CDB260 Series

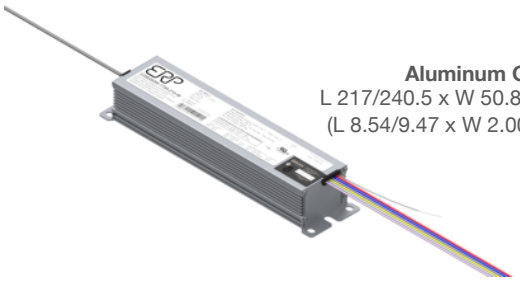
Simple Bluetooth® Controls

260 W

260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

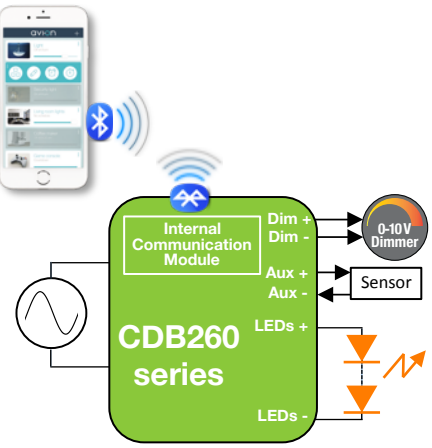
Nominal Input Voltage	Max. Output Power	Output Voltage	Output Current	Efficiency	Max. Case Temperature	THD	Power Factor	Dimming Method	Dimming Range
120/277 Vac nominal	260 W	114 to 400 Vdc	325 mA to 1700 mA CC	up to 93% typical	90°C (measured at the hot spot)	< 20%	> 0.9	0 - 10V	1 - 100% (% of Iout)

CC: Constant Current



Aluminum Case
L 217/240.5 x W 50.8 x H 38.5 mm
(L 8.54/9.47 x W 2.00 x H 1.52 in)

Avi-on App



FEATURES

- Non-linear 0-10V dimming profile with dim-to-off
- Auxiliary output 12 V/100 mA
- IP66-rated case with silicone-based potting
- Outdoor Surge protection:
  - IEC61000-4-5: 4 kV line to line/4 kV line to earth
  - 2.5 kV ring wave: ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A
- Conducted and radiated EMI: Compliant with FCC CFR Title 47 Part 15 Class A at 120 Vac & 277 Vac
- Lifetime: 50,000 hours @ Tc = 70°C
- 90°C maximum case hot spot temperature
- UL Class P

PROGRAMMING

- Dual output voltage range selection
- Serial port programming
  - Current: 100% to 50% in each voltage range
  - Data log read: SKU, S/N, lot code, hours of operation, FW rev., fault events: power failure, transients (short or surge), thermal

COMMUNICATION

- Bi-directional (dimming ↑ and ↓ and data log read)
- Bluetooth Mesh with wire whip antenna and external removable antenna

APPLICATIONS

- Outdoor & Indoor
- Horticulture grow lights
- Street lights, Area lights
- Industrial high-bay lights

AVI-ON BLUETOOTH MESH SOLUTION

- Wireless lighting controls with simple set-up that anyone can use
- Pre-integrated Bluetooth Smart + CSRmesh module enables brands to create multi-way controls and switching without additional wiring; no central gateway required
- Utility grade, secure, reliable mobile app & software
- Dimming, grouping, many users, schedules, timers
- Virtually unlimited range with mesh
- Download for free, additional services available
- Compatible with large ecosystem of products from major brands
- Avi-on battery-powered movable dimming switches available to complete the turnkey solution

Download on the App Store | GET IT ON Google Play

5 Year Warranty

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260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

1 - ORDERING INFORMATION

CDB260 □ – □ □ □ □ – □ □ □ – □

- **POWER**: Max power
- **AC VOLTAGE**: W: 120/277 Vac
- **CURRENT**: Max current in given voltage range
- **VOLTAGE RANGE**
- **COMMUNICATION**
  - **W**: Bluetooth Mesh bi-directional with whip antenna
  - **R**: Bluetooth Mesh bi-directional with external removable antenna connected to RPSMA connector located on the end cap of the case

Ordering Part Number	Nominal Input Voltage (Vac)	Max Output Power (W)	Iout 1 (mA)	Vout 1 Min. (Vdc)	Vout 1 Nom. (Vdc)	Vout 1 Max. (Vdc)	Open Loop (no load) Voltage 1 (Vdc)	Iout 2 (mA)	Vout 2 Min. (Vdc)	Vout 2 Nom. (Vdc)	Vout 2 Max. (Vdc)	Open Loop (no load) Voltage 2 (Vdc)	Comments
Dual Range													
CDB260W-0860-400-W	120/277	260	430 to 860	234	270	300	390	325 to 650	312	360	400	450	With wire whip antenna
CDB260W-0860-400-R	120/277	260	430 to 860	234	270	300	390	325 to 650	312	360	400	450	Enables the connection of an external removable antenna, using the RPSMA connector located on the end cap of the case.
CDB260W-1300-280-W	120/277	260	650 to 1300	156	180	200	260	465 to 930	218	252	280	350	With wire whip antenna
CDB260W-1300-280-R	120/277	260	650 to 1300	156	180	200	260	465 to 930	218	252	280	350	Enables the connection of an external removable antenna, using the RPSMA connector located on the end cap of the case.
CDB260W-1700-210-W	120/277	260	850 to 1700	117	135	150	195	620 to 1240	164	189	210	250	With wire whip antenna
CDB260W-1700-210-R	120/277	260	850 to 1700	117	135	150	195	620 to 1240	164	189	210	250	Enables the connection of an external removable antenna, using the RPSMA connector located on the end cap of the case.

For additional options of output current and output voltage, contact your sales representative or send an email to: SaveEnergy@ERP-Power.com

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260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

2 - INPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Input Voltage Range (Vin)	Vac	90	120/277	305	•The rated output current for each model is achieved at Vin≥108 Vac & at Vin≥198 Vac •At nominal load
Input Frequency Range	Hz	47	50/60	63	
Power Factor (PF)		0.9	> 0.9		•At nominal input voltage and with nominal LED voltage •From 100% to 50% of rated power
Inrush Current	A	Meets NEMA-410 requirements			•At any point on the sine wave and 25°C •Active limiting inrush current is available as an option. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com.
Leakage Current	µA			0.5 mA @ 120 Vac 1 mA @ 230 Vac 1.2 mA @ 277 Vac	Measured per IEC60950-1
Total Harmonics Distortion (THD)				20%	•At nominal input voltage and nominal LED voltage •From 100% to 50% of rated power •Complies with DLC (Design Light Consortium) technical requirements
Efficiency	%	-	up to 93%	-	Measured with nominal input voltage, a full sinusoidal wave form and without dimmer attached.
Isolation	•The AC input to the main output is Class I (with earth ground) •The AC input to the 0-10V output and to the Auxiliary output is Class II				
Standby Power				1 W @ 120 Vac	Measured with the following conditions: LED load off, no load on the auxiliary CV output, and dim-to-off.

3 - MAIN OUTPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc	114		400	See ordering information for details
Output Current (Iout)	mA	325		1700	•See ordering information for details •The rated output current for each model is achieved at Vin≥108 Vac & at Vin≥198 Vac.
Output Current Regulation	%	-5	±2.5	5	•At nominal AC line voltage •Includes load and current set point variations
Output Current Overshoot	%	-	-	10	The driver does not operate outside of the regulation requirements for more than 500 ms during power on with nominal LED load and without dimmer.
Ripple Current	≤ 30% of rated output current for each model				•Measured at nominal LED voltage and nominal input voltage without dimming •Calculated in accordance with the IES Lighting Handbook, 9th edition •The CDB260 series is also available with lower ripple <10%, as an option. Contact your ERP representative or send an email to SaveEnergy@erp-power.com.
Dimming Range (% of Iout)	%	1		100	•The dimming range is dependent on each specific dimmer. It may not be able to achieve 1% dimming with some dimmers. •Dimming performance is optimal when the driver is operated at its nominal output voltage matching the LED nominal Vf (forward voltage). Dimming performance may vary when the driver is operated near its minimum output voltage.
Start-up Time	ms			750	•Measured from application of AC line voltage to 100% light output •Complies with ENERGY STAR® luminaire specification
Isolation	The AC input to main output is Class I (with earth ground)				

4 - AUXILIARY OUTPUT, 12 V / 100 mA, SPECIFICATION (@25°C ambient temperature)

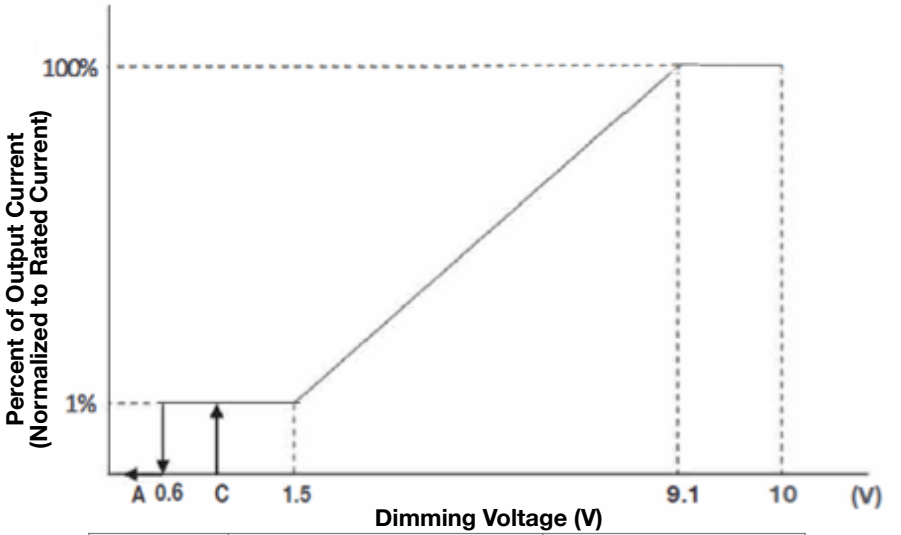
	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc	10.8	12	13	Other voltages (5 V, 24 V) and currents are available as an option. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com
Output Current (Iout)	mA		100		
Isolation from LED Output	Meets Class II reinforced/double insulation power supply ☐				
Isolation from AC Input	Meets Class II reinforced/double insulation power supply ☐				

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260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

5 - 0-10 V DIMMING CONTROL (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
+Dim Signal, -Dim Signal	The CDB260 series operate only with 0-10V dimmers that sink current. The method to dim the output current of the driver is done via the +Dim/-Dim Signal pins. The +Dim/-Dim signal pins can be used to adjust the output setting via a standard commercial wall dimmer, an external control voltage source (0 to 10 Vdc), or a variable resistor when using the recommended number of LEDs. The dimming input permits 1% to 100% dimming.				
Dimming Profile (see figure 1)	100% of output current between 10 V and 9.1 V, Linear between 9.1 V and 1.5 V, 1% of output current between 1.5 V and 0.6 V, Output current off below 0.6 V.				
Dimming Range	%	1		100	As a percent of the output current
High Level Voltage	V		9.1		
Low Level Voltage	V		1.5		
Dim to Off	V		0.6		
Current Supplied by the +Dim Signal Pin	mA			1	
Output Current Tolerance While Being Dimmed	%			±8	The tolerance of the output current while being dimmed is ≤ +/-8% until down to 1.5V.
Isolation	The 0-10 V circuit is isolated from both the AC input and the main DC output and meets for class II reinforced/double insulation power supply. ☐				



Dimming Voltage	Description	Value
A	in standby	< 600 mV
C	out of standby, hysteresis	> 700 mV, < 800 mV

Figure 1

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260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

6 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
Operating Ambient Temperature (Ta)	°C	-40		50	50°C is the non-derated temperature (Refer to section 8 "Output power de-rating at higher temperatures".
Maximum Case Temperature (Tc)	°C			+90	Case temperature measured at the hot spot •tc (see label in page 9)
Storage Temperature	°C	-40		+85	
Humidity	%	5	-	95	Non-condensing
Cooling	Convection cooled				
Acoustic Noise	dBA			22	Measured at a distance of 1 meter, without and with approved dimmers
Mechanical Shock Protection	per EN60068-2-27				
Vibration Protection	per EN60068-2-6 & EN60068-2-64				
MTBF	> 200,000 hours when operated at nominal input and output conditions, and at Tc ≤ 70°C				
Lifetime	50,000 hours at Tc ≤70°C maximum case hot spot temperature (see hot spot •tc on label in page 10)				

7 - EMC COMPLIANCE AND SAFETY APPROVALS

EMC Compliance			
Conducted and Radiated EMI		•FCC CFR Title 47 Part 15 Class A at 120 Vac and at 277 Vac, •EN55015 (CISPR 15) Class A compliant at 220, 230, and 240 Vac	
Voltage Fluctuations & Flicker		IEC61000-3-3	
Immunity Compliance	**ESD (Electrostatic Discharge)**	IEC61000-4-2	6 kV contact discharge, 8 kV air discharge, level 3
	RF Electromagnetic Field Susceptibility	IEC61000-4-3	3 V/m, 80 - 1000 MHz, 80% modulated at a distance of 3 meters
	Electrical Fast Transient	IEC61000-4-4	± 2 kV on AC power port for 1 minute, ±1 kV on signal/control lines
	Surge	IEC61000-4-5	•± 4 kV line to line (differential mode) /± 4 kV line to common mode ground (tested to secondary ground) on AC power port, ±0.5 kV for outdoor cables •Higher surge is available. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com.
	Conducted RF Disturbances	IEC61000-4-6	3V, 0.15-80 MHz, 80% modulated
	Voltage Dips	IEC61000-4-11	>95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods
Transient Protection	**Ring Wave**		ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave

Safety Agency Approvals	
UL	UL8750 recognized
cUL	CAN/CSA C22.2 No. 250.13-14 LED equipment for lighting applications
CE	IEC61347-2-13 electronic control gear for LED Modules

Safety					
	Units	**Minimum**	**Typical**	**Maximum**	**Notes**
Hi Pot (High Potential) or Dielectric voltage-withstand	Vdc	2500			•Insulation between the input (AC line and Neutral) and the output •Tested at the RMS voltage equivalent of 1767 Vac

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8 - PROTECTION FEATURES

Under-Voltage (Brownout)
The CDB260 series provides protection circuitry such that an application of an input voltage below the minimum stated in section 1 (Input Specification) shall not cause damage to the driver.

Short Circuit and Over Current Protection
The CDB260 series is protected against short-circuit such that a short from any output to return shall not result in a fire hazard or shock hazard. The driver shall hiccup as a result of a short circuit or over current fault. Removal of the fault will return the driver to within normal operation. The driver shall recover, with no damage, from a short across the output for an indefinite period of time.

Internal Over temperature Protection
The CDB260 series is equipped with internal temperature sensor on the primary power train. Failure to stay within the convection power rating will result in the power supply reducing the available current (fold back) below the programmed amount. The main output current will be restored to the programmed value when the temperature of the built-in temperature sensor cools adequately.

Output Open Load
When the LED load is removed, the output voltage of the CDB260 series is typically limited to 1.3 times the maximum output voltage of each model.

Over Power Protection
The driver will shut down and auto recover when its input power exceeds approximately 110% of 260W. This condition will cause no damage to the power supply.

9 - OUTPUT POWER DE-RATING AT ELEVATED TEMPERATURES

The CDB260 series can be operated with cooling air temperatures above 50°C by linearly de-rating the total maximum output power (or current) by 2.5%/°C from 50°C to 70°C (see figure 2).

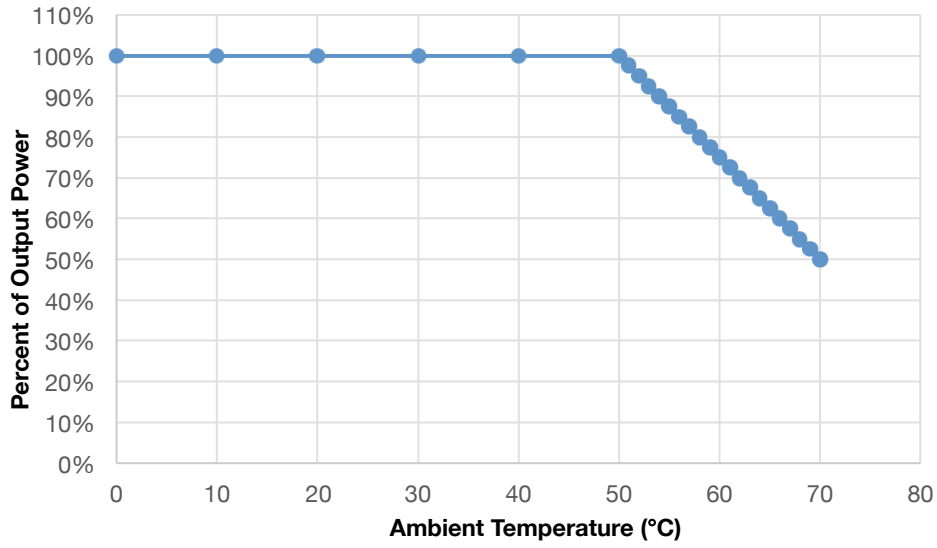


Figure 2

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260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

10 - 0-10 V DIMMING

The CDB260 series operate only with 0-10V dimmers that sink current. They are not designed to operate with 0-10V control systems that source current, as used in theatrical/entertainment systems. Developed in the 1980's, the 0-10V sinking current control method is adopted by the International Electrotechnical Commission (IEC) as part of its IEC Standard 60929 Annex E.

The method to dim the output current of the driver is done via the +Dim/-Dim Signal pins. The +Dim/-Dim Signal pins respond to a 0 to 10 V signal, delivering 1% to 100% of the output current based on rated current for each model. A pull-up resistor is included internal to the driver. When the +Dim wire (purple) is short circuited to the –Dim wire (grey) or to the –LED wire (blue), the output current turns off and the driver enters standby mode.
If the +Dim input is > 10 V or open circuited, the output current is programmed to 100% of the rated current.
When not used, the –Dim wire (grey) and to the +Dim wire (purple) can be individually capped or cut off. In this configuration, no dimming is possible and the driver delivers 100% of its rated output current.

The maximum source current (flowing from the driver to the 0-10V dimmer) supplied by the +Dim Signal pin is ≤ 1 mA. The tolerance of the output current while being dimmed shall be +/-8% typical until down to 1.5 V.

The non-linear 0-10V dimming profile is the default profile across all models of the PDB series. In the non-linear 0-10V dimming profile, shown in figure 3, 10V to 9.1V=100% of the output current, 1.5V to 0.6V=1%, <0.6V=dim-to-off).
The non-linear curve is recommended when using standard in wall 0-10 V logarithmic dimmers to avoid having insufficient source current available to pull the dimmer up to 10V and to account for the inability of the dimmer to pull below approximately 0.9V. In these type of installations, the modified transfer function will ensure 100% light output and dimming to 1%, regardless of the number of drivers on the 0-10V dimming line. Please contact your sales representative or send an email to: SaveEnergy@erp-power.com for additional information.

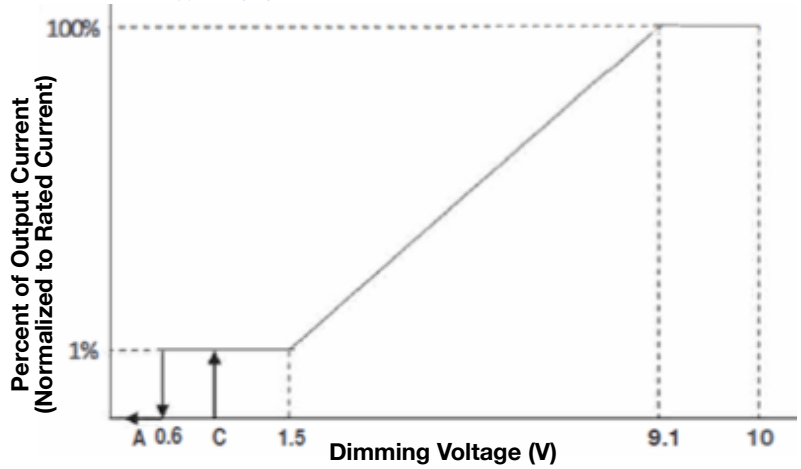


Figure 3

Dimming Voltage	Description	Value
A	in standby	< 600 mV
C	out of standby, hysteresis	> 700 mV, < 800 mV

11 - COMPATIBLE 0-10 V DIMMERS

- Lutron, Nova series (part number NFTV)
- Lutron, Diva series (part number DVTV)
- Leviton, IllumaTech series (part number IP710-DL)

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12 – DIFFERENT TYPES OF ANTENNA FOR COMMUNICATION MODULE

A communication module is integrated inside the driver case. Bluetooth Mesh is the communication protocol that is currently supported. Other communication protocols (such as DALI, ZigBee, DMX, etc…) will be available later. For more information on future communication protocols, please contact your ERP sales representative or send an email to SaveEnergy@erp-power.com.

Two different types of antennas are currently supported:

- A removable external antenna that can be connected to the RPSMA connector, on the end cap of the case. See figure 4. Please add the suffix “R” at the end of the part number to order the CDB260 driver with the RPSMA connector. For example: CDB260W-0860-400-R.
  NOTE THAT THE REMOVABLE EXTERNAL ANTENNA IS NOT INCLUDED WITH THE DRIVER. IT MUST BE PURCHASED SEPARATELY.
- A fixed whip antenna (see figure 5), included with the driver. Please add the suffix “W” at the end of the part number to order the CDB260 driver with the whip antenna. For example: CDB260W-0860-400-W.

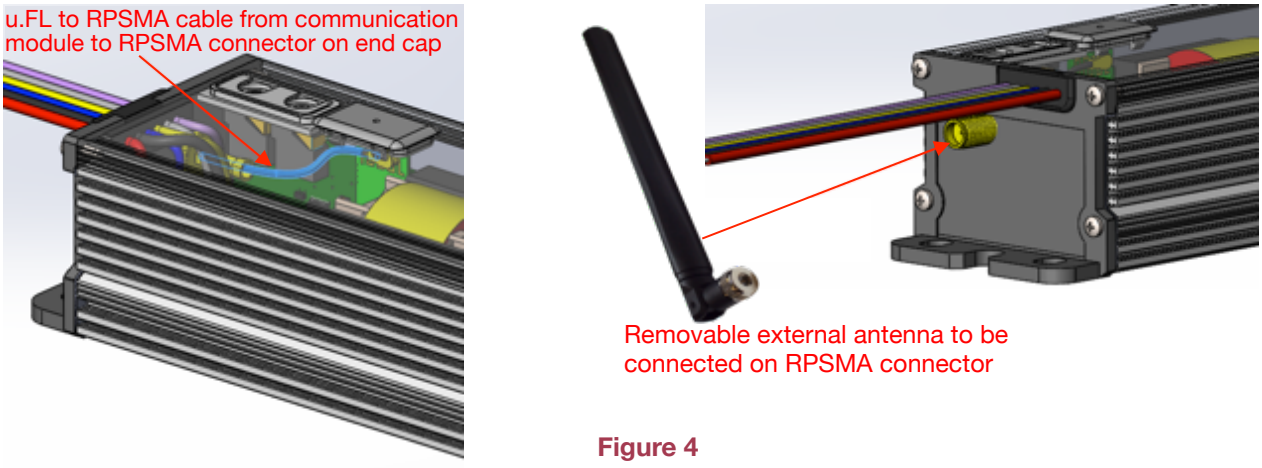


Figure 4

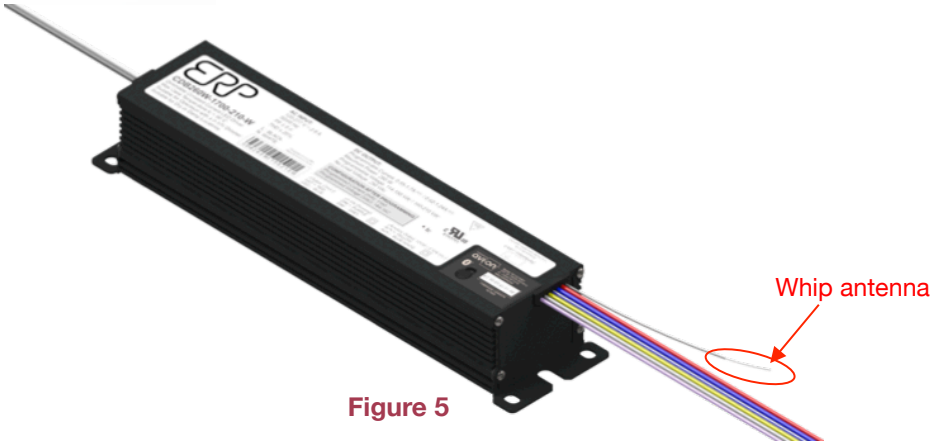


Figure 5

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13 - PROGRAMMING

The CDB260 series can be programmed by inserting the audio jack of the cable shown in figure 6 into the driver and by plugging the USB other end of the cable into a computer. **It cannot be programmed by using the integrated communication module.**
The driver does not need to be powered on during the programming process.
Programming is done by using the ERP GUI (Graphical User Interface) which enables to trim or adjust the following parameters:

1) Selection of output voltage range.
2) Output current from 100% to 50% in each voltage range.
   For example, assuming you wish to program the CDB260-1700-210. If you select the voltage range of 160 to 210 V, the current can be programmed to any value between 620 and 1240 mA. Or if you select the output voltage range of 114 to 150 V, the output current can be programmed to any value between 850 and 1700 mA.

Furthermore, when connecting the driver to a computer using the programming cable, you can access the driver's internal data log and read the following information: SKU, serial number, manufacturing lot code, hours of operation, firmware revision, and fault events: power failure, transients (short or surge), thermal events (i.e. number of times the case temperature has exceed the maximum case temperature of 90°C).
The driver's internal log can also be accessed by using the integrated communication module.
For more information, please refer to the GUI user's manual.



Figure 6

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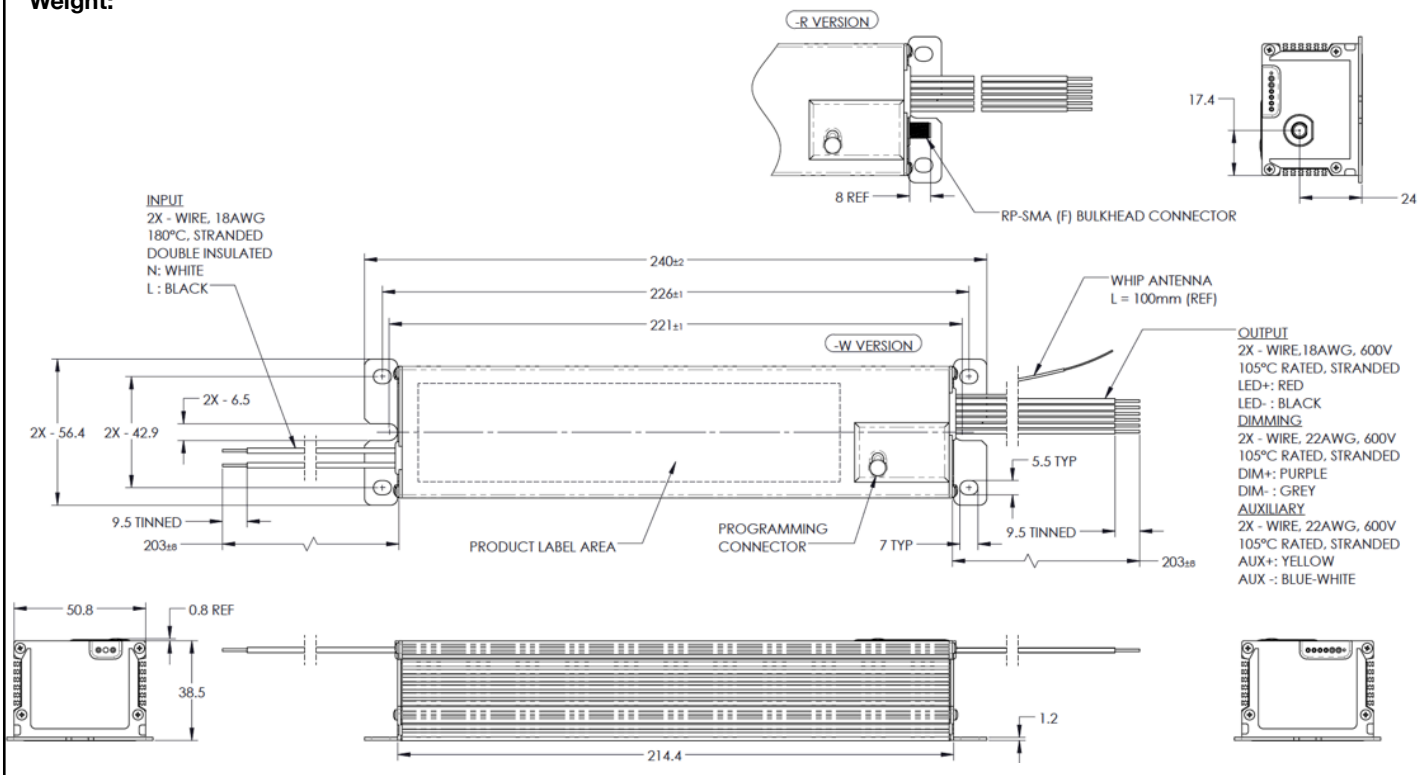
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14 - MECHANICAL DETAILS

Packaging Options: Aluminum case
I/O Connections: Flying leads, 18 AWG on power leads, 22 AWG on 0-10V dimming wires and on auxiliary output, 203mm (8 in) long, 105°C rated, stranded, stripped by approximately 9.5mm, and tinned. All the wires, on both input and output, have a 600 V insulation rating.
Ingress Protection: IP66 rated
Mounting Instructions: The CDB260 driver case must be secured on a flat surface through the two mounting tabs, shown here below in the case outline drawings.

15 - OUTLINE DRAWINGS

Dimensions: L 214.4/240 x W 50.8 x H 38.6 mm (L 8.44/9.47 x W 2.00 x H 1.52 in)
Volume: 420.4 cm^3 (25.65 in^3)
Weight:



All dimensions are in mm

Figure 7

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260 W Programmable Constant Current LED Driver with 0-10 V Dimming & Integrated Bluetooth® Mesh

16 - LABELING

The CDB260-1700-210 is used in figure 8 as an example to illustrate a typical label.

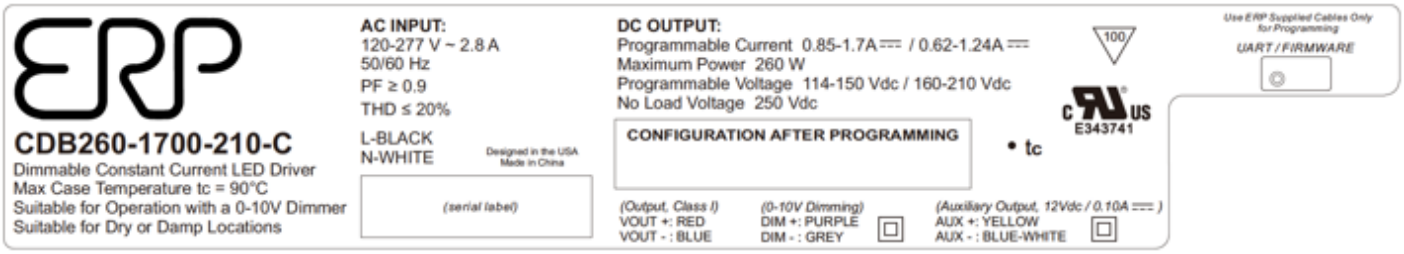


Figure 8

USA Headquarters
Tel: +1-805-517-1300
Fax: +1-805-517-1411
893 Patriot Drive, Suite E,
Moorpark, CA 93021, USA

CHINA Operations
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Fax: +86-756-6266299
No. 8 Pingdong Road 2
Zhuhai, Guangdong, China 519060

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