Wattstopper®

Lighting Integrator Dataline Switch

No: 24988 – 10/16 rev. 1

Installation Instructions • Instructions d'Installation • Instrucciones de Instalación

Catalog Numbers • Les Numéros de Catalogue • Números de Catálogo: HDLS1SS/HDLS2SS/HDLS4SS/HDLS8SS

Country of Origin: Made in China • Pays d'origine: Fabriqué en Chine • País de origen: Hecho en China

DESCRIPTION

There are four basic Dataline Switch configurations: the single-gang, 1-, 2- and 4-button HDLS1SS-x, HDLS2SS-x and HDLS4SS-x, respectively, and the two-gang, 8-button HDLS8SS-x.

Each switch includes bi-color LED status lights, as well as a locator light. In addition, the 2-, 4- and 8-button units accept standard 3/8" wide (9 mm) identification labels.

The -x suffix in the catalog number refers to button and switchplate color:

2 = ivory, 4 = almond, 7 = white and 9 = grey.

Any button on a Dataline Switch may be smartwired to:

- Any relay or group of relays within a single panel.
- A channel within a single panel, or the same channel throughout multiple panels.
- A Complete Control group code.
  See WinControl documentation for additional information.

These instructions cover wiring and testing of the Local Dataline and Dataline Switches, manual smartwiring of the switches, and documenting the switch and relay configuration.

If your installation is using the HCLK8SS Network Clock, HBMS8SS Building Management System Interface Module, AA-Base Automation Appliance, or Lighting Integrator Complete Control panels please refer to the documentation provided with those products for additional programming information.

Before proceeding, read the instructions on the following pages. For an overview of the entire system and the documentation forms, refer to the other sections of the Lighting Integrator Installation and Operation Manual.

If you have any questions, call Technical Support at: 800.879.8585.

HDLS4SS-x

HDLS1SS-x

HDLS2SS-x

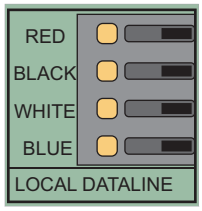
HDLS8SS-x

INSTALL THE LOCAL DATALINE

Datalines connect the relay panels, switches, and optional control modules. For simplicity, we refer to the 4-wire dataline running between a panel and the dataline switches as a "Local Dataline." Within the 4-wire dataline are two twisted pairs: the red and black wires (carrying data), and the blue and white wires (providing power to the dataline switches).

The panel provides low-voltage power to all of the dataline switches on its local dataline through the Automation Card terminals shown below.

Refer to **Lighting Integrator Interior Installation Instructions** for more information about the Automation Card.



Local Dataline connections on Automation Card: Unshielded dual twisted pair (HDLW4) both pairs used

NOTE: To ensure good communication between panels, the installer must comply with the dataline specification.
Legrand/Wattstopper will not warrant a system using a dataline that does not meet our specifications.
To avoid questions, use HDLW4(P) (plenum rated). Do not run the dataline in conduit or wiring trays with power wires. Do not connect the local datalines from two different panels.

HDLW4P Dataline Wire Specifications

- 18 AWG (7 strands x 26 AWG)
- 2 independent twisted pairs
- Unshielded copper conductors
- 2-inch twist lay on pairs, 6-inch on cable
- Plenum-rated copolymer jacket, 0.230” O.D.
- FEP 0.010” insulation, 0.060” O.D.
- 30 pF/foot maximum capacitance
- -20°C to 150°C operating temperature range
- 17 lbs. per 500 foot reel
- UL rated

REMOVE THE COVER PLATE

To remove the screwless cover plate, press in the black tab at the bottom edge of the plate and lift the plate up and off as shown in **Figure 1**. To replace the cover plate, place the hang bar at the top of the plate onto the hang hook at the top of the switch base and snap the bottom in place until it clicks as shown.

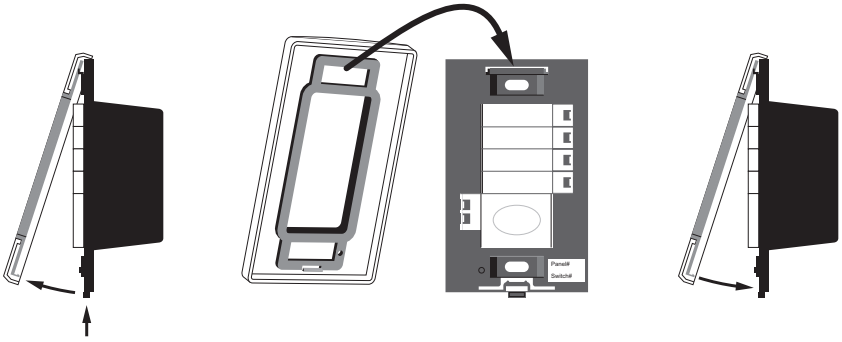


Figure 1 – Removing and Replacing the Screwless Cover Plate

INSTALL AND TEST SWITCHES

The 1-, 2- and 4-button Dataline Switches mount in standard 1-gang switch boxes. The 8-button unit mounts in a standard 2-gang box. The dataline is typically connected in a “daisy-chain” from switch to switch, eliminating expensive home runs. Consult the panel specifications and instructions for local dateline device limits. Connect the dataline red/black/white/ blue wires to the corresponding pigtails on the switch with wire nuts, as illustrated in **Figure 2**.

For proper operation, make sure the local dataline:

- Red and black wires provide a low resistance connection between all switches and the relay panel.
- Has no shorts between red and black or black to ground.
- Provides 24 VAC power to each switch.

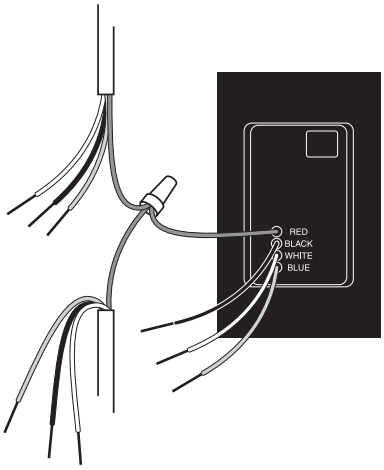


Figure 2 – Pigtail Wiring

Low-Resistance Red/Black Data Path

After wiring the last switch on the local dataline, **make sure power is OFF**. Disconnect the red and black wires from the dataline terminals in the panel and wire nut them together. Measure the resistance between the red and black terminals on the last switch (it should be less than 19 ohms). If it is higher, work backward toward the relay panel, checking the resistance at each switch. When finished, reconnect the dataline at the panel.

Shorted Dataline

After the dataline resistance test checks out, you can easily test for a shorted dataline by measuring the resistance from red to white, then black to white anywhere on the dataline. You should see an open circuit. If there is a short, start at the last switch and work backward to locate it.

24 VAC Power

The power supply in the relay panel must be on. To test for 24 VAC power at each switch, simply toggle each button on the switch **ON/OFF** after you have connected the dataline, but before mounting the switch in the electrical box. The red LED for each button should go on and off.

NUMBER AND DOCUMENT THE DATALINE SWITCHES

As shown in **Figure 3**, Dataline Switches are numbered sequentially beginning with 01-01 (Panel 01-Switch unit 01). A single switch unit may have 1, 2, 4 or 8 buttons. Switch units, and the number of buttons in each, should be identified on the reflected ceiling plan. Check to confirm that the correct switch unit has been installed at each location.

A separate **Dataline Switch Documentation** form should be used for each relay panel to record the number of the switch and its number of buttons. Allow one line for each button as shown on the form in **Figure 4**. For example, switch 01-01 has four buttons. The form should list all buttons on each switch, even if you are not using all of them.

Any switch button may be smartwired to control a single relay or a group of relays within any single panel. For example, assume that you want the top two buttons of a 4-button switch to control open office areas associated with relays in Panel 01, while the third button controls common areas (restrooms and hallways) in Panel 02. The form showshow to record this intent, and also shows the labeling for each switch button. Finally, write the switch unit number on the label in the lower right corner of the switch base as shown in **Figure 5**.

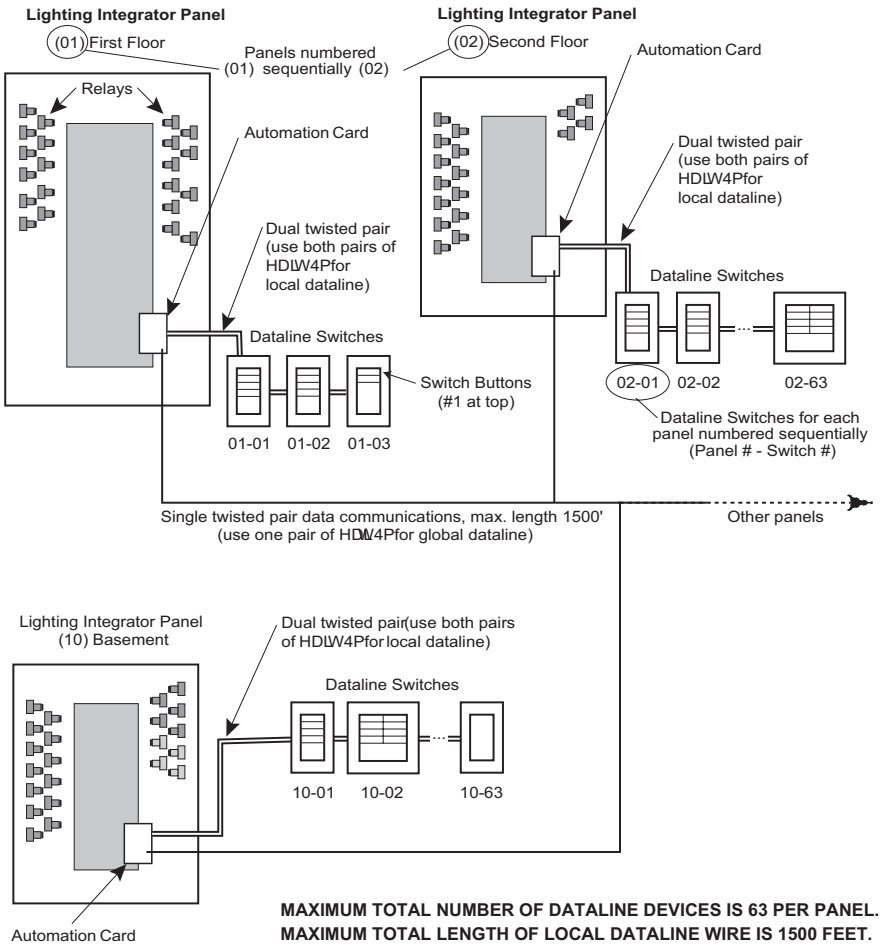
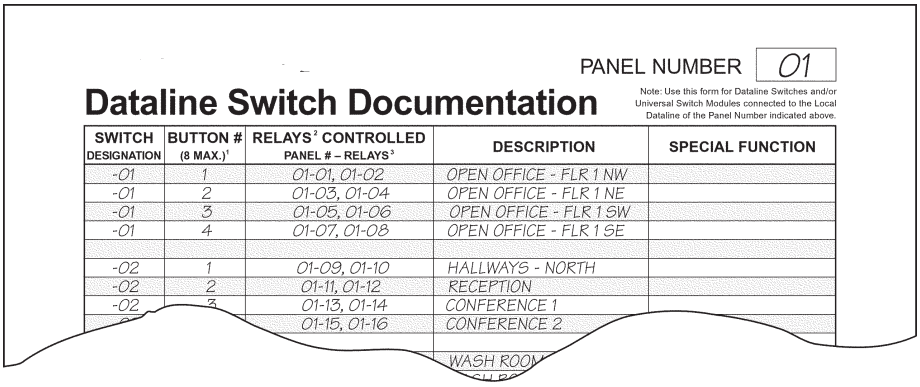


Figure 3 – Dataline Switch Numbering



PANEL NUMBER 01

Dataline Switch Documentation

Note: Use this form for Dataline Switches and/or Universal Switch Modules connected to the Local Dataline of the Panel Number indicated above.

SWITCH DESIGNATION	BUTTON # (8 MAX.)[1]	RELAYS[2] CONTROLLED PANEL # – RELAYS[3]	DESCRIPTION	SPECIAL FUNCTION
-01	1	01-01, 01-02	OPEN OFFICE - FLR 1 NW	
-01	2	01-03, 01-04	OPEN OFFICE - FLR 1 NE	
-01	3	01-05, 01-06	OPEN OFFICE - FLR 1 SW	
-01	4	01-07, 01-08	OPEN OFFICE - FLR 1 SE	
-02	1	01-09, 01-10	HALLWAYS - NORTH	
-02	2	01-11, 01-12	RECEPTION	
-02	3	01-13, 01-14	CONFERENCE 1	
[illegible]	[illegible]	01-15, 01-16	CONFERENCE 2	
			WASH ROOM	

Figure 4 – Dataline Switch Documentation Form

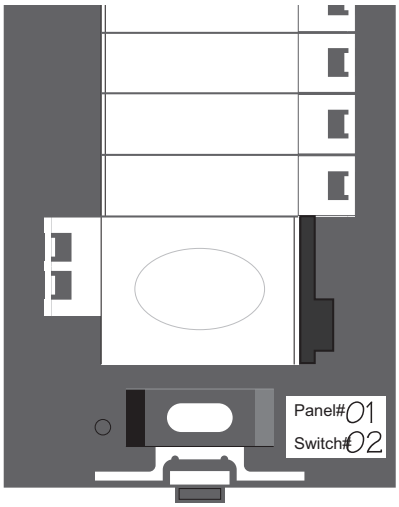


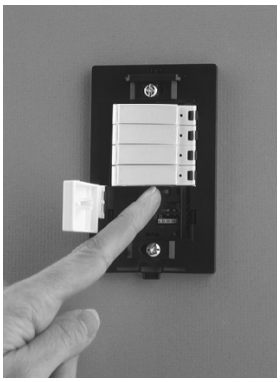
Figure 5 – Switch ID Label

MANUAL SMARTWIRING OF A DATALINE SWITCH TO A RELAY GROUP

Dataline switches are typically wired to a single relay or group of relays within a panel. Wiring to a channel provides a simple way of manually overriding all of the relays that are grouped to an automation channel (A-P) within a panel.

For systems using the AA-Base (Automation Appliance) as the primary programming and scheduling device, use only the user interface provided by the AA-Base (web browser) to smartwire the HDLS Dataline switch buttons. Manual smartwiring will be automatically overridden by the programming in the AA-Base. See the AA-Base documentation for additional information on programming HDLS Dataline switches.

When using HDLS switches with WinControl software, the Smartwire feature must be enabled in the software.



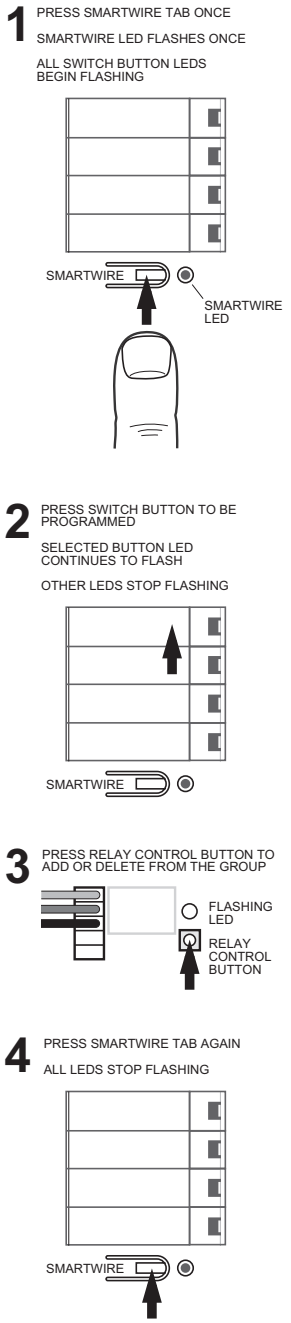
Remove the wall plate and flip open the Master button open as shown…

1. Press the SMARTWIRE tab as shown in **Figure 6**.
   The LED next to the tab will flash once, then the individual button LEDs will begin to flash **ON/OFF**.
2. Press the switch button you want to smartwire (Master button on an HDLS1SS-x).
   The LED for that button continues to flash; LEDs for the other buttons will stop flashing.
   LEDs for the relays currently controlled by that switch button will also begin to flash.

   The HCLK8SS clock/programmer, AA-BASE Automation Appliance and WinControl software can also program Dataline Switches. Refer to the corrsponding operation guide for the programming options supplied with your system.
3. Select the relays to be controlled.
   In the relay panel, press the associated relay control button to add/delete that relay to/from the group.

   To smartwire a dataline switch to a Channel, press the channel button instead of the relay control button.
4. Press the SMARTWIRE tab again.
   All LEDs will stop flashing.The selected switch button will now control the selected group of relays. Press the switch button you want to smartwire (Master button on an HDLS1SS-x). The LED for that button continues to flash; LEDs for the other buttons will stop flashing. LEDs for the relays currently controlled by that switch button will also begin to flash.

Figure 6 – Smartwiring a Dataline Switch



TEST

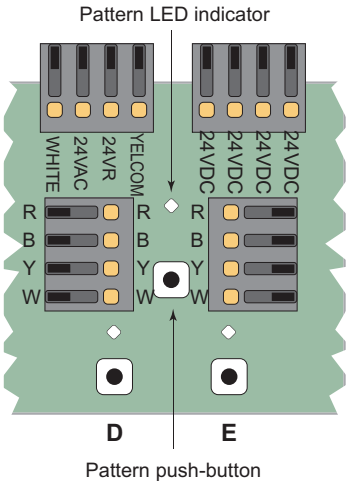
Press the selected switch button again to toggle the relay group **ON/OFF/ON**. Now press each relay control button to turn the relay **OFF**. The switch button LED will go from red (all relays on) to green (mixed group) to **OFF** when the last relay in the group is turned **OFF**.

PATTERNS OR 'SCENES'

Any dataline switch may be configured as either an **ON/OFF** Group Switch or a Pattern Switch. The Patterns mode allows the group of relays to be forced to a combination of **ON/OFF** states to provide a lighting "scene." For more information on Patterns, refer to **Special Functions**.

Smartwiring a Dataline Switch in Patterns mode is similar to the procedure described in **Figure 6**, with one additional step:

1. Press the SMARTWIRE tab.
2. Press the Switch button.
3. Press the PATTERNS button on the Group Switching card in the panel.
4. Press the relay control button to change the relay LED's status.
   Select relay status as follows:
   - **LED Red:** Relay is IN the group and turns **ON** with switch button press.
   - **LED Green:** Relay is IN the group but forced **OFF** with switch button press.
   - **LED Off:** Relay is NOT IN the group.
5. Press the SMARTWIRE tab again.



SWITCH BUTTON LABELING

Units are supplied with 2 sets of button caps. One set is solid plastic and suitable for engraving (contact the Factory for custom engraving). The second set of button caps will accept user-supplied labels.

The individual switch buttons provide space for 3/8" wide x 11/16" long (9mm x 30mm) label directories. The labels can be attached simply by removing the clear lenses, positioning the labels and replacing the lenses as shown at right.

If desired, the buttons may be completely removed from the base plate and labeled separately. You may find this method easier to achieve better alignment of the labels.

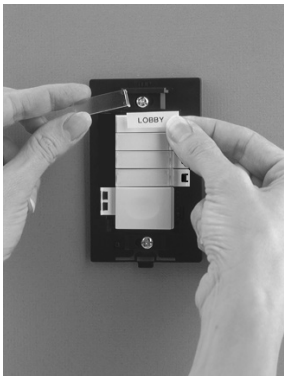
To remove a button from a 1-, 2- or 4-button switch, gently lift and rotate it around until it snaps free of the hinge bracket. To replace the button, press the hinge pin into the hinge bracket until it snaps in place.

Removing buttons from an 8-button switch is slightly different. With your small screwdriver, pry the hinge end of the button free from the hinge bracket. Lift the button out, twisting it slightly, if necessary, to free the small hook holding the center edge of the button in place. To replace the button, position the small center hook in place and press the hinge pin into the hinge bracket until it snaps in place.

Standard label makers can be used to make the 9mm directory labels. (Shown above and in the labeling examples on this page are the Brother Electronic Labeling System model PT-200 and black-on-clear label tape TZ-121.)

The screwless cover plate is easily removed by pressing the black tab on the bottom of the switch and lifting off the plate. Replace it by placing the hang bar at the top of the plate onto the hang hook at the top of the switch base and snapping the bottom in place until it clicks.

Inserting the key into the key slot and pressing the inner contact activates a keyed switch unit, allowing an authorized user to operate the switch buttons for a period of one minute. Once the key is removed, the switch cannot be activated.



The individual switch buttons on the dataline switch unit provide space for 3/8" wide x 1 1/16" long (9mm x 30mm) label directories. Standard label makers, such as the Brother PT-200, shown above, can be used to print the labels in various colors and styles.

KEYED SWITCH (OPTION)

Dataline switch units may be ordered in a keyed version (catalog numbers with -k suffix). Each keyed switch comes with a vertical opening in the lower left lightpipe where the key may be inserted, as shown to the left.

Keyed switches are used to limit manual control of lighting to authorized personnel, such as the facility manager or cleaning crew. Inserting the key and momentarily pressing the inner contact activates the switch unit, allowing authorized users to operate the switch buttons for a period of one minute. The switch unit buttons will only respond when activated by the key in this manner. At all other times, the switch will be inactive.

The following sections offer detailed instructions on assigning special functions to the dataline switch buttons for increased flexibility and alternate lighting scenarios.

SPECIAL FUNCTIONS

The Lighting Integrator system is designed to provide flexibility without compromising simplicity in installation and operation. These special functions may be used to enhance the operation of your system, but they are not required in most installations.

Patterns

A Pattern is a combination of **ON** and **OFF** states for a group of relays which creates a "scene." Any button on a dataline switch may be smartwired to create such a scene. The following example is an office with four 3-lamp fluorescent fixtures and six wall wash units (see **Figure 7**).

The local dataline switch will provide 1/3, 2/3, and Full On for the fluorescents, and separate control of the wall-wash units. The **Switch Documentation** form in **Figure 8** shows how the four buttons on a quad switch would be smartwired to create this switching function. Relays that are in an **OFF** state are circled.

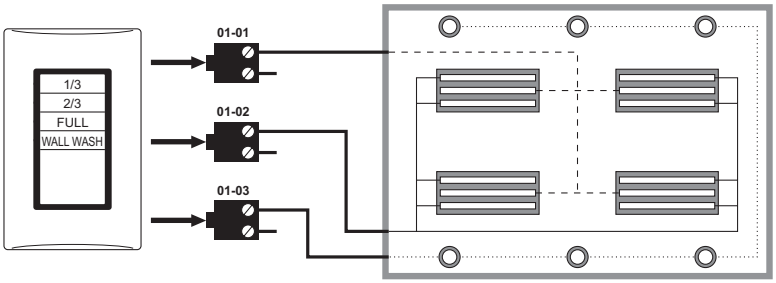
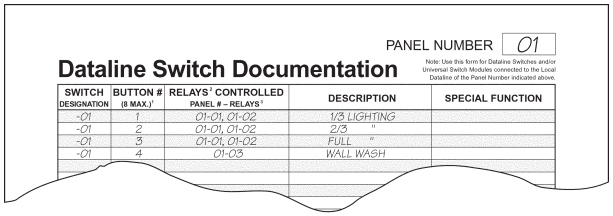


Figure 7 – Patterns Switch Lighting Layout



PANEL NUMBER 01

Dataline Switch Documentation

Note: Use this form for Dataline Switches and/or Universal Switch Modules connected to the Local Dataline of the Panel Number indicated above.

SWITCH DESIGNATION	BUTTON # (8 MAX.)[1]	RELAYS[2] CONTROLLED PANEL # – RELAYS[3]	DESCRIPTION	SPECIAL FUNCTION
-01	1	01-01, 01-02	1/3 LIGHTING	
-01	2	01-01, 01-02	2/3 "	
-01	3	01-01, 01-02	FULL "	
-01	4	01-03	WALL WASH	

Figure 8 – Patterns Switch Documentation

All of the buttons are wired as Patterns. Reviewing the switch button LED status shows why this is important (**Figure 9**). When the relay pattern for a switch button is “true”, the LED for that button will be on red. If “not true” the LED will be **OFF**.

A When the occupant presses the top button on, relay 01-01 will turn on and relay 01-02 will turn **OFF** to give 1/3 lighting. The LED for the top button will be red.

B Pressing the second button causes the relay states to reverse, giving 2/3 lighting. The top button LED turns **OFF** (since its pattern is no longer “true”) and the second button LED turns red.

C Similarly, pressing the third button turns **ON** both relays, giving full lighting. The second button LED turns **OFF** and the third button LED turns **ON**. Everything is as it should be.

If, on the other hand, the third button was smartwired as a standard **ON/OFF** group, we would have seen an odd response. Whenever buttons 1 or 2 were turned **ON**, the third button LED would be on green, showing a mixed state for its relays.

DO NOT COMBINE SCENARIOS.
USE ONLY THE DIP SWITCH
SETTINGS SHOWN IN
THIS MANUAL.

Master Button Alternate Scenarios

The Default Setting — OFF/RESTORE

The Master button on 2-, 4- and 8-button switches is pre-configured to provide an **OFF/RESTORE** scenario. If several individual switch buttons are **ON**, pressing the Master turns all of those buttons **OFF**. Pressing the Master again would turn those same buttons back **ON**.

Example 1: (Figure 10)

Assume that in the previous office example, an occupant prefers a lighting arrangement with the fluorescents at 1/3 and the wall wash units **ON**. Once the buttons on the switch are set to this combination, all the occupant needs to do in the future is press the Master button to turn **OFF** or restore this lighting combination.

Example 2:

Assume an 8-button switch is used to control eight zones in an open office space. At day’s end, all but two zones have been turned **OFF**. Upon leaving, an employee uses the Master button to turn **OFF** the remaining lighting, only to hear a shout “someone is still here”. Pressing the Master button again would restore the lighting in the zones that had been **ON**, without having to turn on the entire floor.

The operating scenario of the Master button can be changed using the first two DIP Switches located on the back of the switch unit. The DIP Switches are covered by a label to prevent accidental changes.
To change settings, remove the gray area in the upper right corner of the label on the back of the switch.

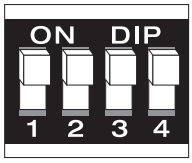


Figure 11 – DIP Switches, Default Setting

The factory default setting is all DIP Switches in the ON position.

Figure 9 – Patterns Switch Operation

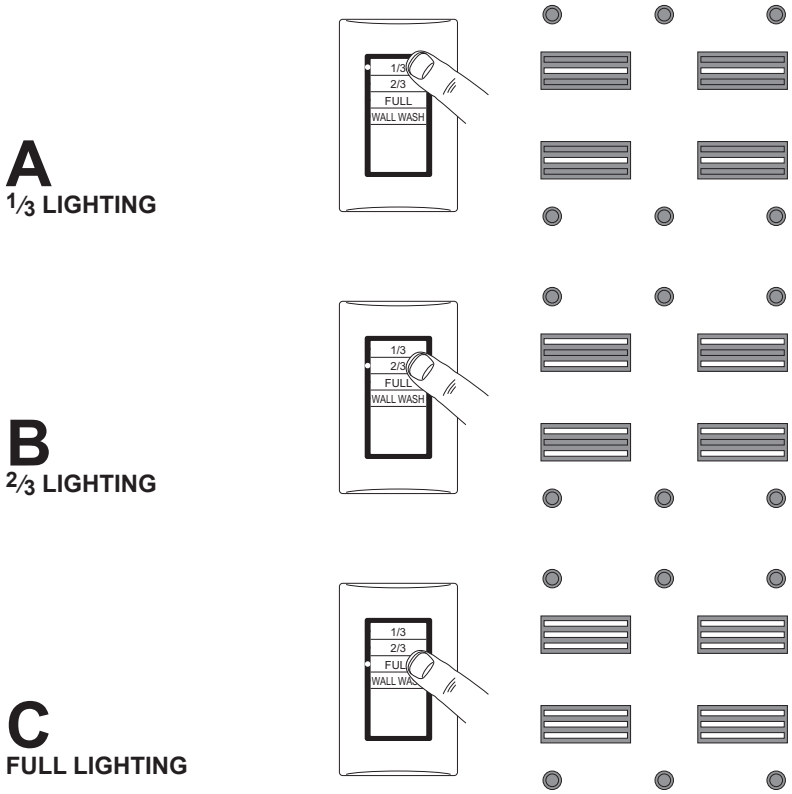
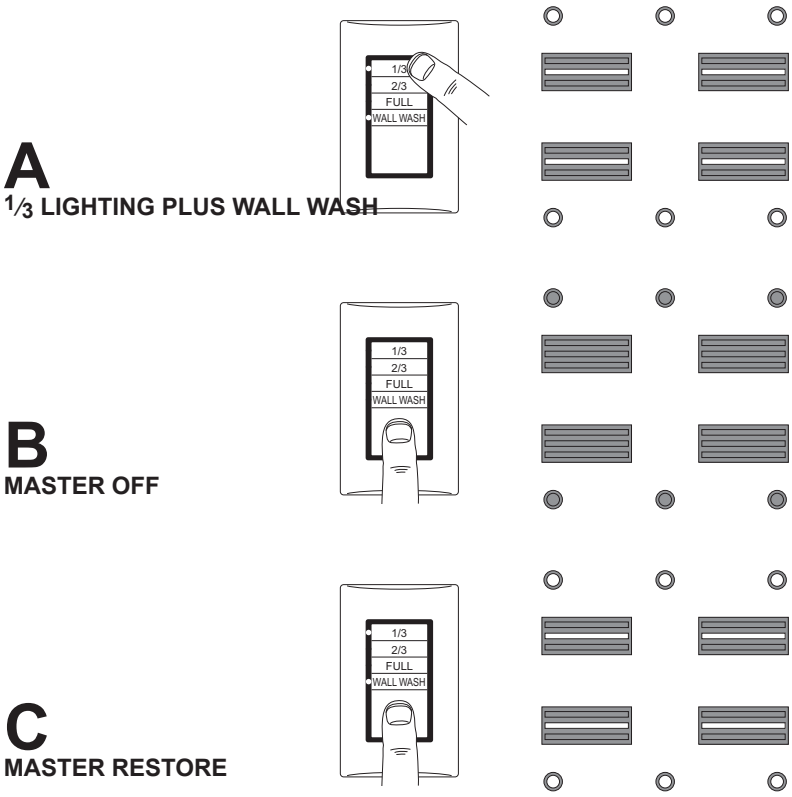


Figure 10 – Master Button Off/Restore



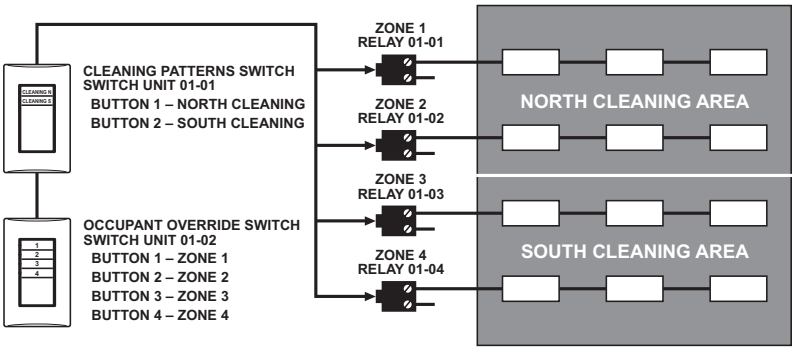
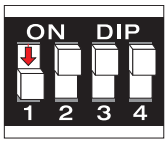


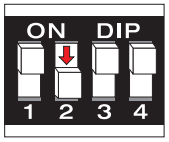
Figure 12 – Cleaning Switch Smartwiring and Lighting Layout

MASTER BUTTON ALL ON / ALL OFF



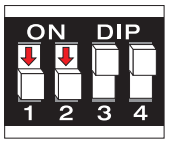
To convert the Master button to **ALL ON / ALL OFF** operation, move DIP Switch 1 to **OFF**. This operation is typically used in a prison application where there is individual control of each cell with a Master **ON/OFF** to override a bank of switches quickly.

MASTER BUTTON OFF ONLY



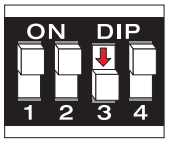
To convert the Master button to **OFF ONLY**, set DIP Switch 2 **OFF**. This is an energy-efficient setting, but not very occupant-friendly. For example, in our office application, this would make the occupant reset the desired lighting combination every morning.

MASTER BUTTON DISABLED



To disable the Master button, set DIP Switches 1 and 2 to **OFF**. This configuration may be preferred when there is concern about someone “accidentally” turning on all of the lights in an area. This scenario is also desirable when the switch is controlling both interior and exterior lighting.

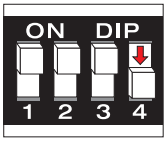
CLEANING



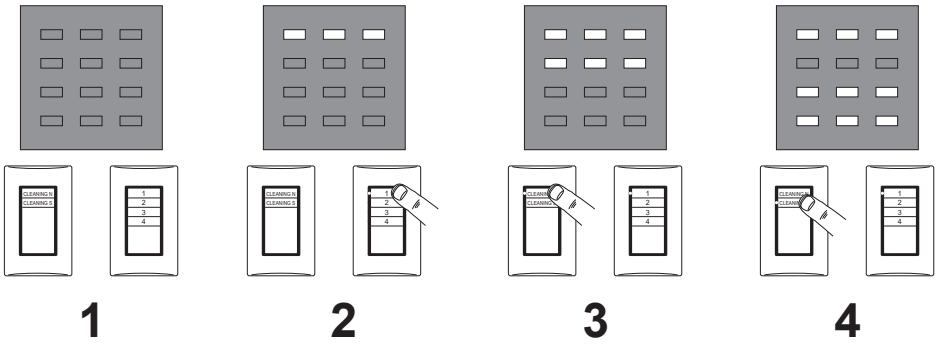
The third DIP Switch, when set in the **OFF** position as shown, changes the operation of the entire switch unit to provide a Cleaning scenario. When the Cleaning scenario is enabled, the large Master button on the switch is disabled. The intent of the cleaning scenario is to allow the cleaning staff to turn on or off a large area without negatively affecting occupants who may be staying late. When in the cleaning mode, any button on the switch unit will turn **ON** the relays smartwired to that switch button, similar to a standard switch. However, when the button is toggled **OFF**, any relays that are on because of an occupant override will remain **ON**. Combining the Cleaning scenario with Pattern operation can provide an elegant solution to control of cleaning lights (see **Figures 12 and 13**). Let’s assume that switch 01-01 has been configured as a cleaning switch with the top button (button 1) controlling a Pattern in which the North half of the floor is **ON** and South half is **OFF**. The second button does just the reverse.

With this combination, whenever the cleaners turn **ON** one half of the floor, the other half turns **OFF** automatically, saving half the lighting. Furthermore, since switch 01-01 has been configured as a cleaning switch, the cleaning crew cannot accidentally put an occupant in the dark. For instance, if an occupant has used switch 01-02 to turn on relay 01-01, as shown in step 2 below, the cleaning switch does not turn **OFF** that relay, as shown in step 4.

ON ONLY



To restrict all buttons (including the Master button) to **ON ONLY** functionality, set DIP Switch 4 to **OFF**. This scenario is typically used in schools to prevent students from turning the lighting **OFF**. When **ON ONLY** is enabled, all buttons turn lighting **ON**. Another device must be used to turn the lights **OFF**. **ON ONLY** is not available on key lock switches.



1. After hours, all lights are off.
2. A late-working occupant enters and turns on the lights in Zone 1.
3. The cleaning crew arrives and presses Button 1 on the Cleaning Switch to turn on the North Cleaning lights.
4. When finished in the North area, the cleaning crew presses Button 2 on the Cleaning Switch. The South Cleaning lights turn on and the North Cleaning lights turn off, except for Zone 1.

Figure 13 – Cleaning Scenario with Occupant Override Switch

Lighting Integrator System

Project Name ______

Panel Number ______

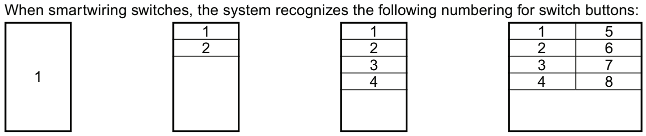
Dataline Switch Documentation

Note: Use this form for Dataline Switches and/or Universal Switch Modules connected to the Local Dataline of the Panel Number indicated above.

SWITCH DESIGNATION	BUTTON # (8 MAX.)[1]	RELAYS[2] CONTROLLED PANEL # - RELAYS[3]	DESCRIPTION	SPECIAL FUNCTION

NOTES:

1 When smartwiring switches, the system recognizes the following numbering for switch buttons:



2 In addition to controlling a group of relays, a Switch Button can also control the same Channel (Example: 01-A, 02-A would control Channel A in Panels 01 and 02)

3 When documenting a Pattern Switch, CIRCLE the relays that are in the group and are OFF.

Lighting Control Panels
Technical Support: 800.879.8585

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