

PRODUCT SPECIFICATIONS DIALOG® ROOM CONTROLLER

1. GENERAL

1.1. OVERVIEW

- 1.1.1. Provide a complete stand-alone, decentralized, low voltage, digital lighting control system for classrooms, offices or defined spaces as shown on the plans and specified herein.
- 1.1.2. Lighting control system shall utilize 2-wire, non-polarized, topology free data line networking technology to provide power and data to occupancy/vacancy sensors, daylight sensors, and wall station switches.
- 1.1.3. The network shall be free topology and therefore not require a serial loop to achieve maximum network distance.
- 1.1.4. The system shall be offered in factory configured and programmed kit that includes occupancy/vacancy sensors, daylight sensors, and wall station switches.
- 1.1.5. The controller shall be installed directly onto the knockouts of a 4x4 metal junction box.
- 1.1.6. The stand-alone system shall be capable of connecting to a Douglas Lighting Controls WLC-4150 for centralized network integration and control.

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. Lighting control system shall be the Dialog system manufactured by **Douglas Lighting Controls Inc.**

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 MANUAL

- 1.4.1. Installation Guide shall be available to permit ease of installation and system operation including, but not limited to: Lighting control system step-by-step installation instructions.

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Universal Douglas – Canada Office
280-3605 Gilmore Way Burnaby, BC V5G 4X5, Canada
Phone: 877-873-2797

Universal Douglas – United States Office
51 Century Blvd. Ste 230, Nashville, TN 37214
Phone: 615-315-5100

2. MATERIALS

2.1. DIALOG ROOM CONTROLLER: WRC-4244

- 2.1.1. Where indicated on the drawings provide a pre-configured, digitally addressable, plenum-rated room controller.
- 2.1.2. The Dialog Room Controller shall be capable of:
 - Autonomously controlling a space.
 - Networking to a central Dialog control system.
 - Networking to a central BACnet based management system.
 - Interconnect multiple WRC-4222/WRC-4244/WUL-4924 in combination up to 12 Relays and Dimmer outputs for stand-alone operation.
- 2.1.3. The Dialog Room Controller shall consist of:
 - A universal voltage type (120VAC/277VAC/347VAC) power supply.
 - Four 20A rated relays complete with manual override. Circuit Load rating dependent on usage. One circuit dedicated for 20A receptacle control.
 - Four 0-10V control channels, each capable of 100mA current sinking
 - A port to connect downstream switches, occupancy sensors and daylight sensors. All downstream devices shall connected via two #18AWG, non-polarized, non-shielded, non-twisted conductors. See Section 3.4 for wiring specifications.
 - A port to connect to an upstream Dialog Lighting Control Unit.
 - A port to connect upstream to BACnet IP building management system. The Controller shall communicate using native BACnet command objects appropriate for the application.
 - An indicating LED to aid in locating the controller in a darkened ceiling space.
 - Circuit testing buttons
 - Capable of connecting with WUL-4924
 - Dataline Output 24Vac 120mA
 - US & Canada Plenum Rated
- 2.1.4. Relay Ratings
 - 20A Suitable for General Purpose Loads @ 120/277/247VAC
 - 20A Suitable for Standard Ballasts and Tungsten Loads @ 120/277VAC
 - 15A Suitable for Standard Ballasts Only @ 347VAC
 - 16A Suitable for Electronic Ballasts @ 120/277VAC
 - 0.5HP @120/277VAC
- 2.1.5. The Dialog Room Controller relays shall be connected such that 120Vac plug load(s) and 277VAC/347VAC lighting loads can be switched by a single Controller with no additional add-ons or remote modules
- 2.1.6. The Dialog Room Controller shall mount to electrical junction box via threaded ½" chase nipple. No other mounting hardware shall be required.

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2.2. DIALOG ROOM CONTROLLER: WRC-4222

- 2.2.1. Where indicated on the drawings provide a pre-configured, digitally addressable, plenum-rated room controller.
- 2.2.2. The Dialog Room Controller shall be capable of:
 - Autonomously controlling a space.
 - Networking to a central Dialog control system.
 - Networking to a central BACnet based management system.
 - Interconnect multiple WRC-4222/WRC-4244/WUL-4924 in combination up to 12 Relays and Dimmer outputs for stand-alone operation.
- 2.2.3. The Dialog Room Controller shall consist of:
 - A universal voltage type (120VAC/277VAC/347VAC) power supply.
 - Two 20A rated relays complete with manual override. Circuit Load rating dependent on usage.
 - Two 0-10V control channels, each capable of 100mA current sinking
 - A port to connect downstream switches, occupancy sensors and daylight sensors. All downstream devices shall connected via two #18AWG, non-polarized, non-shielded, non-twisted conductors. See Section 3.4 for wiring specifications.
 - A port to connect to an upstream Dialog Lighting Control Unit.
 - A port to connect upstream to BACnet IP building management system. The Controller shall communicate using native BACnet command objects appropriate for the application.
 - An indicating LED to aid in locating the controller in a darkened ceiling space.
 - Circuit testing buttons
 - Capable of connecting with WUL-4924
 - Dataline Output 24Vac 120mA
 - US & Canada Plenum Rated
- 2.2.4. Relay Ratings
 - 20A Suitable for General Purpose Loads @ 120/277/247VAC
 - 20A Suitable for Standard Ballasts and Tungsten Loads @ 120/277VAC
 - 15A Suitable for Standard Ballasts Only @ 347VAC
 - 16A Suitable for Electronic Ballasts @ 120/277VAC
 - 0.5HP @120/277VAC
- 2.2.5. The Dialog Room Controller relays shall be connected such that 120Vac plug load(s) and 277VAC/347VAC lighting loads can be switched by a single Controller with no additional add-ons or remote modules
- 2.2.6. The Dialog Room Controller shall mount to electrical junction box via threaded ½" chase nipple. No other mounting hardware shall be required.

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2.3. DIALOG ROOM CONTROLLER UL924 RELAY EXPANSION PACK: WUL-4924

- 2.3.1. Where indicated on the drawings provide a 2-relay expansion pack consisting of two independently controllable, 20A relays capable of emergency lighting circuit control.
- 2.3.2. Expansion pack relays shall force EM lights on when the Dialog Room Controller loses power.
- 2.3.3. The expansion pack shall connect to the Dialog Room Controller. No wires or tools shall be required to add an expansion pack to a Dialog Room Controller. The Dialog Room Controller will include a means for remote mounting if required.
- 2.3.4. Circuit testing buttons
- 2.3.5. The device must be UL-924 certified
- 2.3.6. Capable of connecting directly to WRC-4244 & WRC-4222

2.4. WALL SWITCH – WSW-45XX SERIES DATA LINE SWITCHES

- 2.4.1. Switches shall be **Douglas Lighting Controls** WSW-45xx and connect to the lighting control network via a common 2-wire, non-polarized data line. Switches shall be configured and programmed to control one or more outputs in the lighting control system.
- 2.4.2. Switches shall have the capability to be configured by a **Dialog 4000 Series Programmer App** for Apple iOS or Android that accesses programming fields of the switch without removing the switch from the wall box.
- 2.4.3. Switches shall have a companion app to allow for touchless control of the switch station via the **Dialog Tap-to-Control App** for Apple iOS or Android.
- 2.4.4. Switches are linked to a single output or a group of outputs.
- 2.4.5. Switches, Occupancy Sensors and Photo Sensors can be set to a common output address to permit multiple points of control for a single relay or dimming output.
- 2.4.6. Switches, Occupancy Sensors and Photo Sensors can be set to a common group address to permit multiple points of control for a group of outputs.
- 2.4.7. Each switch can be programmed for ON/OFF control of outputs, UP/DOWN control of 0-10VDC dimming ballasts, 0-10VDC LED drivers and/or preset control to set a specific lighting scene.
- 2.4.8. Each switch shall allow button configurations for a timer function.
- 2.4.9. Switches, with LED indicators to indicate both ON and OFF output/group status, shall be available with 1, 2, 4, 6, or 8 single button switches per gang.
- 2.4.10. Switches and switch hardware shall mount to standard wall boxes and fit standard Decora opening.
- 2.4.11. Default labeling provided for a simple usage and esthetics, each switch shall allow custom laser-etching, if required.
- 2.4.12. Adhere to the factory recommended wiring practices so that physical removal of any single switch shall still permit communication between relay panels in the rest of the Dialog lighting control network.

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2.5. DIMMER SWITCH: WSD-450X SERIES

- 2.5.1. Dimmer switches shall be **Douglas Lighting Controls WSW-45xx** and connect to the lighting control network via a common 2-wire, non-polarized data line. Switches shall be configured and programmed to control one or more outputs in the lighting control system.
- 2.5.2. Dimmer switches shall have the capability to be configured by a **Douglas Lighting Controls 4000 Series Programmer App** for Apple iOS or Android App that accesses programming fields of the switch without removing the switch from the wall box.
- 2.5.3. Dimmer switches shall have a companion app to allow for touchless control of the switch station via the **Dialog Tap-to-Control App** for Apple iOS or Android.
- 2.5.4. Dimmer switches, with LED indicators to indicate both ON and OFF output/group status, shall be available with 1, 2, or 4 zones of ON/OFF and Dimming per gang.
- 2.5.5. Switches and switch hardware shall mount to standard wall boxes and fit standard Decora opening.
- 2.5.6. Default labeling provided for a simple usage and esthetics, each switch shall allow custom laser-etching, if required.
- 2.5.7. Adhere to the factory recommended wiring practices so that physical removal of any single switch shall still permit communication between relay panels in the rest of the Dialog lighting control network.

2.6. CEILING OCCUPANCY/VACANCY SENSOR: LOW VOLTAGE WORXDG1-BPR-N SERIES

- 2.6.1. Sensors shall be **Dialog WORxDG1-BPR-N** series, Dual Technology with Passive Infrared (PIR) and ADI-Voice detection.
- 2.6.2. Sensors shall be network connected using #18AWG two wire providing power and data bus.
- 2.6.3. Ceiling sensors shall mount recessed in to the ceiling space.
- 2.6.4. Sensors shall have a 360 degree coverage pattern with an adjustable tilt head to maximize coverage, focus on particular areas, or provide adjustment when mounted on sloped ceilings.
- 2.6.5. Lenses shall be available in Standard, Extended, Highbay, and Aisleway.
- 2.6.6. Sensors shall provide an adjustable time out period of 12 seconds to 60 minutes.
- 2.6.7. Sensors shall include a prolong feature allowing for a delay period before unoccupied state occurs. When enabled, the lights can be in an additional lighting state before shutting off.
- 2.6.8. If a Photo Sensor is required, it shall be incorporated into the Occupancy Sensor device and shall be used for Daylight Harvesting functions.
- 2.6.9. A Form-C relay shall be provided to allow for signaling to other systems, such as an AHU.
- 2.6.10. A Manual Override Switch is to be provided on the sensor to allow the load to be manually switched ON and OFF for the purpose of testing during installation.

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2.7. WALL STATION OCCUPANCY/VACANCY SENSOR AND SWITCH: LOW VOLTAGE WOSSDG1-BP-VW

- 2.7.1. Sensors shall be **Dialog WOSSDG1-BP-VW** Dual Technology sensor with Passive Infrared (PIR) and ADI-Voice detection.
- 2.7.2. Sensors shall be network connected using #18AWG two wire providing power and data bus.
- 2.7.3. Sensors shall provide an adjustable time out period of 12 seconds to 60 minutes.
- 2.7.4. Sensors shall include a prolong feature allowing for a delay period before unoccupied state occurs. When enabled, the lights can be in an additional lighting state before shutting off.
- 2.7.5. If a Photo Sensor is required, it shall be incorporated into the Occupancy Sensor device and shall be used for Daylight Harvesting functions.
- 2.7.6. Switches and switch hardware shall mount to standard wall boxes and fit standard Decora opening.
- 2.7.7. A Manual Override Switch is to be provided on the sensor to allow the load to be manually switched ON and OFF for the purpose of testing during installation and for MANUAL ON/AUTO OFF (vacancy) applications.

2.8. WALL STATION OCCUPANCY/VACANCY SENSOR AND DIMMER: LOW VOLTAGE WOSSDG1-BDP-VW

- 2.8.1. Sensors shall be **Dialog WOSSDG1-BDP-VW** Dual Technology sensor with Passive Infrared (PIR) and ADI-Voice detection.
- 2.8.2. Sensors shall be network connected using #18AWG two wire providing power and data bus.
- 2.8.3. Sensors shall provide an adjustable time out period of 12 seconds to 60 minutes.
- 2.8.4. Sensors shall include a prolong feature allowing for a delay period before unoccupied state occurs. When enabled, the lights can be in an additional lighting state before shutting off.
- 2.8.5. If a Photo Sensor is required, it shall be incorporated into the Occupancy Sensor device and shall be used for Daylight Harvesting functions.
- 2.8.6. Switches and switch hardware shall mount to standard wall boxes and fit standard Decora opening.
- 2.8.7. A Manual Override Switch is to be provided on the sensor to allow the load to be manually switched ON and OFF for the purpose of testing during installation and for MANUAL ON/AUTO OFF (vacancy) applications.
- 2.8.8. The Dimmer version (-BDP) has a raise and lower button for dimming targets on the Dialog bus.

2.9. PHOTO SENSOR & DAYLIGHT CONTROLS: WPS-4741 INTERIOR DAYLIGHT SENSOR

- 2.9.1. Provide where required a **Douglas Lighting Controls** WPS-4741 Interior Daylight Sensor capable of sensing from 0 to 65,000 lux (0 to 6500 fc) of direct light. The sensor shall derive both its power and data information from the **Dialog** data line.
- 2.9.2. The ambient light level shall be continuously monitored in lux by the sensor. The sensor shall broadcast to the network the existing light level when requested or when there is a change in detected light level.
- 2.9.3. Set point adjustments can be made via a touch screen or web server interface to the **Douglas Lighting Controls** WLC-4150 LCU or on the WLC-4150.
- 2.9.4. Each sensor can be programmed to provide ON/OFF control of relays, raise/lower of 0-10vdc type or ballasts and LED drivers via a touch screen or web server interface to the **Douglas Lighting Controls** WLC-4150 LCU or on the WLC-4150.
- 2.9.5. One sensor shall permit different outputs to switch and/or control light levels as ambient light changes. Light levels shall be controlled by 'sensor only' or in combination with a time schedule or with a dimming switch.
- 2.9.6. It shall be possible to set a maximum light level which cannot be exceeded during Natural Daylight operations or for non-daylight controlled areas, a permanent or "tuned" light level to maximize energy savings.

3. INSTALLATION

3.1. GENERAL

- 3.1.1. Products must meet UL and CSA product regulatory requirements.
- 3.1.2. Product must be installed in a controlled environment of between 14°F to 140°F (-10°C to +60°C) and be a stationary, non-vibrating, non-corrosive atmosphere and non-condensing humidity.

3.2. DIALOG ROOM CONTROLLER WRC-42XX

- 3.2.1. Installation shall allow for electrical rough to be done before devices arrive on-site.
- 3.2.2. Room Controller shall have a lightweight chassis to allow for the device to be installed with integrated chase directly onto standard 4"x4" square metal junction boxes using existing knockouts with no additional mounting hardware.
- 3.2.3. Chase nipples with locknuts shall be integrated into the chassis for ease of installation with junction boxes.
- 3.2.4. Shall be installed with either rigid metallic conduit or flexible metallic conduit.

3.3. UL924 RELAY EXPANSION PACK WUL-4924

- 3.3.1. When installing Room Controller (WRC-42xx) with UL924 (WUL-4924) relay expansion pack, the distance between the ½" chase nipples shall be spaced to fit into two back-to-back 4"x4" square metal junction box knockouts.

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- 3.3.2. Installation shall allow for electrical rough to be done before devices arrive on-site.
- 3.3.3. Shall have a lightweight chassis to allow for the device to be installed with integrated chase nipples directly onto standard 4"x4" square metal junction boxes using existing knockouts with no additional mounting hardware.
- 3.3.4. Chase nipples with locknuts shall be integrated into the chassis for ease of installation with junction boxes.
- 3.3.5. Shall be installed with either rigid metallic conduit or flexible metallic conduit.

3.4. DAYLIGHT SENSORS – WPS-4741

- 3.4.1. Install Douglas Lighting Controls WPP-INT-* daylight sensors as per manufacturer's recommendations for closed loop control of natural daylight harvesting applications.
- 3.4.2. Adhere to manufacturer's recommendations for location, wiring and programming.

3.5. OCCUPANCY/VACANCY CEILING SENSORS

- 3.5.1. Install Douglas Lighting Controls Dialog WxRxDG1-BPR-N Occupancy/Vacancy Sensors so objects do not block the coverage area. Keep away from HVAC vents and light directly from light fixtures.
- 3.5.2. Adhere to manufacturer's recommendations for location, wiring and programming.

3.6. OCCUPANCY SENSOR – WALL MOUNT: WOSSDG1-BP-VW & WOSSDG1-BP-VW

- 3.6.1. Install Douglas Lighting Controls Dialog WOSSDG1-BP-VW & WOSSDG1-BP-VW
- 3.6.2. Occupancy Sensors shall be installed so objects do not block the coverage area. Keep away from HVAC vents and light directly from light fixtures.
- 3.6.3. Adhere to manufacturer's recommendations for location, wiring and programming.

3.7. LOW VOLTAGE WIRING

- 3.7.1. Adhere to manufacturer's recommendations as to maximum wire length.
- 3.7.2. Power and data for the lighting control network via a common low voltage 2-wire, non-polarized Dialog data line.

3.8. LINE VOLTAGE WIRING

- 3.8.1. Use #12AWG to #14AWG appropriately sized for the branch circuit.
- 3.8.2. On-device wiring directions shall be included

4. APPLICATIONS

4.1. GENERAL

- 4.1.1. Unless relevant provisions of the applicable local Energy Codes are more stringent, provide a minimum application of lighting controls as follows:

4.2. SPACE CONTROL REQUIREMENTS

- 4.2.1. Provide occupancy/vacancy sensors with Manual- or Partial-ON functionality in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate.
- 4.2.2. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling- or corner-mounted sensors and Manual-ON switches.

4.3. MULTI-LEVEL LIGHTING

- 4.3.1. Provide multi-level controls in all spaces except toilet rooms, storerooms, library stacks, or applications where variable dimming is used.

4.4. TASK LIGHTING / PLUG LOADS

- 4.4.1. Provide automatic shut off of non-essential plug loads and task lighting in all spaces except toilet rooms and storerooms. Provide Automatic-ON of plug loads whenever spaces are occupied. For spaces with multiple occupants a single shut off consistent with the overhead lighting may be used for the area.

4.5. DAY-LIT AREAS

- 4.5.1. Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:
- 4.5.2. All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of day-lit zones.
- 4.5.3. Daytime set points for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes.
- 4.5.4. Provide smooth and continuous daylight dimming for areas marked on drawings.
- 4.5.5. Proportional dimming is required for the second interior zone within X feet of the window.

5. ELECTRICAL CONNECTIONS

5.1. POWER INPUT AND CONTROL

- 5.1.1. Main Controllers shall draw control power directly from the load circuit they are intended to control. Unless otherwise specified for the particular product, all line-voltage connections are to be 10-in flying leads (from exit point) stripped to ½-in. Conductors are to be suitable for the maximum load ratings, with a minimum size of

#12AWG. Conductors are to be stranded (stripped and shifted) copper, rated for 600V and 105C, and suitable for use in air handling plenums. All line voltage connections are to be consistent with standard North American wiring practices and configured so that once the connections are made, suitable safety barriers are provided for layman access to any programming and/or low voltage (class 2) connections.

- 5.1.2. Unless otherwise specified for the particular product, wire colors of the conductors used for class 1 connections are described in the wiring diagrams below.

5.2. ETHERNET PORT FOR BACNET IP

- 5.2.1. BACnet object information for Digital Room Controller Plug Load Controller shall be available for the following objects:

Parameter	Read	Write
Load status	X	X
Demand response control*	X	X
Room occupancy status	X	
Dimmer levels	X	X
Photo Level	x	

5.3. DEMAND RESPONSE

- 5.3.1. When active maximum dim level for dimmer output is set to 60%.

5.4. PUSH BUTTONS

- 5.4.1. 4 push buttons shall be provided to manually override each relay in the controller.

5.5. LEDS

- 5.5.1. LED to indicate data line status.
5.5.2. LED to indicate Ethernet port status.

5.6. DIP SWITCHES

- 5.6.1. 8 position DIP switch shall be provided for network addressing.

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6. MECHANICAL

6.1. GENERAL

- 6.1.1. There shall be openings for conduit connections on two perpendicular sides of the main controller unit.
- 6.1.2. Emergency Relay/Expansion Pack shall have similar mounting option and shall be connected to the main controller via a 2-position connector.
- 6.1.3. Expansion Emergency pack may be mounted adjacent to or remotely from the main controller.

6.2. COLORS

- 6.2.1. Enclosure shall have the color “Molded Black” and relay test buttons “PMS2746 blue”.
- 6.2.2. Wires shall be color coded to match relay labels
- 6.2.3. Line Voltage wires shall be #12/#14 AWG stripped and tinned

7. SUBSTITUTIONS: [IF PERMITTED]

7.1. GENERAL

- 7.1.1. All proposed substitutions (clearly delineated as such) must be submitted in writing for approval by the design professional a minimum of 10 working days prior to the bid date and must be made available to all bidders. Proposed substitutes must be accompanied by a review of the specification noting compliance on a line-by-line basis.
- 7.1.2. By using pre-approved substitutions, the contractor accepts responsibility and associated costs for all required modifications to circuitry, devices, and wiring. The contractor shall provide complete engineered shop drawings (including power and control wiring) with deviations from the original design highlighted for review and approval prior to rough-in.

7.8.22