

# Igor® PoE Linear Device Node – Max

Model: ND60-99-T-F

Igor Linear Network and Device Nodes provide the data connectivity and power distribution architecture to create a fully functioning PoE lighting control system. The Igor Gateway software communicates bi-directionally with the Nodes to control lighting for each Space, as well as to receive signals from sensors and other devices to improve occupant comfort and optimize energy savings.

## Linear Device Nodes

Device Nodes extend the functionality and reach of the Igor solution. They allow multiple Nodes to be linked together in a daisy chain from each Network Node via typical Ethernet patch cables. Additional LED fixtures and sensors can be connected without the need for multiple cable runs back to the data closet. This results in optimal power utilization and reduces the overall installed system cost by using fewer switch ports and network switches.



# Product Specifications

Specifications subject to change without notice.

Item	Model: ND60-99-T-F	Igor PoE Linear Device Node—Max
Electrical	Igor Bus Interface	Low voltage power and data interface with auto-discovery of downstream devices for connecting multiple Igor Nodes in a daisy-chain configuration
	Input Voltage	44-57VDC
	Peak Operating Power	99W max
	Nominal Standby Power	2.0W
	Igor Bus Connections	Two unshielded female RJ45 jacks for use with CAT5e/6/6A cable to Igor Network or Device Nodes
	Node Power Monitoring	Node energy data is automatically sampled every minute and stored in the Igor Cloud Portal. Accuracy: $\pm 3\%$
	Device Type	Class 2 electrical device
LED Driver Outputs	Output Channels	Flexible configuration options for up to two (2) individual white fixtures or one (1) tunable white fixture
	Driver Design	Constant current LED driver design, programmable in 10mA increments from 100mA to 2000mA.
	Dimming	Full Range dimming control from 1% to 100% in increments as fine as 0.01%. Multiple dimming modes including Analog CCR (constant current reduction), PWM and Hybrid (CCR & PWM) mode.
	Output Voltage Range	12-48VDC
	Rated Output Power	75W per channel; 80W max total for both channels
	Protection	Short circuit and open circuit protection
	Connections	Spring cage terminals accept 16-24 AWG conductors. Luminaire LED engine circuits MUST be isolated; MUST NOT have an electrical path to Ground or to the luminaire housing. Common anode and common cathode circuit designs are not supported by this Node model's LED drivers.
Sensor I/O Connections	Power Supply	One +24VDC terminal for powering external sensors, 150mA total capacity shared between Sensor I/O and RS-485 Serial Bus connections
	Sensor Inputs	Three inputs, which can be individually configured via software, for the following signal types: Analog: 0-10VDC NPN: Dry contact PNP: 24VDC Active-Hi

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Sensor I/O Connections (Cont.)	Connections	Spring cage terminals accept 16-24 AWG conductors
USB Connection	Electrical Ratings	+5VDC / 0.5A / 2.5W
	Data Rate Supported	12Mbit/sec
	Connection	USB 2.0 Type A Female
RS-485 Serial Bus Connection	Power Supply	+24VDC, 150mA total capacity shared between RS-485 Serial Bus and Sensor I/O connections
	Communication	RS-485, Half-Duplex, 115.2Kbaud
	Characteristic Impedance	120 Ω
	Connection	Micro-Latch™ 53254 Male Pin (mating plug is part # 51065-0400)
PoE Power	Electrical Ratings	44-57 VDC / 2.0A / 99W
	Connection	JST VH-Series B2P-VH-FB-B(LF)(SN) or equivalent
Offline Mode (Control Persistence)	If network data communication is lost between the Network Node and the Igor Gateway server for a period of time >150 seconds, the Node daisy-chain (1 to 5 Nodes) will enter "Offline Mode" and the following will apply	<ul style="list-style-type: none"> <li>Configured LED driver outputs in the Node daisy-chain will update to the user-defined Offline Mode dimming level. Default 20% (adj).</li> <li>If any Nodes in the associated daisy-chain are configured for a wall control, then all lights on the daisy-chain will be dimmed via that wall control.</li> <li>If any Nodes in the associated daisy-chain are configured for a motion sensor, then on/off control of all lights in the daisy-chain will be commanded by the occupancy/vacancy status of that motion sensor.</li> </ul>
Environment	For indoor use only	
	IP Rating	IP20
	Sound Rating	Class A
	Maximum Case Temp.	85°C
	Operating Temperature	0°C to 70°C
	Operating Humidity	10% to 80% RH non-condensing
	Storage Temperature	-20°C to 85°C
Storage Humidity	5% to 95% RH non-condensing	
Safety & EMC	Safety Standards	UL 2108, CAN/CSA C22.2 No. 9 UL 1598C, CAN/CSA C22.2 No. 250.0-08, CSA B-79A UL 8750, CAN/CSA C22.2 No. 250.13 UL 2043, Suitable for Use in Air Handling Spaces (Plenum Rated)

Item	Model: ND60-99-T-F	Igor PoE Linear Device Node—Max
<b>Safety &amp; EMC (Cont.)</b>	<b>Flicker</b>	Compliance with IEEE 1789-2015 Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers. (Also see the " <a href="#">Flicker-Free LED Lighting Control</a> " description, page 4.)
	<b>EMC Emissions</b>	Compliance to EN 55015:2013
	<b>EMC Immunity</b>	Compliance to EN 61547:2009
	<b>FCC</b>	Compliance to Title 47 Part 15 Subpart B Section 15.109
	<b>EU</b>	RoHS Compliant
<b>Other</b>	<b>Dimensions Overall</b>	14.13" (359mm) Length x 1.19" (31mm) Width x 0.69" (18mm) Height
	<b>Mounting Options</b>	Enclosure design allows for multiple mounting orientations via two pairs of mounting holes at 90° angle from each other. Mounting holes are spaced 350mm apart.
	<b>Origin</b>	Made in USA

## Flicker-Free LED Lighting Control

IEEE 1789-2015 contains the IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers and essentially sets the standard for flicker-free lighting. Flicker can be caused by PWM dimming of the light source, including LEDs. Igor PoE Node LED drivers can be programmed for multiple dimming modes, including PWM dimming. Igor drivers implement their PWM dimming mode at a frequency of 1250Hz, which is within the IEEE 1789-2015 standard's "Recommended Operating Area."

Other Igor driver dimming modes include Analog CCR (Constant Current Reduction) dimming, which doesn't cause any flicker of the light source; and Hybrid dimming mode, which utilizes both Analog CCR and PWM dimming. In Hybrid mode, Analog CCR dimming is used at dimming levels >10% and PWM is used at levels <10% to offer very precise low level lighting control and smooth fade on/fade off functionality.

## Remote Mounting

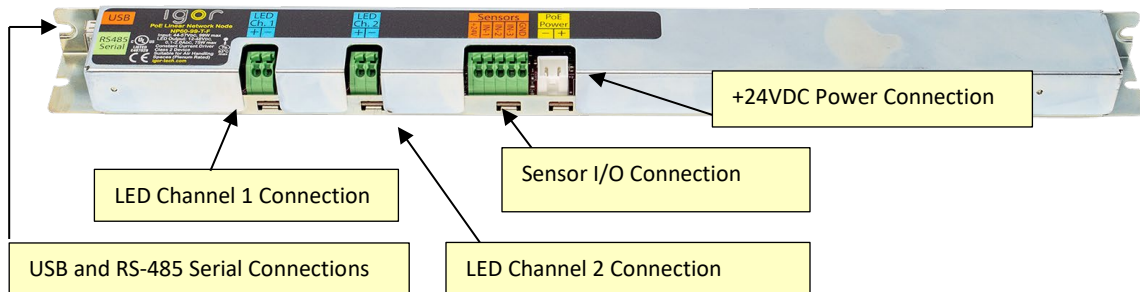
Applications that call for remote mounting of the Igor Nodes separate from the LED fixture are acceptable. Please follow the maximum wiring distances listed in Table A below when selecting an appropriate wire gauge.

		AWG Wire Size						
		12	14	16	18	20	22	
Output Current (mA)	350	900	566	356	224	141	89	Max Cable Length (ft)
	500	630	396	249	157	99	62	
	700	450	283	178	112	70	44	
	1000	315	198	125	78	49	31	
	1100	286	180	113	71	45	28	
	1400	225	141	89	56	35	22	
	1750	180	113	71	45	28	18	

**Table A.** Max cable length (ft.) between Node and LED fixture (based on 1V drop)

## Node Connections

### Linear Device Max Node Top:



### Linear Device Max Node Bottom:



END.