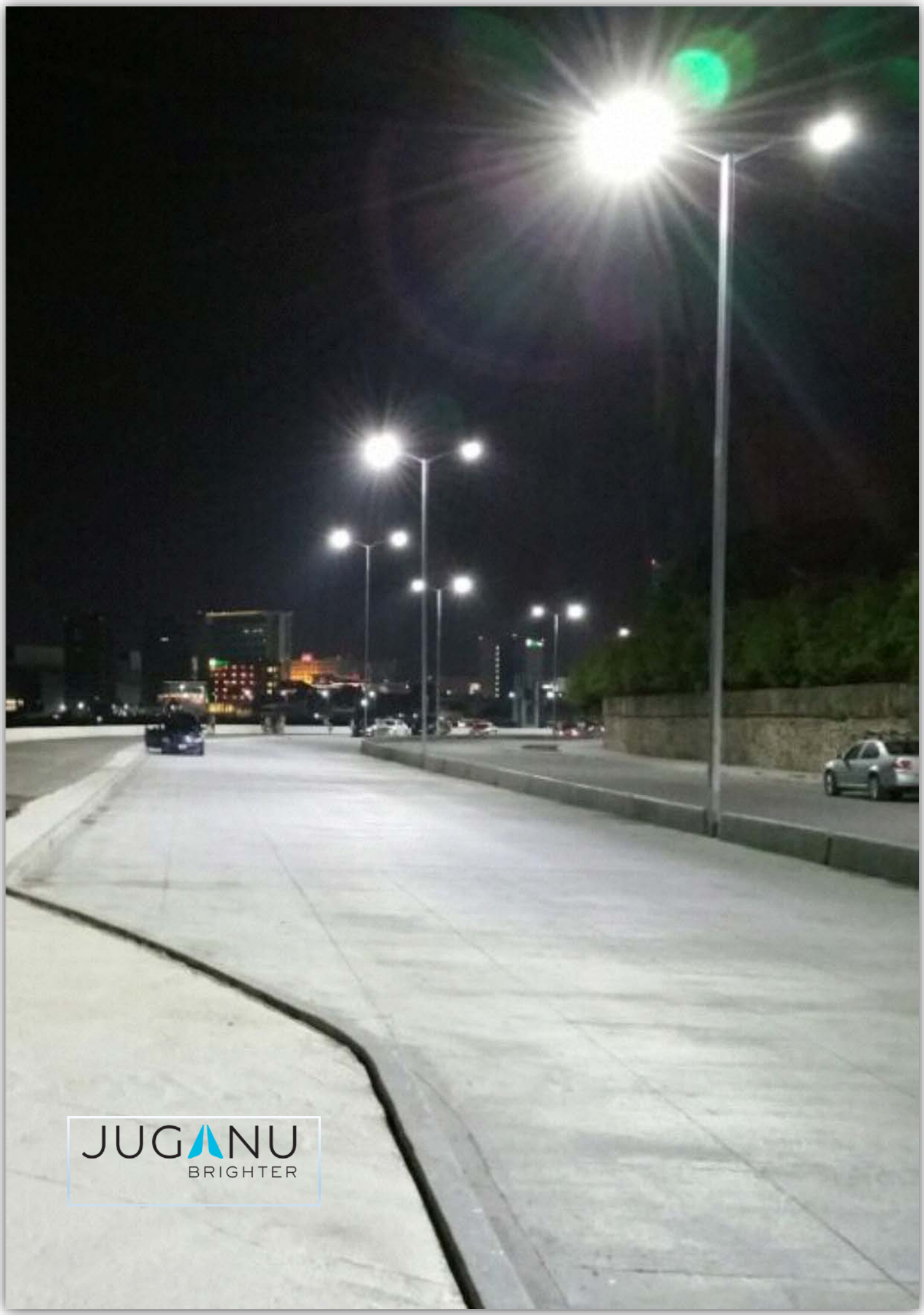

JUGANU
BRIGHTER

ORCHIS

JLED Modular Street Light

JLED ***Street & Road*** Light enables ***Smart City***

Orchis family of Modular Street & Road lights by Juganu are efficient, lightweight and reliable. High SYSTEM efficacy of 120 - 160 LPW allows significant electricity savings of 75-90%, compared to HPS and 30% and compared to other LEDs. Negligible reduction of light with time of under 1% per year allows stable lighting for many years. Optimized optics direct the light where it is needed, providing uniform illumination, while meeting the international standards for Street & Road lighting. JLED fixtures withstand severe weather conditions, such as tropical rains and proximity to the sea.

Orchis family provides infrastructure for smart city and incorporates interchangeable modules, such as sophisticated wireless communication with cloud management and control software and GPS, which allows autonomous operation, accurate power management module, AC total protection module, various sensors, video cameras, cellular microcells, Wi-Fi AP's and more. The evergreen modularity allows easy upgrade process years after the lamps are deployed.

Orchis family supports the ANSI C136.41 (7 pin NEMA) for remote management system.

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

BENEFITS

- Increase quality of life and public security
- Increase safety for drivers, riders and pedestrians
- 75-90% savings in electricity costs
- 95% saving in maintenance costs
- Infrastructure for Smart City

APPLICATIONS

- Designed to meet Street & Road luminance and illuminance requirements
- Outdoor parking areas

FEATURES

- Patent-pending "Passive Cooling" (junction temperature < 50°C)
- Modular design allows easy incorporation of various modules
- Several types of optics for various road conditions
    - Lateral distribution: Type I, II, III, IV
    - Longitudinal distribution: Very short, short, medium
- CCT (typical)
    - 3000K ÷ 6500K
- Optional Modules
    - JWLC (Juganu wireless lighting control module)
        - Wireless narrow band COM
        - Cloud-based management software
        - GPS (autonomous operation)
    - JACTP (Juganu AC total protection module) – power quality measurement and event logging
    - ANSI C136.41 (7 pin NEMA)
- Advanced optional modules:
    - JWSC1 (Medium bandwidth Juganu wireless smart city module)
        - Wireless medium bandwidth, high data-rate COM
        - Various optional sensors: pollution, meteorological data, sound, vibrations, power grid quality, occupancy, magnetic field
        - Interface to automatic meter reading system
        - GPS (autonomous operation)
        - Cloud-based management software
    - JWSC2 (High bandwidth Juganu wireless smart city module)
        - Wireless high bandwidth, very high data-rate COM
        - Various optional sensors: pollution, meteorological data, sound, vibrations, power grid quality, occupancy, magnetic field
        - Interface to automatic meter reading system
        - GPS (autonomous operation)
        - Cloud-based management software
        - Streaming video full HD camera – upto 2 cameras)
        - Public Wi-Fi access point

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

RATINGS

- Environmental: IP66 with Salt fog and UV treatment
- Temperature range: –25° to 50°C ambient
- Compliant with the material restriction requirements of RoHS
- Impact shock: IK08
- 10KVA surge protection (up to 20kVA with JACTP)
- AC input of up to 305V

MOUNTING

- Integral die cast mounting pipe stop feature
- Suitable for 1.77 ÷ 2.56 in. (45mm to 65mm) mounting pipe
- Optional accessory: Arm with 5° steps up-to ±30°

SPECIFICATIONS

- **Power consumption** | 0 to 200W (Continually dimmable)
- **Dimming** | factory set / 0 to 10V / wireless control
- **System efficacy** | up to 160 LPW (including PS & Optics)
- **Correlated Color Temperature (CCT)** | 3,000-6,500K
- **Color Rendering Index (CRI)** | > 70
- **Photometry** | IESNA type I-IV
- **Maintenance of Lumen output** | Light reduction < 1% / Year
- **Operating temperature Range** | -25 to +50 °C
    - **Main voltage** | 180 – 305 VAC (90 – 305 VAC **upon request)**
- **Frequency range** | 47 to 63 Hz
- **Surge protection** | 10KVA Protection (up to 20kVA with JACTP)
- **Lumen maintenance LM80, TM21**
    - **L90** 60,000 hours
    - **L70** 120,000 hours
- **Power factor** | > 0.92, max current THD 15% at 220V
- **MTBF** | > 900,000 hours Telcordia SR-332 (Bellcore)
- **Material** | Aluminum, PMMA, Polycarbonate with UV treatment, Silicon
- **Maintenance** | No internal cleaning required
- **Standards** (additional local standards applicable)

Group	Standard abbreviation	Description
EMC	CISPR 15,22 EM 55015; FCC part 15, 18; IEC 61000-3-2; IEC 61000-3-3; IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8	Electromagnetic
	EN61000-4-2,3,4,5,6,8,11; EN61547	10KVA surges
Photometric	EN 13032-1	Photometric

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

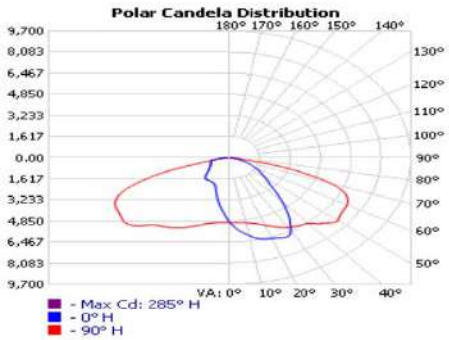
	IESNA LM-79 - 2008	Photometric
	ANSI NEMA ANSLG C78.377: 2012	Photometric
	IEC 62471:2006	Photo-biologic, exempt
Mechanics	IEC 60529, EN 60529 IEC 60598-1: 2010, Section 9 IEC 60598-1:2010 Item 9.2.7	IP66 Dust and Humidity Water Jets
	IEC-62262-2002	IK-08, Impact
	MIL-STD-810G, Method 509.5	Salt Fog
	IEC 60598-1:2010	Temp. of LED, Driver
	IEC 60598-1:2010 item 7.3	Weight/wind
	ETSI EN 300 019-2.4 IEC 68-2-6 ANSI C136.31-2010 IEC 60598-1:2010 item 4.2	Sine Vibration, Resonance Dwell Random Vibration
	Ten times the load weight of the entire lamp (including the driver's weight), the centroid thereof, for a period of 5 minutes	Vertical, Horizontal load
Safety	IEC 60598-2-3:2002 +A1:2011 EN 60598-2-3:2003 +A1:2011	Various
	IEC60598-1:2014 EN60598-1:2008 +A11:2009	
	EN61347-1, EN61347-2-13, EN62384	
	IEC 62031:2008 + A1:2012	

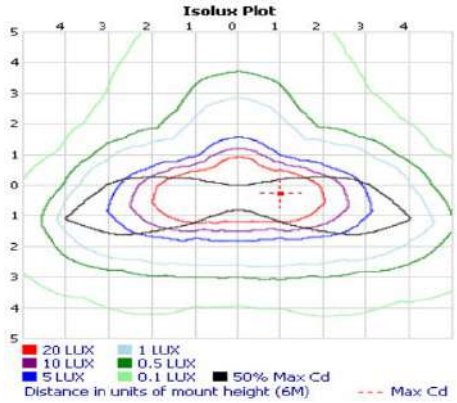
Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

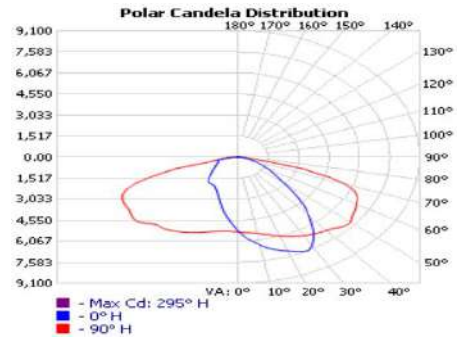
Optional photometry curves

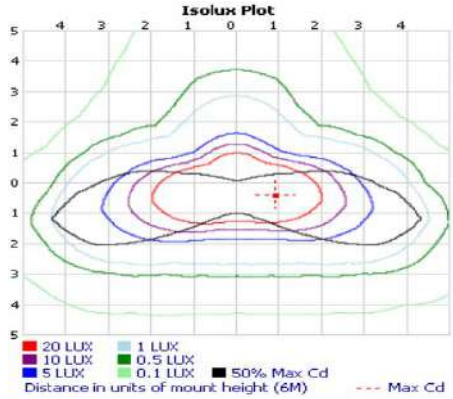
D01
Type II
Short



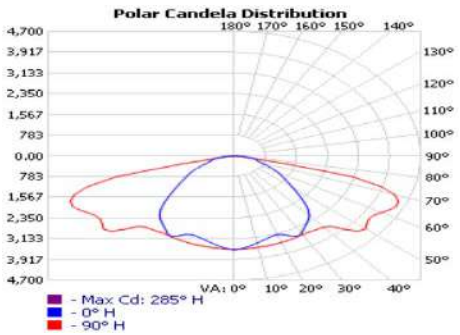


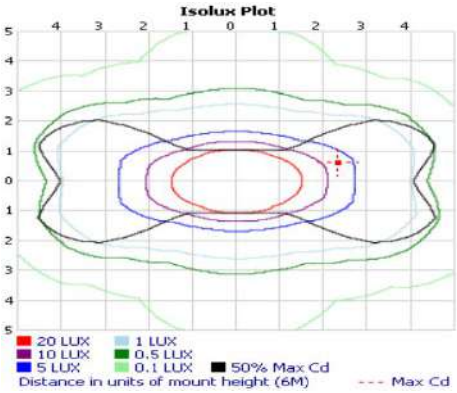
D02
Type II
Very short



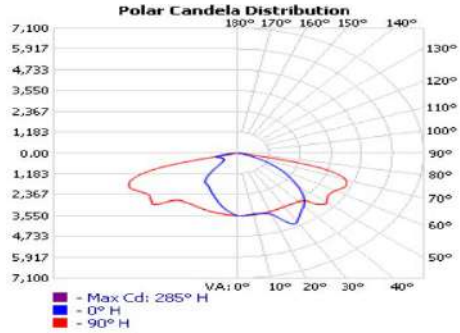


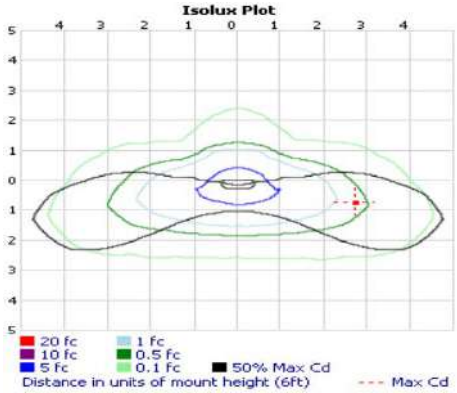
D03
Central pendant
Medium





D04
Type III
Medium



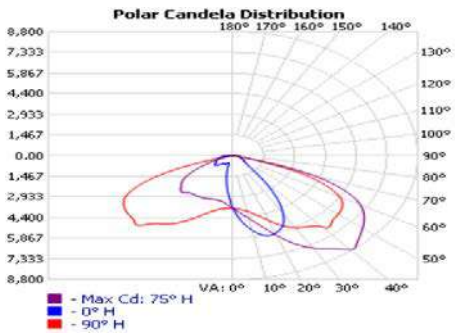


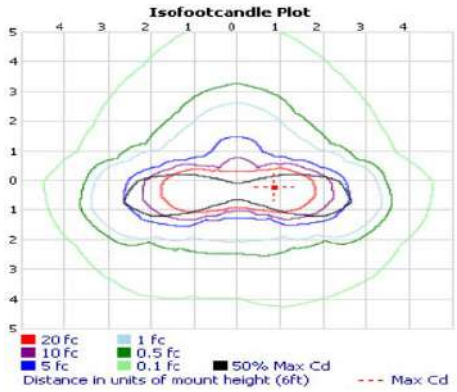
Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

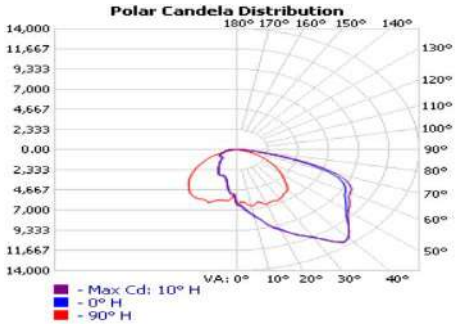
Optional photometry curves – cont.

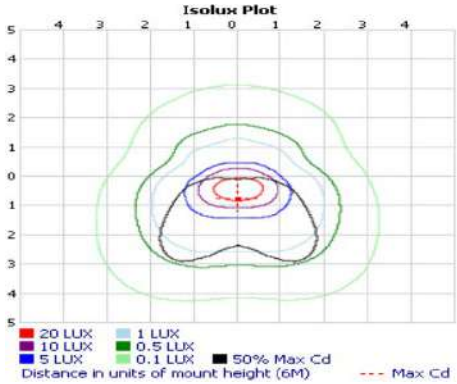
D05
Type II
Very short



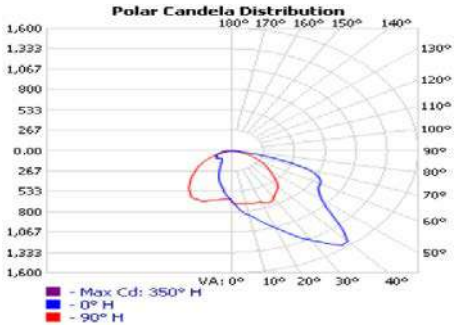


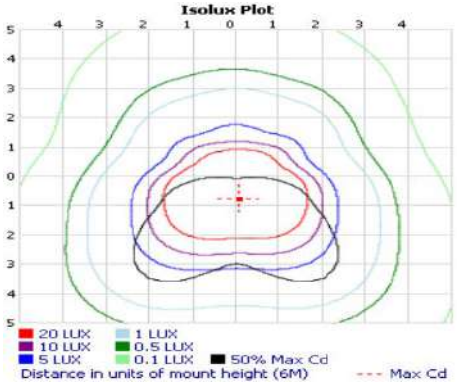
D06
Type IV
Very short



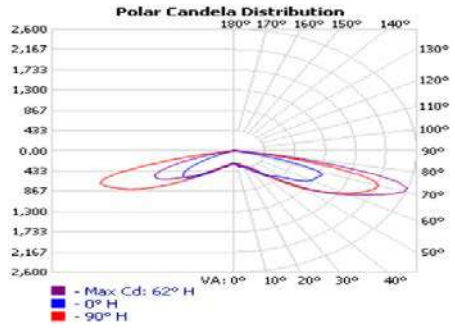


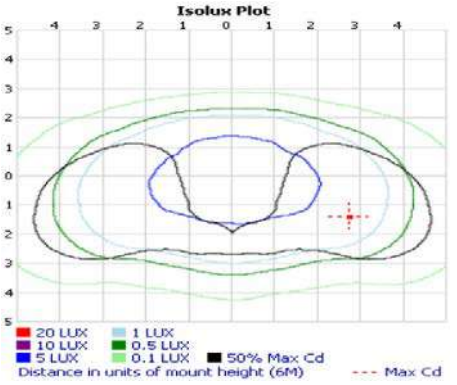
D07
Type IV
Very short





D08
Type IV
Medium



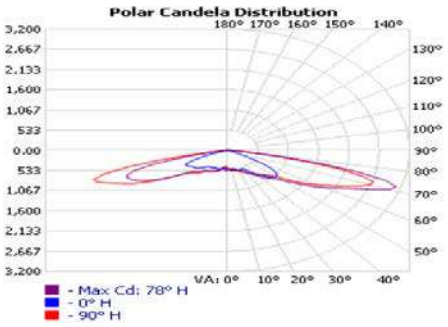


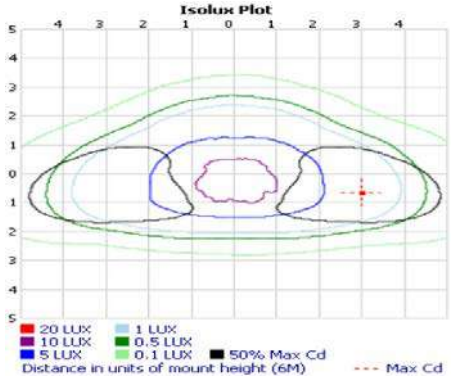
Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

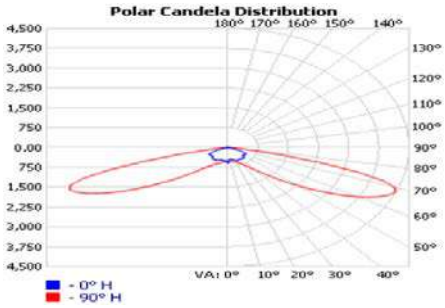
Optional photometry curves – cont.

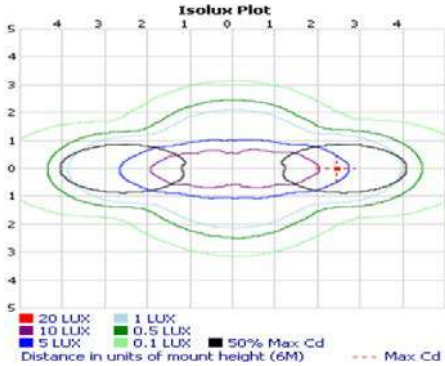
D09
Type II
Medium





D10
Type I
Medium





Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

Options of power & lumens

Power [W]	Typ. efficacy [LPW]	Total lumens [LM]
20	162	3240
30	158	4744
40	156	6240
50	153	7651
60	152	9103
70	150	10,520
80	148	11,840
90	146	13,140
100	144	14,400
120	142	17,040
150	140	21,000
175	135	23,625
200	130	26,000

Ordering information

Product ID	Power	Family	CCT	Wireless COM	ANSI C136.41 7 pin (NEMA)	AC protection unit	Distribution curve
JLED-SL	xxxW	Orchis	xx	Wx	Nx	Px	Dxx

CCT (other values possible)	**30** – 3000K	
	40 – 4000K	Standard
	50 – 5000K	
	65 – 6500K	
Wx	**W0** – Wireless controller not included	
	WL – JWLC (*LBW wireless controller*) included	Standard
	WM – JWSC1 (*MBW wireless controller*) included	
	WH – JWSC1 (*HBW wireless controller*) included	
Nx	**N0** – NEMA not included	Standard
	NS – NEMA - shorting cap	
	NP – NEMA with photocell	
	NW – NEMA with wireless COM	
	NC – NEMA with photocell and wireless COM	
Px	**P0** – Standard surge protection (10kVA) included; AC total protection module not included	Standard
	P1 – JACTP (*AC total protection module 10kVA*) included	
	P2 – JACTP (*AC total protection module* 20kVA) included	
Distribution curves	**Dxx** – see distribution curves	D05 is standard

Ordering example:

JLED-SL-060W-ORCHIS-40-WL-N0-P1-D05

Description:

JLED street light of Orchis family with 60W, 4000K, low bandwidth integrated wireless, no NEMA, with JACTP (AC total protection module 10kVA) and with distribution curve D05

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

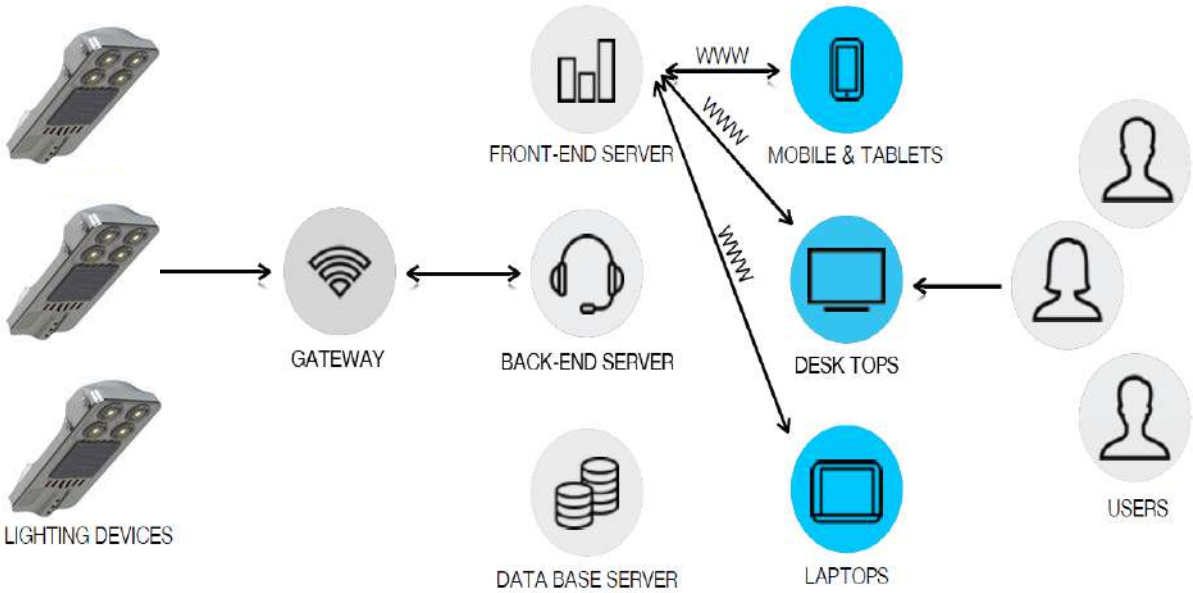
ORCHIS

JWLC (Juganu wireless lighting control module)

Integrated Wireless Communication Lighting (wireless ready) by Juganu utilizes a proprietary, patent-pending, wireless communication technology which provides full-proof, stable and secure management and control of individual fixtures and lighting arrangements, both locally and cloud-based Graphical User Interface (GUI)

- Management & Control allows both simple and sophisticated, collective or individual control of each lighting fixture
- Each luminary is presented on a customized map and allows tracking of malfunctions and maintenance activities
- The power consumption of each fixture is measured and reported Abnormal behavior is analyzed and maintenance can be predicted, planned and reported
- Any number of light fixtures are defined as group and group of groups. Each group is collectively controlled, including automatic dimming programs

BLOCK DIAGRAM



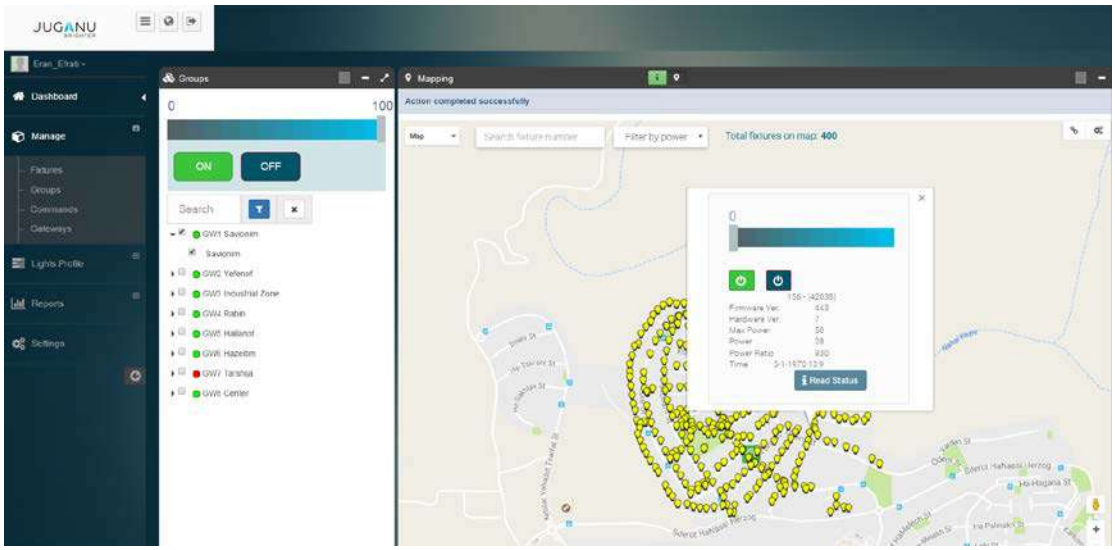
Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

CLOUD BASED MANAGEMENT SOFTWARE

Each luminary is connected to the Juganu cloud-based management system. After log-in identification process, Graphical User Interface loads very fast (on mobile device or PC) and allows for comfortable and easy management of lighting at single fixture and street/neighborhood/city levels. Each lamp or an entire city can be programmed to follow certain lighting schedules, to provide different light levels at different times. The reported power consumption is very accurate. Each lamp, which was damaged or destroyed, shows up as a RED dot on the map, allowing for cost-effective planning of maintenance.

- Cloud WEB-Based Graphical User Interface
- Accessible through PC Tablet & or Smartphone
- Clean and Easy interface
- The system requires Authorized credentials to Log in
- Control Luminary individually or in groups (street, neighborhood, city)
- Multi-level user access
- Shows the current status of Luminaries
- Shows Luminaries on Google maps
- Each Luminary is controlled at the component level
- Maintenance made easy



Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

Remote Management Systems can be conceptually described as a set of three interacting component layers:

1. Lighting controllers (potentially includes different additional services)
2. Network (COM nodes, gateways, routing and addressing logic…)
3. Management System (UI, management tools and more)

While the layers contain different types of physical devices, information is shared across all the layers. The system is established by the arrangement of controllers, which fundamentally consume and produce data, attached communication nodes and arrangement of one or more gateways. The gateways are backhauling information to and from the nodes.

Outdoor lighting system controllers typically both consume data in the form of instructions control the luminary and produce data in the form of measurements of consumption instantaneous power and energy consumption over time.

Multiple controllers typically route data through gateways, which at minimum, act as communication bridges to outside networks, but may also provide other system functions. The controllers, connected to nodes, may be accessed and managed remotely by a Management System, which typically facilitates user interaction through Graphical User Interface (GUI) and consolidates and stores retrieved data. Management Systems communicates with controllers through nodes and one or more wired/wireless backhaul connections, such as gateways.

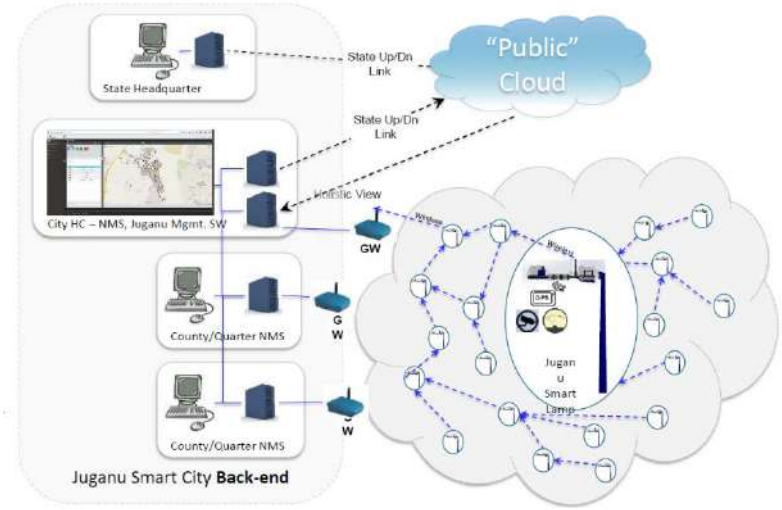


Figure 1 - Networked Outdoor Lighting Control Systems

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

System provides a means to:

- Set the frequency with which luminaires information is collected.
- Set luminaire into controlled and monitored groups.
- Manually control the state of a single light fixture or group of fixtures.
- Create schedules control, where the state of a single lamp or a group of fixtures is modified according to a predefined schedule.
- Create scheduled control programs based on the following criteria recurring:
    - Daily;
    - Weekly;
    - Weekend;
    - Special events.
    - Integrate with other systems of the Contracting Command Center, through API (Application Program interface) Web Service type.
    - Compare all collected parameters and informed by the fixtures and generate error messages in real time (based on availability of data reported) for any condition that violates the threshold specification of a particular indicator.
    - Error messages generate automatic defect tickets from the management system of the Contracting Called Operating through API (Application Program Interface) Web Service type.
    - Generate custom monitoring reports.
    - Export report data in PDF and CSV standards.
    - Generate notifications, whereby remote monitoring reports specified (predefined or custom) will be sent to the assigned users and / or groups of users via text message (SMS) and / or email.

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

JWLC (Juganu wireless lighting control module)

Wireless Communication Lighting (wireless ready) by Juganu utilizes a proprietary, patent-pending, wireless communication technology which provides full-proof, stable and secure management and control of individual fixtures and lighting arrangements, both locally and cloud-based Graphical User Interface (GUI).

Intelligent JUGANU luminaries have independence in control of its calendar, due to their unique geo-positioning system. Along with the daylight saving time (DST) added to the time zone from which it is installed, the luminaries know exactly their on and off time. Such calendar can be controlled from the JUGANU Management System and adjusted to the local needs of the client.

This fundamental advantage of Juganu smart lamps makes JUGANU the easiest to install luminary in the market, with an autonomous operation with no need for the NMS operation. The JUGANU NMS controls the lamps and receives status information from them during their operation.

The luminaries communicate over an RF network between themselves and also together with the Gateways that concentrate, control and report the status of each of the luminaries under their control to the JUGANU NMS.

This communication way of the luminaries, is divided into two essential characteristics:

- Synchronized overflow, uses all available paths between nodes (WL – JWLC)
- Routing, the pre-existing approach calculates and uses sophisticated routing algorithm to transfer information (WM – JWSC1)

The client that is controlling all the luminaries has a holistic view of each of the network elements and components from its workstation.

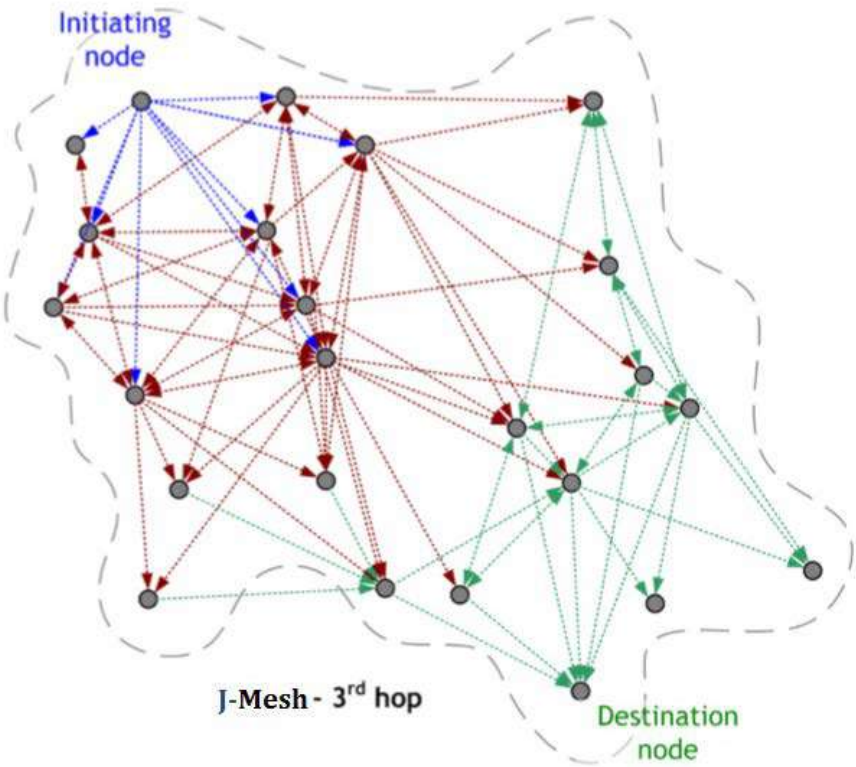
Communication network attributes:

- Support the following addressing modes: broadcast, multicast and unicast
- Support broadcasting command, such as "turn-on/turn-off" to all lights in the city, in less than 3 seconds
- Remotely SW updated over-the-air (OTA) in less than 24 hours with reliability of more than 99.95%.
- Support local access to a specific lamp, without interfering or interacting with rest of the network
- Each node shall be accessible 99.99% of time
- Each node shall be accessible 99.99% of time
- Maximum Hops number - Support up to 64 number of Hops

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

WL-JWLC

"WL-JWLC" networks use a synchronized flooding technique for transmitting the information. The initiating node broadcasts the data packets (to any node that can receive it), rather than addressing it to a specific node. Each node that receives the information retransmits it at the proper time, according to the network-timing framework. Such retransmissions occur a predetermined number of times, according to the number of hops in the specific network.



RF communication specifications:

Parameter	Value	Remarks
Frequency range	902÷928 MHz	
RF Channel spacing	256 KHz	
RF output power	+10 dBm	typical
Reception sensitivity	-103 dBm	typical
Adjacent channel rejection	27 dB	offset = 300 kHz; interferer tone not modulated
Modulation	FSK	Synchronous
FHSS frequencies	51	

- 902-928MHZ (FCC, ANATEL 915-928MHz)
- RF Information Index - 50 Kbps (US), 25 KBPS (CE)
- RF output power: 0 ÷ + 10 dBm (ULP / LP / HP)
- Synchronized transmission and frequency selection
- Antenna: Internal or External
- Fully bi-directional
- Operating temperature: -30 to 85

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

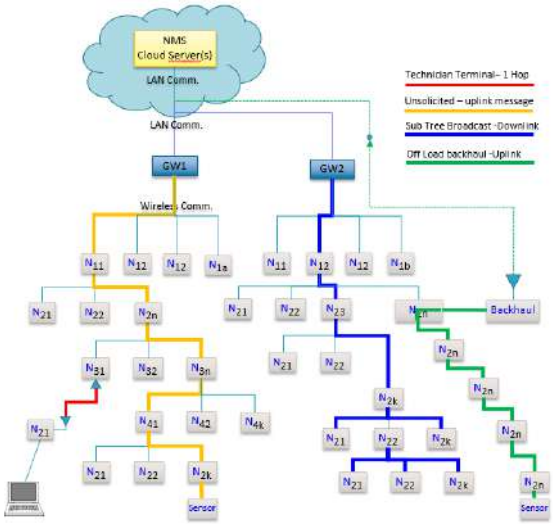
• Very short latency, to allow instantaneous lighting of lamps and quick reports
• High resistance to vehicle interference from below and nearby cellular bases
• Uses a two-way wireless MESH network for energy and cost savings
• Multiple simultaneous signal paths
• Special diversity (Time & Frequency) - no single point of failure
• High resistance in the handling of fading, obstructions and interference of multiple routes
• No transmission collisions
• Addition, extraction or transfer of instant luminaries
• Eliminates interruptions and periods of system inactivity
• Highest range, no dead spots
• Summarize the energy received at the nodes
• Up to 1km Point-2-Point for maximum redundancy
• MESH of path diversity - virtually unlimited number of propagation paths compared to only a few (usually 3) in common network types.
• MESH of path diversity - thousands of nodes per network compared to up to 255 in common network types.
• Lowest power requirement
• Transfer only load information, without routing tables or other handling information
• Synchronization saving in receiver power
• Increased performance and coverage in noisy environments

JUGANU BRIGHTER

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

WM – JWSC1

"WL-JWSC1" networks use a proprietary tree/Mesh topology routing algorithm. Extracted from the leading IoT protocols, Juganu provides a secured, robust, stable and relialbe protocol, for controlling tens of thousands of Juganu nodes. With this network having higher data bandwidth, the Juganu node can support multiple sensors and accessories, to enhance functionality and customer operation integration.



RF communication specifications: (for Brazil , 915 to 928MHz)

Parameter	Value	Remarks
Frequency range	902÷928 MHz	
RF Channel spacing	0.8 MHz	
RF output power	+14 dBm	typical
Reception sensitivity	-92 dBm	typical
Adjacent channel rejection	27 dB	offset = 300 kHz; interferer tone not modulated
Modulation	FSK	
Frequency channels	13	

- Grouping, Multicast & Sub Tree Broadcast
  - Patent pending predefined attribute based Multicast connectivity
  - Patent pending dynamic optimization of broadcast message to reduce traffic load
  - Support gathering a collection of lamps (IOT) into logical group for selective Control & Monitoring
- On Demand off Loading
  - Patent pending support an ad-Hoc Uplink back haul connection to off load traffic data
  - Provide a data shortcut from any tree location to the NMS

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

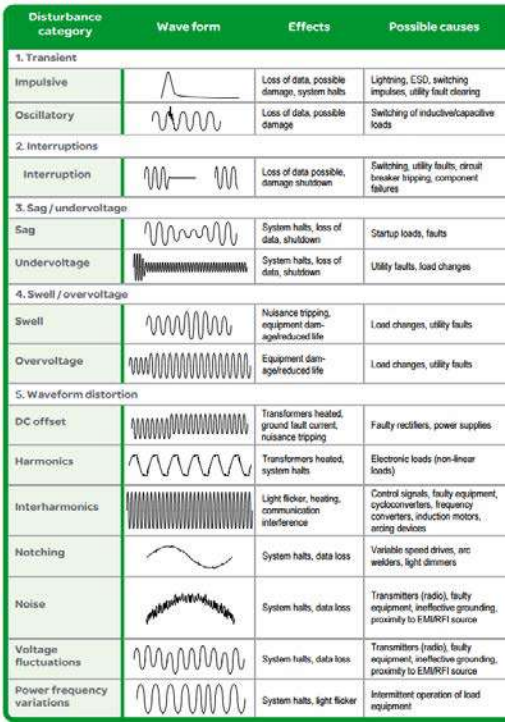
- Unsolicited uplink connectivity
  - Support truly native uplink message, initiated by the Network Node
  - Enable IOT and Smart city notifications
  - Efficient uplink routing outcome of the source routing tree nature
- Field maintenance
  - Special Ad-Hoc Technician Terminal connectivity
  - Enable field engineer to communicate with a specific, in proximity desired Node, for maintenance purpose
- Robust Security
  - Proprietary protocol & algorithms, open and standard for integration at application level

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

JACTP (Juganu AC total protection module)

The module is a Multi-functional AC system protection unit which is designed for protecting electrical power devices, including light devices from many well-known problems that may harm the devices and/or shorten their lifetime.



Disturbance category	Wave form	Effects	Possible causes
1. Transient			
Impulsive		Loss of data, possible damage, system halts	Lightning, ESD, switching impulses, utility fault clearing
Oscillatory		Loss of data, possible damage	Switching of inductive/capacitive loads
2. Interruptions			
Interruption		Loss of data possible, damage shutdown	Switching, utility faults, circuit breaker tripping, component failures
3. Sag / undervoltage			
Sag		System halts, loss of data, shutdown	Startup loads, faults
Undervoltage		System halts, loss of data, shutdown	Utility faults, load changes
4. Swell / overvoltage			
Swell		Nuisance tripping, equipment damage/reduced life	Load changes, utility faults
Overvoltage		Equipment damage/reduced life	Load changes, utility faults
5. Waveform distortion			
DC offset		Transformers heated, ground fault current, nuisance tripping	Faulty rectifiers, power supplies
Harmonics		Transformers heated, system halts	Electronic loads (non-linear loads)
Interharmonics		Light flicker, heating, communication interference	Control signals, faulty equipment, cycloconverters, frequency converters, induction motors, arcing devices
Notching		System halts, data loss	Variable speed drives, arc welders, light dimmers
Noise		System halts, data loss	Transmitters (radio), faulty equipment, ineffective grounding, proximity to EMI/RFI source
Voltage fluctuations		System halts, data loss	Transmitters (radio), faulty equipment, ineffective grounding, proximity to EMI/RFI source
Power frequency variations		System halts, light flicker	Intermittent operation of load equipment

The module consists of a combination of passive and active protection elements, analog and digital circuits that are integrated to provide state-of-the-art protection for the connected lighting fixtures.

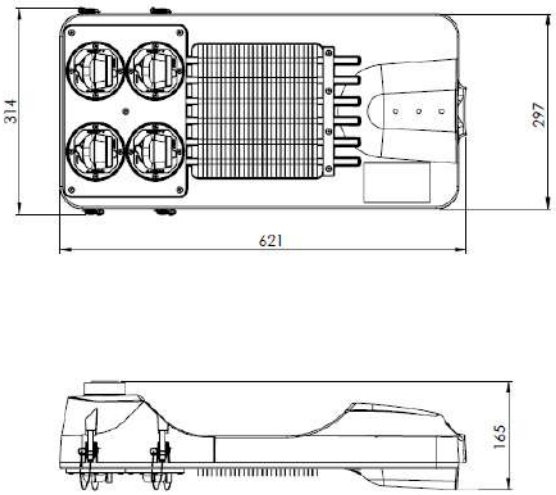
<u>The module protects the light from the following failure anomalies:</u>

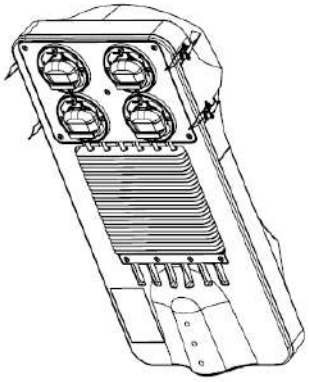
- Voltage drops, surges and transients
- Fast and slow Voltage fluctuations
- Lightning strikes
- Overvoltage, undervoltage
- Disconnection of Neutral
- AC voltage can go up to 440VAC
- Frequency variation
- Voltage imbalance
- Inrush current

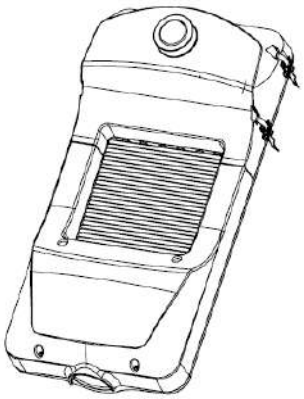
Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

Mechanical Dimensions







Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

Optional Installation accessory

Ordering number: *JLED-TASL-101*

Information provided is subject to change without notice; All values are design or typical in laboratory conditions

ORCHIS

Optional Installation accessory

Ordering number: JLED-NC-XX

XX	SC – NEMA - shorting cap	
	PC – NEMA with photocell	
	P1 – JWLC (*LBW wireless controller*)	
	P2 – JWSC1 (*MBW wireless controller*)	
	P3 – JWSC1 (*HBW wireless controller*)	
	P4 – JWLC (*LBW wireless controller*) and photocell	
	P5 – JWSC1 (*MBW wireless controller*) and photocell	
	P6 – JWSC1 (*HBW wireless controller*) and photocell	

Information provided is subject to change without notice; All values are design or typical in laboratory conditions