

Douglas Lighting Controls - Specifications

W-2000 Networked Systems

1. PART 1 - General

1.1 Overview

- 1.1.1 Provide a complete low voltage lighting control system for the building as shown on the plans and specified herein.
- 1.1.2 Lighting control system shall utilize networking technology based upon “LonWorks” and the products are to be LonMark certified to Level 3.1 or 3.3. System shall be able to operate as a stand-alone entity with option of using a web server device so that programming and viewing of status can be accomplished by any PC connected to the same LAN or via the internet.
- 1.1.3 If the system is to be integrated with a Building Management System, the Lighting Controls Manufacturer must make available LNS plug-ins for each product connected to the data line. All programming, configuration and commissioning will be by the BMS Integrator. The network transceivers will be FTT-10, designed for free topology or serial loop data line architecture.
- 1.1.4 All relay panel interiors shall be pre-assembled complete with the necessary relays, transformers and devices. Relay panel interiors are to be separate from enclosure so as to permit easy mounting, conduit installation and wire pull to enclosures. Interiors to be inserted last and connections made.

1.2 Manufacturers

- 1.2.1 All components are to be supplied by same manufacturer. Manufacturer to be a supplier of this type of equipment for over 10 years.
- 1.2.2 Low voltage control system shall be manufactured by Douglas Lighting Controls.

1.3 Prior Approval Submissions

- 1.3.1 Manufacturers wishing to submit quotations on the lighting control system must pre-qualify. Pre-qualification information must be submitted to the electrical consulting engineer not later than ten (10) working days prior to the final closing of tenders for this project.
- 1.3.2 The manufacturer must be prepared to demonstrate the equipment being proposed before the closing of tender.
- 1.3.3 Submit a one-line diagram of the proposed system configuration for review.

1.4 Instruction Manuals

- 1.4.1 Supply manuals on system components to permit ease of installation, system operation and maintenance including, but not limited to the following:
 - Lighting control system step-by-step operating instructions.
 - Relay panel schedules indicating circuits connected, inputs assigned, area controlled, panel location and panel equipment details.

2. **PART 2 - Materials**

2.1 **Relays**

2-wire HID Relay suited for all types of lighting loads: WR-6161

- 2.1.1 Lighting control relays mounted in relay panels shall be WR-6161 full load relays suitable for all types of lamp loads up to 20 Amperes. Load contacts shall be able to sustain 1500 amp fault currents for up to 20 milliseconds.
- 2.1.2 The relay shall be contained in a molded case containing both low and high voltage terminals and shall have a built-in operating lever marked ON/OFF for manual switching at the relay panel.
- 2.1.3 Switching the relay shall be accomplished with ONE signal wire and a common return. The signal wire shall be able to signal ON and OFF and shall also carry status current that indicates if the relay is ON or OFF.
- 2.1.4 UL Listing 20A : 120 & 277 VAC; CSA 20A : 120, 277 & 347 VAC

2-wire HID Relay, 2 pole, suitable for 480V applications: WR-6172

- 2.1.5 2-Pole lighting control relays mounted in relay panels shall be WR-6172 full load relays suitable for all types of lamp loads up to 20 Amperes. Load contacts shall be able to sustain 1500 amp fault currents for up to 20 milliseconds.
- 2.1.6 Switching the relay shall be accomplished with ONE signal wire and a common return. The signal wire shall be able to signal ON and OFF and shall also carry status current that indicates if the relay is ON or OFF.
- 2.1.7 The relay shall be contained in a molded case containing both low and high voltage terminals and shall have a built-in operating lever marked ON/OFF for manual switching at the relay panel.
- 2.1.8 UL Listing 20A : 120, 277 & 480 VAC; CSA 20A : 120, 277 & 347 VAC

2.2 **Pre-assembled Relay Panels: PWEx Series**

- 2.2.1 Where indicated on the drawings, provide a factory pre-assembled relay panel. The panel's enclosure shall be for surface or flush installation, with a screw-on cover or a hinged door assembly as required.
- 2.2.2 The panel shall consist of a pre-assembled interior insert; UL/CSA approved Douglas Cat No: CxxM or WxxM series with capacities for 12, 24, 36, 48 or 72 relays as required. Panel enclosure must be UL/CSA Approved.
- 2.2.3 Panel interior shall have the following pre-assembled and pre-wired:
 - Suitable divider separating class 1 and class 2 compartments.
 - Control transformer, UL/CSA approved for class 2 circuits, Douglas Cat. No. WR-4075-xxx where xxx = primary voltage.
 - Low voltage relays as required by switched circuits shown on plans or schedules.
 - Control devices as required.

2.3 Relay controls installed in relay panels

Programmable Relay Scanners: WRS-2224

- 2.3.1 When groups of relays are to be switched by master switches or time controls and it still must be possible to switch individual relays by local switches, provide programmable relay scanner WRS-2224.
- 2.3.2 Each scanner shall be solid state and have 24 relay outputs. An output shall be capable of switching the connected relay ON and OFF and sensing if the connected relay is ON or OFF.
- 2.3.3 Each programmable relay scanner shall have 5 switch inputs to accommodate group switches. Each switch input can be set with the keypad built into the scanner to switch some or all of the 24 relay outputs of the scanner. Each switch input must indicate an ON state if any of the relays in the group is ON. If all relays are OFF, then indicate an OFF state to the group switch.
- 2.3.4 The scanner shall be able to provide an optional flick warn option for each of the 5 groups. After the flick warn, the occupant has 5 minutes to prevent the local lights from switching OFF by activating the local switch.
- 2.3.5 The scanner shall provide an optional time-out option. When activated, this option will allow any relay in the system when switched on, to be timed for a 2 hour interval before being switched off. Flick warn may also be added to this option.
- 2.3.6 The programming of the scanner shall be user friendly with instructions printed on the scanner label.
- 2.3.7 The relay scanner shall accept a plug-in module, WNX-2624 Network Node. The network node shall use LonWorks technology and shall be LonMark certified (V3.1). This node shall be capable of connecting to an FTT-10A data line to communicate with other scanners in different relay panels or with other vendors using LonWorks technology.

2.4 Relay Panel Network & LonWorks Technology

Overview of Network nodes: WNX-2624 Node LonMark Certified to 3.1

- 2.4.1 Relay panels that are networked together with Douglas Scanners and Network nodes shall be able to operate as a stand-alone system or shall be able to be integrated as a part of a LonWorks Building Automation System that includes other functions of the building such as HVAC and Security. The WNX-2624 nodes shall use FTT-10 transceivers.
- 2.4.2 The network shall use LonWorks Inter-Operable technology and the network nodes attached to the relay scanners shall be LonMark certified to the Level 3.1 standard for lighting.

Stand-alone system

- 2.4.3 The stand-alone system shall not require the services of an integrator or other software specialist to program the system. No PC or extra device shall be required for setting which relays are controlled by a group switch input. It shall be possible to view and edit which relays are controlled by a switch input with indicators and buttons built into the relay control devices. The stand-alone system shall provide the following features:
- Each input can control any group of relays located throughout the system.
 - A single group of relays can be operated by more than one input.
 - When connected to an input, a pilot light switch shall indicate the state of the relay group. If any relay in the group is ON, the switch shall indicate ON. If all relays of the group are OFF, the switch shall indicate OFF.
 - Group inputs shall be able to accept signals from other devices such as time clocks, photocells or contact closures from other systems to provide automation of the lighting controls.
 - Each relay group shall be able to support the flick-warn option. After the flick warn, the occupant has 5 minutes to prevent the local lights from switching OFF by activating the local switch.
 - Each relay group shall be able to support the time-out option, which allows the occupant to activate by local switch a relay that will time-out after 2 hours. It shall be possible to enable and disable the feature with a time clock so that it is only active when needed (after hours).

2.4.4 WNS-2308 Input Module LonMark Certified 3.3

The input modules shall have 8 inputs that can be configured to accept 24VAC or diode pulse signals from switches or other devices. Functions that are supported by the inputs are ON, Off, flick warn, time out, delay off, delay on, housekeeping on and wink. Provide enough modules to accommodate the switches as shown on the drawings. The modules shall use FTT-10 transceivers and be LonMark certified to level 3.3.

2.4.5 WBC-2512 Dimming Control Module LonMark Certified 3.3

The Dimming Control Modules shall have 12 outputs and provide 0-10VDC standard control to operate incandescent dimming modules or fluorescent dimming ballasts. Provide as required from schedules as shown on the drawings. Modules shall use FTT-10 transceivers and be LonMark certified to level 3.3.

2.5 Wall Switches & Accessories

Switches - Hardwired

- 2.4.6 Remote control switches and switch hardware to mount to standard wall boxes. Standard switches mount up to 3 switches per gang.
- 2.4.7 Rocker switches shall be WR-8001.
- 2.4.8 Switches that require an indicator shall be WR-8501 push button switch. Switch shall have integral LED's that indicate both ON and OFF states (red=ON, green=OFF). The switch shall have a plastic cap to permit holding a paper identification label.
- 2.4.9 Switches that require keyed operation shall be WRK-8201 Key switch complete with integral LED to indicate state.
- 2.4.10 Wiring of switches to be #18 AWG, solid conductor. Check with manufacturer regarding other gauges before installing.

Switches - Networked

- 2.4.11 Network switches shall be WNS-2313 and have integral LED's that indicate both ON and OFF states (red=ON, green=OFF). The switch shall have a plastic cap to permit holding a paper identification label.
- 2.4.12 Switches shall have FTT-10 transceivers and be LonMark certified to level 3.3.

Switch plates

- 2.4.13 Select switch plates to suit number of switches as shown on the plans. Up to 3 switches can be installed in a 1 gang box. Use WN-3020 filler plugs where appropriate.
- 2.4.14 Switch plates are to be made of stainless steel shall be WN-76xx series cover plates.

2.5 Photocell & Daylight Controls

Outdoor and Ceiling Mount Photocell: WPS-5941 & WPS-5951 Remote Sensor LonMark 3.3

- 2.5.1 Provide where required a photometric sensor, capable of sensing from 1-6,000 foot candles. The WPS-5941/5951 sensor is to be connected to the LonWorks data line and shall output a continual light level to the system controller. Sensors to be LonMark certified to level 3.3.

Indoor Task Area Daylight Sensor for Dimmable Ballasts: WPC-5700

- 2.5.2 Provide where required an indoor daylight sensor WPC-5700 for applications that harvest daylight by regulating the electronic dimmable fluorescent ballasts. The sensor shall regulate the ballast so that when natural light is bright the lamp is dim and when natural light is dim the lamp is bright. The sensor shall be ceiling mounted and measures light reflected upward from the surface below. The sensor shall have a range setting and a set-point slider located under the front faceplate.
- 2.5.3 The sensor shall be compatible with Phillips/Advance Mark VII, Motorola Helios or any other ballast that uses the same 0-10V dimming control method. The sensor shall connect with 2 wires connected in parallel to a maximum of 50 ballasts. No other connections to the sensor are required for the dimming function.

3. PART 3 - Installation

3.1 Relay panels and conduit.

3.1.1 Ensure that conduit for line voltage wires enters panel in line voltage areas and conduit for low voltage control wires enters panel on low voltage areas. Check manufacturer's drawings for location of line and low voltage areas.

3.2 Low Voltage Wiring

3.2.1 For low voltage wiring, provide wire type as recommended by the manufacturer.

3.2.2 Adhere to manufacturer's recommendations as to maximum wire length and maximum quantity of relays per switch.

3.2.3 Data line shall be #16 twisted pair Beldin #8471 or equal.

3.3 Line Voltage Wiring

3.3.1 Use wire gauges from #12AWG to #14AWG as appropriately sized for the branch circuit.

End of Section