLET	DI-2
GREEN	GND
YELLOW	DIM+
WHITE	DIM- / GND

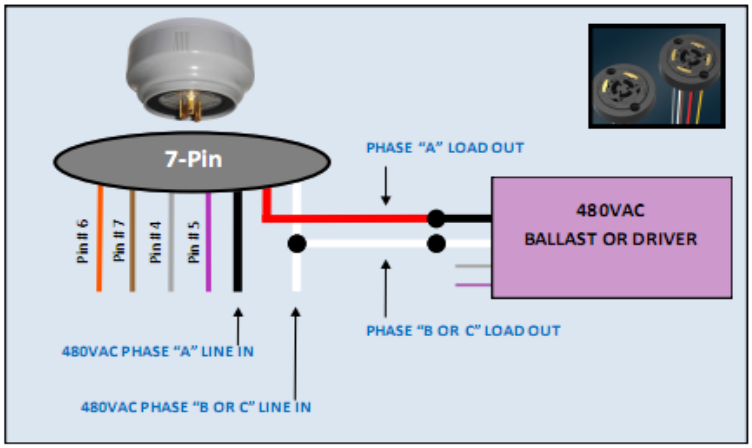
BLACK WIRE (LINE IN) PIN
WHITE WIRE (NEUTRAL)
RED WIRE (LOAD OUT)

CIMCON Lighting, Inc. Controls Simplified	Drawn By: DJM
	Date: 8.13.15 Rev:
Description: Threaded Receptacle	
Part Number:	

iSLC 3100 7P 480 VAC Wiring Diagram

7-Pin Twist-Lock Dimming Receptacle (ANSI C136.41)





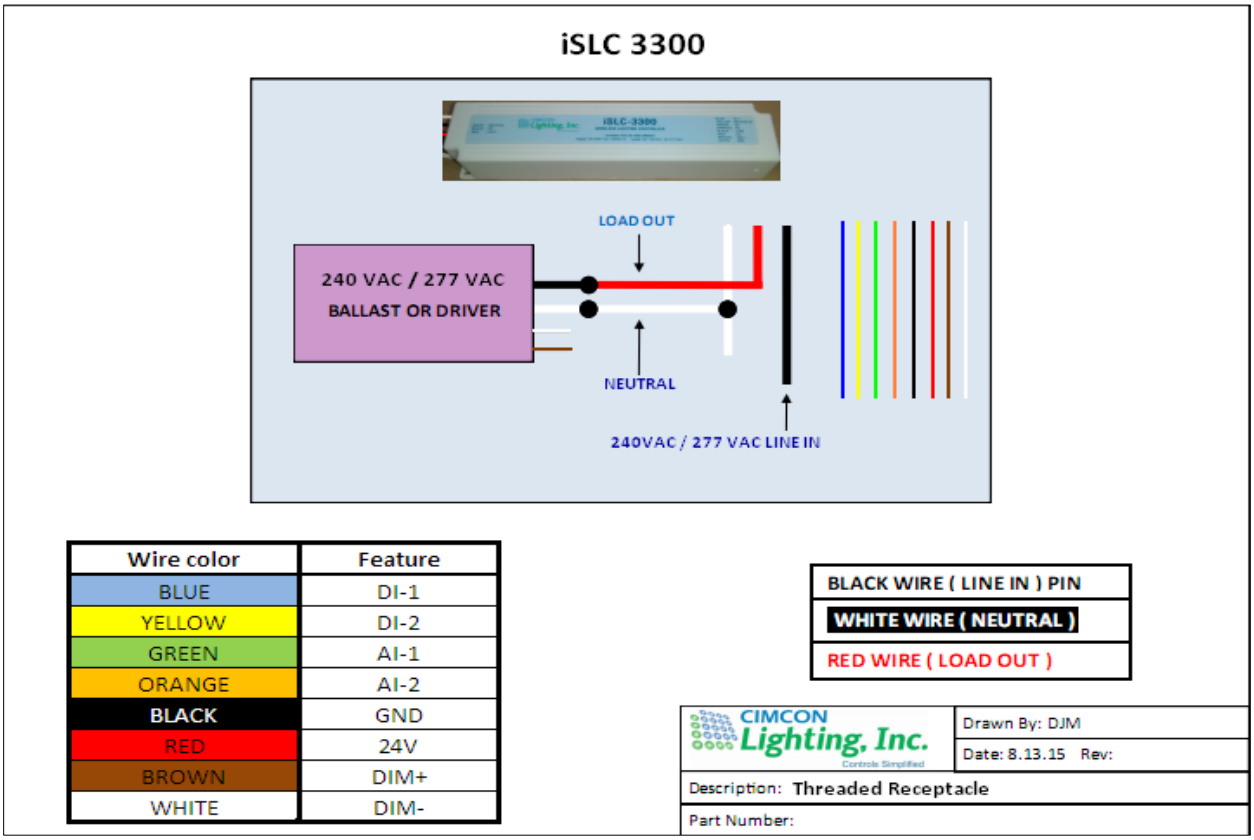
7-PIN RECEPTACLE SOURCE: www.Mouser.com

Mouser Electronics # 571-2213362-4

MFG.: TE Connectivity / AMP # 2213362-4

CIMCON Lighting, Inc. Controls Simplified	Drawn By: DJM
	Date: 8.13.15 Rev:
Description: 7-Pin Twist-Lock Dimming Receptacle (ANSI C136.41)	
Part Number: ANSI C136.41 - AMP #2213362-4	

iSLC 3300 Wiring Diagram



Wire color	Feature
BLUE	DI-1
YELLOW	DI-2
GREEN	AI-1
ORANGE	AI-2
BLACK	GND
RED	24V
BROWN	DIM+
WHITE	DIM-

iSLC 4000-7P PLCC Wiring Diagram