ADVANCE

# Advance Express

## Replacement Programmable LED Driver Program

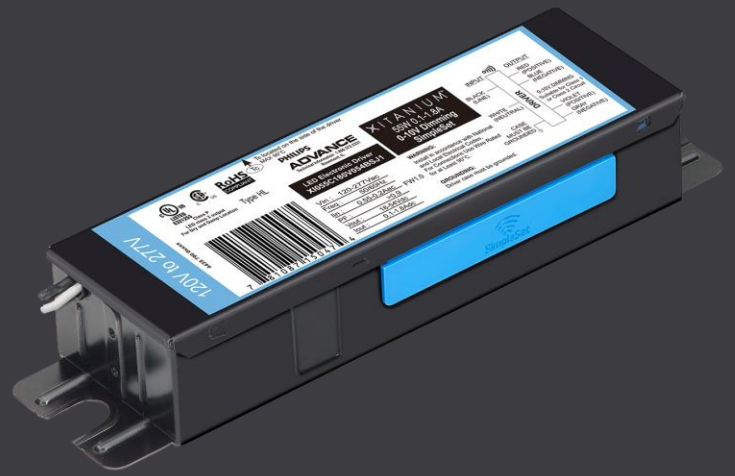
August 2024

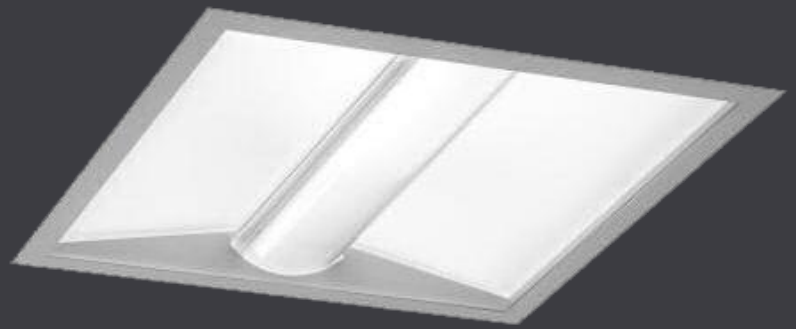
# Topics

1. What is Advance Express?
2. UL's Conditions for Field Replacement of Drivers
3. Gathering Information From The Failed Driver
4. Identifying A Replacement Driver
5. Programming The Replacement Driver
6. Helpful Information By Luminaire Type
7. Frequently Asked Questions

## Appendix

- How to read an Advance model number
- Common cross references for replacement LED drivers
- NEMA guidelines on replacement drivers



# 1. What is Advance Express?

Advance Express is a program for the replacement of LED drivers. The program includes the following:

**Recommended list of programmable LED drivers**

UL approved drivers for field replacement (Class P listed)
- Recommended list of 12 Advance LED drivers to stock
- Portfolio of 0-10V products

**Instructions on selecting the replacement driver**

- Gathering information from the failed driver
- Selecting the correct driver

**Programming application and label printing**

MultiOne Express programming link
MultiOne Mobile programming app link
- Easily and wirelessly program drivers
- Print labels easily for the replacement LED driver

**Programming wand**

- Wireless programming via NFC
- Advance programming tool LCN9620



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# 2. UL's Conditions for Field Replacement of Drivers

How does UL allow for LED Replacement Drivers?
1. Must be a UL Listed Component
2. Must be set to less than or equal to the power of the failed driver

## Listed LED drivers can be used for field replacement of LED drivers (even recognized drivers) in luminaires

### Recognized vs. Listed Component

When LED lighting was introduced, UL required each luminaire to have a specific make and model driver approbated in its file. Therefore, a replacement driver had to be the exact make and model as the original driver. This program is called a **UL Recognized Component**. The symbol is seen below (backwards "UR" symbol).
If the driver was approbated through Intertek, it will have the Intertek logo and it will not state class P below the symbol:





As LED lighting became more established, UL announced a new classification: UL **Listed Components. This is also known as "class P" or "class P listed".** With this classification, the replacement driver only needs to have the same characteristics as the original driver. If the driver was approbated through Intertek, it will have the Intertek logo and it will state class P below the symbol.



The symbol above states "Listed" below the UL Circle, and states "Class P" below both.

# 2. UL's Conditions for Field Replacement of Drivers

Power Requirements

**UL requires that a replacement driver delivers the same amount of power (Watts), or less than the original driver**

- Requirement from UL, CSA and ETL
- Important for safety
- Information on the power being provided by the failed driver can be found on the driver label

**For Reference:**

- **Power = Current x Voltage**
- **Power units are Watts (W)**
- **Current units are Amps (A), or milliAmps (mA)**
- **Current is sometimes shown with the uppercase letter "I" or written as "I out" or "Output current"**
- **Voltage units are Volts (V)**

# 3. Gathering Information From The Failed Driver

## Class 2 Drivers vs. Non-Class 2 Drivers

When replacing a driver, it is important to know if the original driver is a class 2 driver or not (referred to as “non-class 2” or sometimes “class 1”).

- Class 1 = Not class 2. Class 1 drivers have higher wattage and/or higher voltage than class 2 drivers

- Class 2 = safety circuitry is added to the driver AND, the driver will be < 100W and < 60V’s

**RULE: you need to replace a class 2 driver with another class 2 driver.**

NOTE: Generally, a non-Class 2 driver will exceed the power or voltage or current limitations of Class 2, so there will not be a matching Class 2 substitute. But, if a Class 2 driver matches the necessary power, current and voltage of the incumbent non-Class 2 driver, it can be used as a replacement.

# 3. Gathering Information From The Failed Driver

| Data: | Response: | | |
|---|---|---|---|
| **Luminaire type?** | Downlight,<br>Troffer,<br>Highbay,<br>Outdoor | | |
| **Line Voltage?** | 120, 277, 347, 480 | | |
| **Class 2 or not?** | Class 2<br>Non-Class 2 | | |
| **Constant Current or Voltage?** | Constant Current or Voltage? | | |
| **What is the Output Current?** | XXX | | |
| **What is the Output Voltage Range?** | XXX | | |
| **Dimming Protocol** | None,<br>0-10V, LE, TE, DALI | | |
| **Min Dim Level** | XXX | | |
| **Size of Driver Inches** | L | W | H |
| | | | |

**This checklist can be used to gather all needed information to help select a potential replacement driver**


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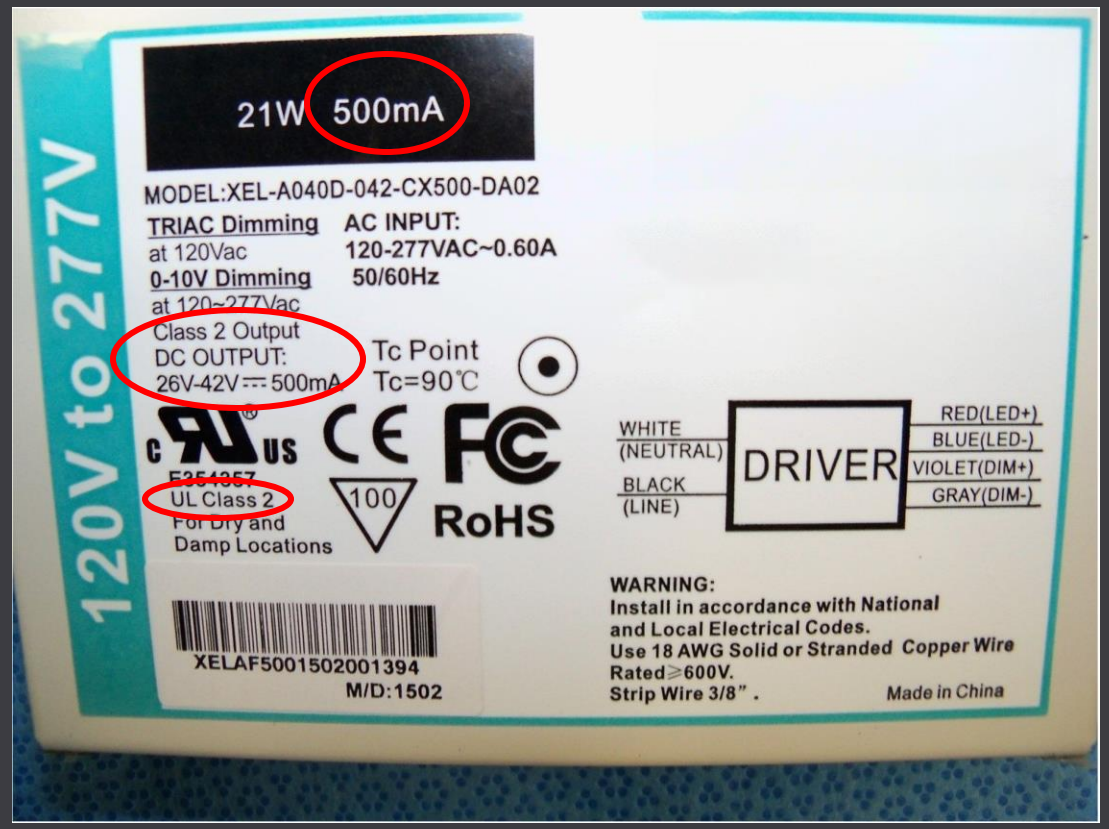
# 3. Gathering Information From The Failed Driver




In this example, the driver is a:

- Class 2 Driver
- Constant Current of 500 mA
- Voltage range of 26-42 Volts

**Ask the customer:**

- What type of luminaire?
- What is the line voltage?
- Is it on a dimmer? If so, what type?
- What is the driver's size?

**Obtain information from the failed driver (on the label):**

**1. Is it class 2 or not?**

- Look under the UL, CSA, or ETL symbol on the label

**2. Is it a constant current or constant voltage driver?**

- The label may explicitly state this, or…
- It may give 1 Output Current and a rang of Output Voltages= Constant Current
- If may give 1 Output Voltage and a range of Output Currents= Constant Voltage

**3. What is the voltage range?**

NOTE: If the existing LED driver is a programming driver, secondary labels may be present

# 3. Gathering Information From The Failed Driver


In this example, the driver is a:

- Class 2 Driver
- Constant Current of 350 mA
- Voltage range of 16-48 Volts

**Driver labels may look different, but all information should still be available:**

NOTE: A driver is a **constant current** driver when it regulates the current directly for the specified range of LED voltage.

**Constant voltage** drivers regulate a fixed voltage at the output, and the LED modules (or light engines) need to have additional on-board circuits to regulate the current in the LEDs.



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# Constant Voltage LED Drivers

**Applications where LED drivers usually include Constant Voltage:**

- Backlights, inside or outdoor signs
- Refrigeration display lights (freezer lights)
- Undershelf display lighting

**Advance Express does not include programmable Constant Voltage Drivers.**

- Class P listed 24V Constant Voltage Drivers are available- commonly paired with signs or RDL (XI100C410V024CNS1)





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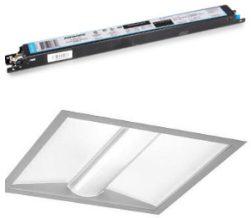
# 4. Identifying A Replacement Driver

Use the information gathered from the failed driver to select the replacement driver. Follow the UL rules.

The Advance Express program includes 12 commonly used LED drivers that will be suitable replacements for the majority of applications

- All SKUs are Class P
- All SKUs are wirelessly programmable
- Additional SKUs are available for unique applications

| | SKU | Ordering Code | Line Voltage Vac | Max Power W | Current Range | Voltage Range |
|---|---|---|---|---|---|---|
| **Downlight** | | | | | | |
|  | XI025C100V054BSM2 | 929002720813 | 120-277 | 25 | 100 - 1000 | 10-54 |
| | XI036C140V054BSM2 | 929002721013 | 120-277 | 36 | 100 - 1400 | 10-54 |
| **Linear** | | | | | | |
|  | XI020C056V054BST4 | 929002768113 | 120-277 | 20 | 100- 560 | 10-54 |
| | XI030C090V054BST4 | 929002768213 | 120-277 | 30 | 100- 900 | 10-54 |
| | XI040C100V054BST4 | 929002768313 | 120-277 | 40 | 100- 1000 | 10-54 |
| | XI050C140V054BST4 | 929002768413 | 120-277 | 50 | 100 - 1400 | 10-54 |
| | XI075C200V054BST4 | 929002768513 | 120-277 | 75 | 100 - 2000 | 10-54 |
| | XI085C240V054BST1 | 929002756513 | 120-277 | 85 | 700 - 2400 | 10-54 |
| **Outdoor & Industrial** | | | | | | |
|  | XI055C180V054BSJ1 | 929000795213 | 120-277 | 55 | 100 - 1800 | 18 - 54 |
| | XI095C275V054BSF2 | 929001782413 | 120-277 | 95 | 100 - 2750 | 20 -54 |
| | XI180C125V200BSF2* | 929001782813 | 120-277 | 180 | 100 - 1250 | 70- 210 |
| | XI190C275V054BSG1 | 929000744513 | 120-277 | 190 | 100- 2750 | 27 -54 |
|  | | | | | | |

* All SKUs above are class 2 except XI180C125V200BSF2



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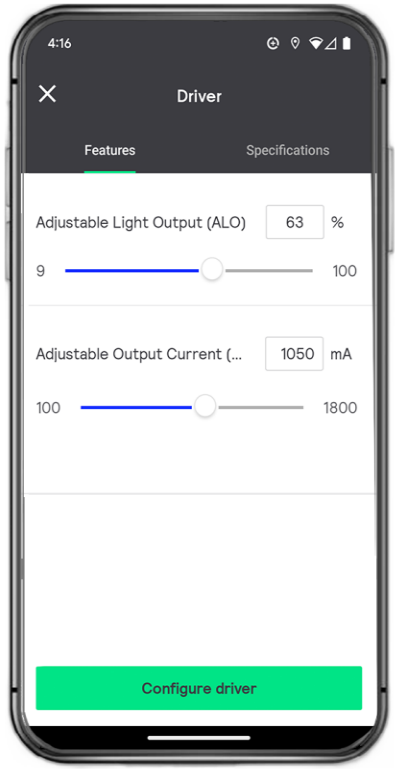
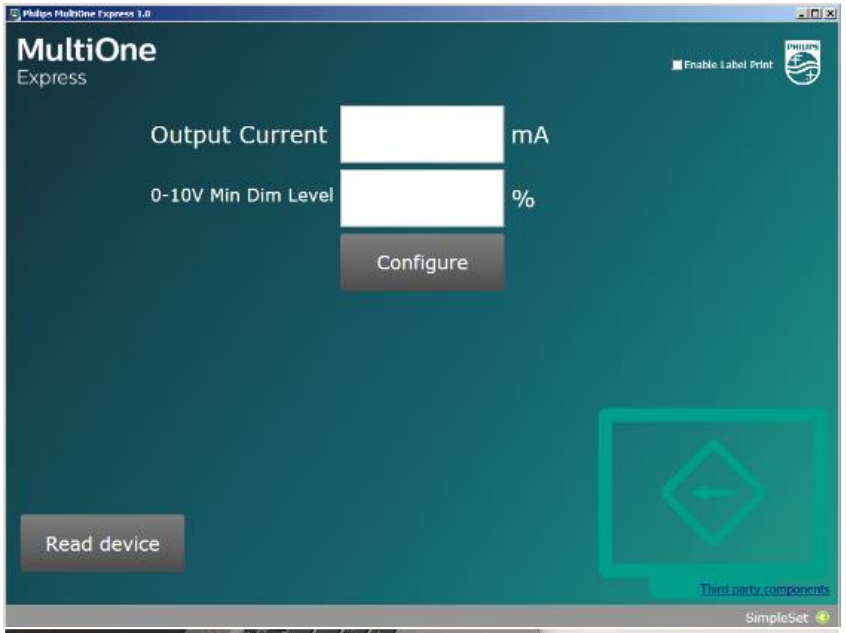
# 5. Programming An Advance LED Driver

**To program an Advance driver, you will need:**

- The programming wand – LCN9620 (929000999506)
  - NFC based
  - Order through your Advance sales rep
- Programming application (pc or mobile based)
  - MultiOne Express (pc based)
    - To download:
    - Head to www.signify.com/advanceexpress
    - Scroll down to ‘MultiOne Express Configuration System’
    - Click on: Download MultiOne Express
  - MultiOne Mobile (Android phone based)
    - Head to the Google Play Store
    - Search for ‘Signify MultiOne Mobile’
    - Download onto device*

*Signify MultiOne Mobile is only available for Android devices.




NOTE: The Advance programming protocol is called “SimpleSet”

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# 5. Programming An Advance LED Driver

## Advance LED drivers are simple to program in the field

NOTE: there is no need to power the driver when programming

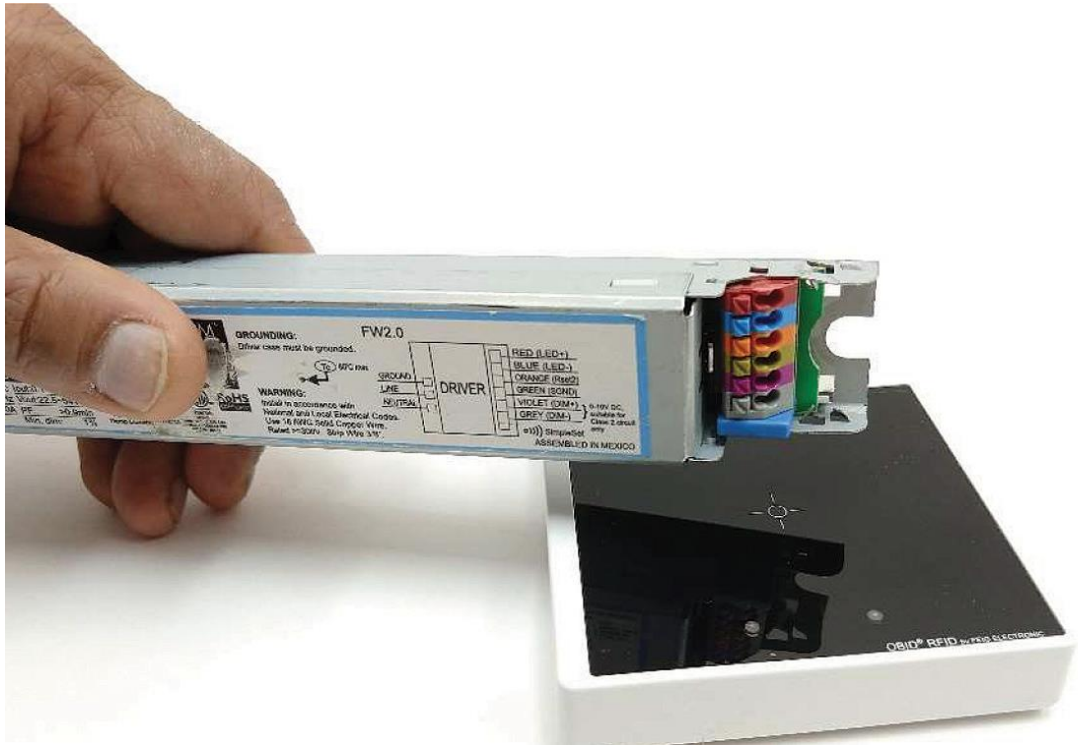
The following characteristics are programmable:

- Adjustable Output Current
- Adjustable Light Output
- Minimum Dimming level
- Dynadimmer (automatic dimming)

You can also:

- Read and write the settings of the driver using the NFC programming tool

- Clone identical drivers
  (configure multiple devices with the same settings)



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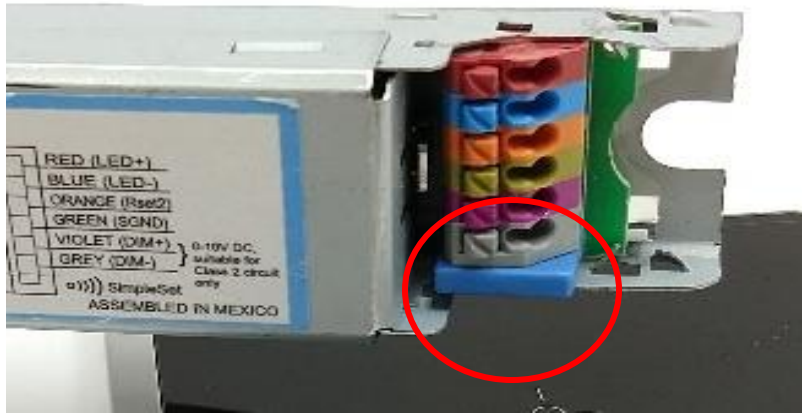
# 5. Programming An Advance LED Driver

## Locating the NFC antenna on the driver

Locate the blue square on the end of the linear driver

OR

Locate the blue rectangle on the side of the downlight, outdoor, or industrial driver





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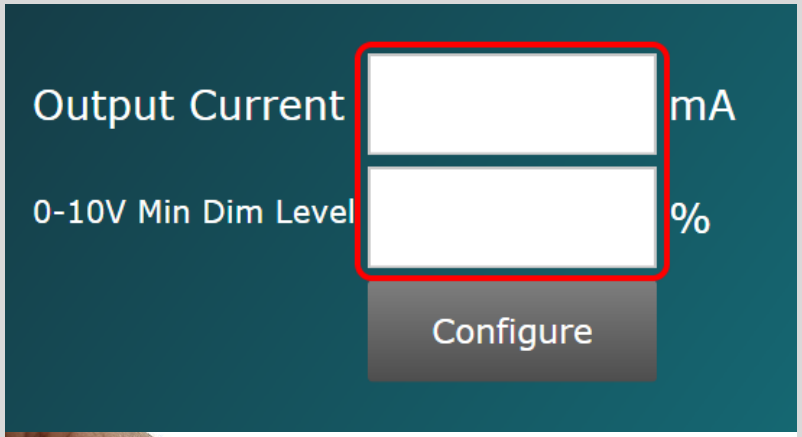
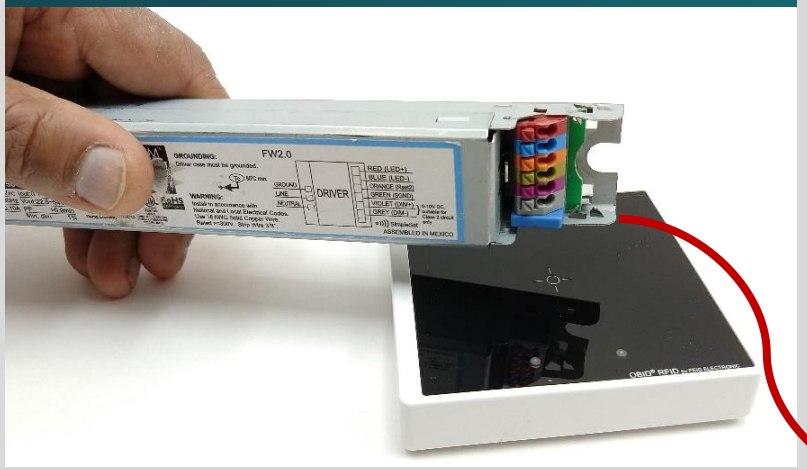
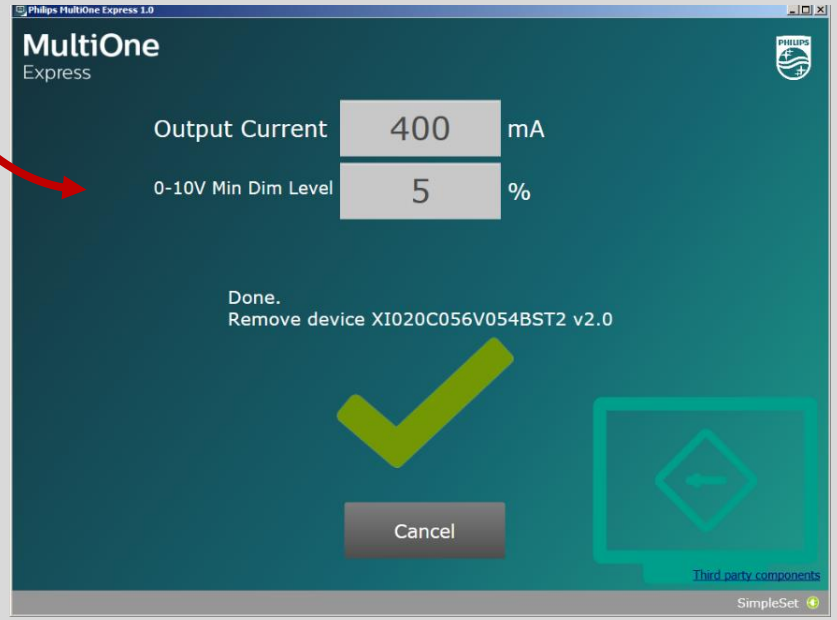
# 5. Programming An Advance LED Driver

To program an Advance LED driver using the MultiOne program, follow the steps below:

1. Enter value of current in mA
2. Click configure
3. Hold the driver to the antenna steady over the “X” on the NFC programming tool
4. Wait for the software to program
    1. Will get a green check or red X
    2. When receiving a green check- a label will print
5. Remove the driver



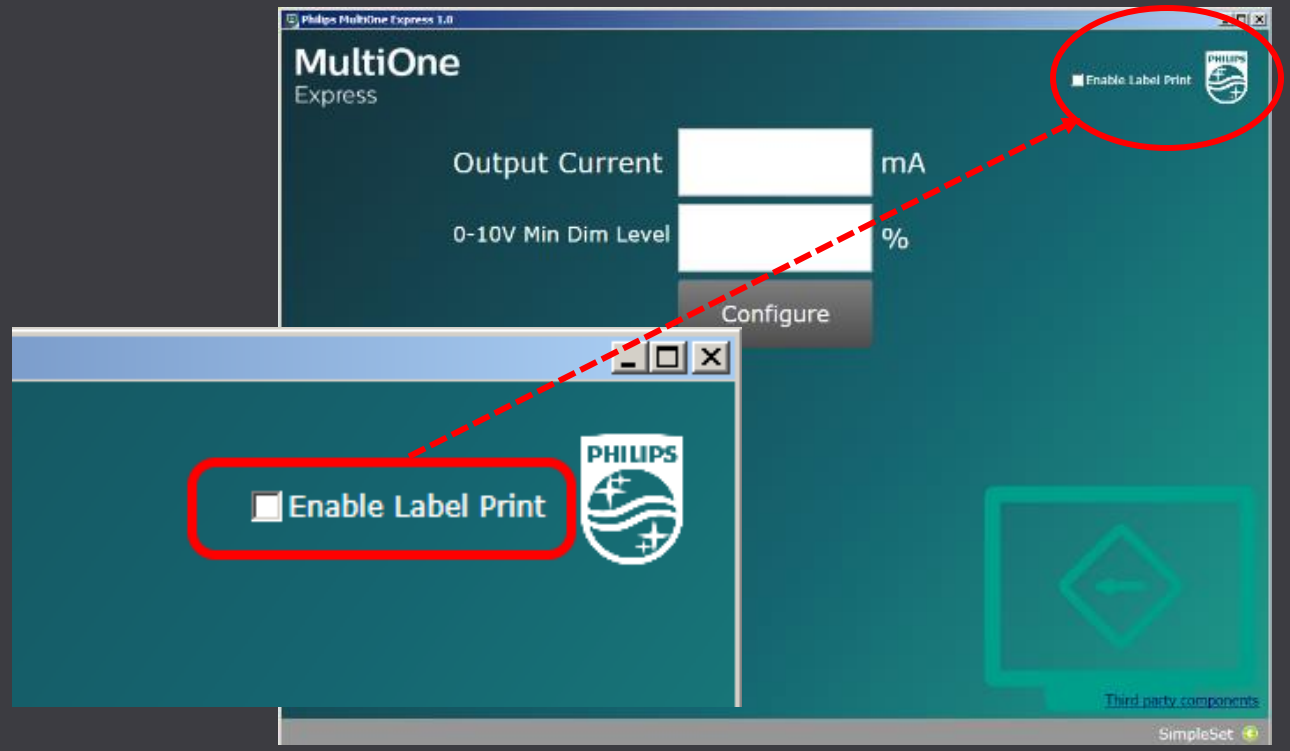



# 5. Programming an Advance LED Driver

## Printing the label for the replacement LED driver

You can use the MultiOne program to easily print the label for the replacement driver:

- Click on the “Enable Label Print” box
- No third-party software is needed







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# 6. Helpful Information By Luminaire Type

# Downlight LED Drivers

## There Are Two Mounting Styles:

**Bottom mount:** leads come out the bottom of the driver directly to J-Box

**Side mount:** leads come out the sides and must be inside a driver compartment

Advance offers several programmable drivers for downlight driver replacement

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# Outdoor LED Drivers

Low lumen light output luminaires, such as wall packs and bollards, are usually constant current, class 2 applications

- The **XI055C180V054BSJ1** covers most of these applications

High lumen and output luminaires such as area lighting or canopy lighting are often constant current, non-class 2

- Often have more than one driver in the luminaire
- The **XI180C125V200BSF2** covers several popular combinations

# Industrial High Bay LED Drivers

These drivers are usually constant current and are split between Class 2 and non-Class 2.

Reminder: Check for Class 2 marking

- **XI190C275V054BSG1 or XI095C275V054BSF2** are for constant current Class 2 luminaries

- **XI180C125V200BSF2** is for constant current non-Class 2 luminaries

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# Linear Troffer LED Drivers

Linear Troffers usually use constant current, Class 2 drivers

Recommended drivers include, but are not limited to:

- **XI020C056V054BST4**
- **XI030C090V054BST4**
- **XI040C100V054BST4**

# Differentiation From TLEDs

- There are several types of TLEDs (A,B,C, etc) and these are a combination of LAMPS and TLED Drivers that are designed to work together with a socket
- We recommend that you DO NOT use any of the LED Drivers from Advance Express with TLEDs.  You need to use the approved TLED drivers only

# 7. Frequently Asked Questions

A maintained list of frequently asked questions on the Advance Express program and how to replace a failed driver can be found here:

signify.com/advanceexpress

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# Appendix

# How to Read An Advance Product Number

What do the letters in the driver name mean?

EXAMPLE: **XI055C180V054BSJ1**

X = Xitanium Brand

I = 120 -277 Line Voltage

055 = Max Out Power is 55 W

C180 = Max Output current is 1.8A or 1800mA

V054 = Max Output Voltage is 54 Volts

B = 0-10V Dimming, AOC (Adjustable Output Current)

S = SimpleSet Wireless Programming Technology

J = J can

1 = Generation 1

NOTE: The names are a quick way to know the properties of the driver, but there are variations.

EG: the **XI180C125V200BSF1** has max output voltage of 210V

| X | I | 075 | C070 | V105 | C | N | Y | 1 | M |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Packaging:<br>M=Midpack |
| | | | | | | | | Version Control:<br>1=Version 1, 2=Version 2, ... | |
| | | | | | | | Enclosure Designation | | |
| | | | | | | Features:<br>P=Programming S=SimpleSet<br>N=Non-Programming | | | |
| | | | | | Fixed or Dimming:<br>B=0-10V, AOC R=Leading Edge & Trailing Edge Dimming<br>C=0-10V S=Step Dim<br>D=0-10V, AOC, MTP V=Sensor Ready<br>F=Fixed X=0-10V, AOC, MTP, CLO (linear)<br>K=DALI, 0-10V, MTP X=TE, 0-10V, AOC, MTP, FAN (downlight)<br>M=DALI, 0-10V, AOC, MTP Y=DALI, AOC, MTP, CLO<br>P=Aux Power Supply | | | | |
| | | | | Max Voltage:<br>Examples:<br>012=12V, 054=54V, 280=280V | | | | | |
| | | | Max Current:<br>Examples:<br>035=350mA, 070=700mA, 053=530mA, 105=1050mA | | | | | | |
| | | Max Power:<br>Examples:<br>025=25W, 060=60W, 300=300W | | | | | | | |
| | Input Voltage:<br>I=120-277V G=347V<br>R=120V H=347-480V<br>V=277V J= 277-480V | | | | | | | | |
| General:<br>X= Xitanium LED Driver, C=CertaDrive | | | | | | | | | |

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# Recommended Drivers To Stock Organized By Luminaire Type

| Luminaire Type | Advance Part Number | Input Voltage | Class 2 Y/N | Constant Curent or Constant Voltage | Output Current (mA) | Output Voltage (V) | Dimming Protocol | Min Dim Level | Dimensions (LxWxH) inches | Advance Ordering Code | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DownLight / Can Light | XI025C100V054BSM2 | 120- 277 | Class 2 | Constant Current | 100 - 1000 | 10 - 54 | 0-10V | 1% | 5.00 x 2.38 x 0.98 | 929002720813 | Bottem Entry Driver. Covers a wide range of the most common downlight powers |
| | XI036C140V054BSM2 | 120- 277 | Class 2 | Constant Current | 100 - 1400 | 10 - 54 | 0-10V | 1% | 5.00 x 2.38 x 0.98 | 929002721113 | Bottem Entry Driver. Covers a wide range of the most common downlight powers |
| | | | | | | | | | | | |
| Troffer/ Linear | XI020C056V054BST4 | 120- 277 | Class 2 | Constant Current | 100- 560 | 10 - 54 | 0-10V | 1% | 10.0 x 1.18 x 1.00 | 929002768113 | Covers a wide range for common 2' troffer powers |
| | XI030C090V054BST4 | 120-277 | Class 2 | Constant Current | 100- 900 | 10 - 54 | 0-10V | 1% | 11.0 x 1.18 x 1.00 | 929002768213 | A good cross for the OTi30/120-277/ |
| | XI040C100V054BST4 | 120- 277 | Class 2 | Constant Current | 100- 1000 | 10 - 54 | 0-10V | 1% | 14.17 x 1.18 x 1.00 | 929002768313 | Covers a wide range for common 2' troffer powers |
| | XI050C140V054BST4 | 120- 277 | Class 2 | Constant Current | 100 - 1400 | 10 - 54 | 0-10V | 1% | 14.17 x 1.18 x 1.00 | 929002768413 | A good cross for the OTi50/120-277/1A4 DIM-1 L |
| | XI075C200V054BST4 | 120- 277 | Class 2 | Constant Current | 100- 2000 | 10- 54 | 0-10V | 1% | 16.7 x 1.18 x 1.00 | 929002768513 | Covers a wide range for common 4' troffer powers |
| | XI085C240V054BST1 | 120- 277 | Class 2 | Constant Current | 700 -2400 | 10- 54 | 0-10V | 1% | 16.7 x 1.18 x 1.00 | 929002756513 | A good cross for the OTi85/120-277/2A3 DIM-1 L |
| | | | | | | | | | | | |
| Outdoor / Industrial | XI055C180V054BSJ2 | 120- 277 | Class 2 | Constant Current | 100 - 1800 | 18 - 54 | 0-10V | 10% | 6.61 x 1.79 x 1.12 | 929002766013 | Small enough for a bollard, garage or small flood light |
| | XI095C275V054BSF2 | 120- 277 | Class 2 | Constant Current | 100 - 2750 | 20 - 54 | 0-10V | 5% | 9.45 x 2.31 x 1.48 | 921782900413 | Covers a wide range of high bay applications |
| | XI180C125V200BSF1 | 120- 277 | No | Constant Current | 100 - 1250 | 70 - 210 | 0-10V | 10% | 9.45 x 2.31 x 1.48 | 929000749513 | Class 1 driver for outdoor or High bay applications. A good cross for OT180W/UNV/1250C/2DIM/P6 |
| | XI190C275V054BSG1 | 120- 277 | Class 2 | Constant Current | 100 - 2750 | 27 - 54 | 0-10V | 5% | 16.7 x 1. 8 x 1.22 | 929000744513 | Popular for Class 2 Highbay's |

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NOTE: there are additional drivers available in the Advance Express program such as 347-480V. The list above includes the most common replacement LED drivers

# Cross Refences To Non-Advance Drivers

| Luminaire Type | OSRAM or ULT | Advance Part Number | Input Voltage | Class 2 Y/N | Constant Curent or Constant Voltage | Output Current (mA) | Output Voltage (V) | Dimming Protocol | Min Dim Level | Dimensions (LxWxH) inches | Advance Ordering Code |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Troffer/ Linear | OTi50/120-277-277/1A Dim-1 L | XI050C140V054BST4 | 120-277 | Class 2 | Constant Current | 100 - 1400 | Oct-54 | 0-10V | 1% | 14.17 x 1.18 x 1.00 | 929002768413 |
| | OTi85/120-277/2A3 Dim-1 L | XI085C2400V054BST1 | 120- 277 | Class 2 | Constant Current | 100 - 2400 | 20 - 54 | 0-10V | 1% | 16.7 x 1.18 x 1.00 | 929002756513 |
| | D21CC80UNVPW-C | XI085C2400V054BST1 | 120- 277 | Class 2 | Constant Current | 100 - 2400 | 20 - 54 | 0-10V | 1% | 16.7 x 1.18 x 1.00 | 929002756513 |
| | | | | | | | | | | | |
| Outdoor / Industrial | OT50/120-277/1A2/2DIM/LT2/P | XI055C180V054BSJ2 | 120- 277 | Class 2 | Constant Current | 100 - 1800 | 18 - 54 | 0-10V | 10% | 6.61 x 1.79 x 1.12 | 929002766013 |
| | D28CC95UNVPW-F | XI095C275V054BSF2 | 120- 277 | Class 2 | Constant Current | 100 - 2750 | 20 - 54 | 0-10V | 5% | 9.45 x 2.31 x 1.48 | 921782900413 |
| | OT180/UNV/125C/2DIM/P6 | XI180C125V200BSF1 | 120- 277 | No | Constant Current | 100 - 1250 | 70 - 210 | 0-10V | 10% | 9.45 x 2.31 x 1.48 | 929000749513 |

## Support for driver cross references:

- Signify General Lighting Inquiries: 1-800-555-00500

  Monday – Friday 8 a.m. – 8 p.m. EST

  OR

- On-line at: Contact us for innovative lighting solutions | Signify

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# What does NEMA say about LED Drivers and replacements?

NEMA white paper on field replacement of drivers- NEMA LSD-74-2016, download here

Includes:

1. Details for replacement drivers
    - "The programming parameter may 'live' in the driver but they are determined by the requirements of the light engine, so the fixture label or installation instructions should contain something about driver replacement and characteristics of the system."
        - This is important, as this is where NEMA states that OEMs should label, or include in the luminaire documentation, the values a programmable driver was programmed so it can be serviced
        - It also means that if you supply a replacement LED programmable driver, you need to label it with the programmed specifications

2. Confirms UL's position that replacement programmable drivers should be programmed to the original settings of the failed driver

3. Recommends against field tuning other than by qualified personnel. This is due to concern of violation of Title 24 or rebate criteria