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# Programming Guide

Version 2.0

## AIRWAVE PROGRAMMING GUIDE

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## AIRWAVE PROGRAMMING GUIDE

### 1.0 Linking/Unlinking an Airwave Switch or Photosensor to a Transceiver

There are two methods to link an Airwave Switch and/or photosensor to an Airwave Transceiver. One is to use the push buttons on the Transceiver to activate Link mode and link a device and the second is to link by using the wireless Switch only.

*NOTE: The maximum number of wireless devices that can be linked to any one Transceiver is 30. This can be comprised of 30 Switches and occupancy sensors or 1 photosensor and 29 Switches and occupancy sensors.*

#### 1.1 Linking using push buttons on the Airwave Transceiver

##### 1.1.1 To Link an Airwave Switch:

- Step 1: Apply power to Transceiver.*
- Step 2: Press the Link button on the Transceiver for one second and release (Link LED will turn ON).*
- Step 3: Click the Airwave Switch 3 times (ON 3 times or OFF 3 times) rapidly (Power LED on the Transceiver will remain ON for 4 seconds).*
- Step 4: Wait 4 seconds.*
- Step 5: Press the Link button on the Transceiver for one second and release (Link LED will turn off).*
- Step 6: Repeat steps 3 and 4 for as many Switches that need to be linked to the one Transceiver.*

##### 1.1.2 To Link an Airwave Photosensor:

- Step 1: Apply power to Transceiver.*
- Step 2: Press the Link button on the Transceiver for one second and release (Link LED will turn ON).*
- Step 3: Press the Photosensor button once (Power LED on Transceiver will remain ON for 4 seconds).*
- Step 4: Wait 4 seconds.*
- Step 5: Press the Link button on the Transceiver for one second and release (Link LED will turn off).*

#### 1.2 Linking Wirelessly

##### 1.2.1 Linking using an Airwave wireless Switch to a new or cleared Transceiver

- Step 1: Apply power to Transceiver.*
- Step 2: Click the appropriate Switch 3 times ON, then 3 times off, then 3 times ON rapidly.*

*NOTE: This process is used for new or cleared Transceivers only. The Switch will link to all Transceivers that are powered and within range that are not currently linked to any Airwave Switches. Transceivers that are unintentionally linked during this step can be un-linked remotely by entering the configuration mode and selecting Clear (see Programming Guide).*

##### 1.2.2 Linking an additional Airwave Wireless Switch, Photo sensor or Occupancy Sensor to a Transceiver

An existing linked Switch will need to be used to enter the configuration mode to link other devices remotely (see Section 18.4 for instructions).

## 1.3 Unlinking Devices

To unlink a device, repeat the Link steps for that device.

## 2.0 Linking/Unlinking an Occupancy Sensor to a Transceiver

### 2.1 Linking Wired 24Vdc Occupancy Sensors

Wired 24Vdc occupancy sensors can be wired directly to an Airwave Transceiver. The occupancy status can then be used by that Transceiver to control the connected light fixtures and can also be wirelessly transmitted to other Transceivers within range (see Occupancy Wiring Diagram in Appendix B).

*Step 1: Connect 24Vdc (red), Common (black), and Occupancy Trigger (yellow) wires to appropriate occupancy sensor wires/contacts.*

*Step 2: Apply power to Transceiver.*

*Step 3: The first occupancy trigger will automatically set the Transceiver to occupancy mode.*

*Step 4: To link remote Transceivers, please see Section 18.8.*

*Step 5: Set the occupancy sensor timer on the wired occupancy sensor per instructions on the sensor. The Transceiver timer is factory set to trip 30 seconds after the wired occupancy sensor has timed out. The Transceiver timer is not user adjustable for wired sensors.*

*After linking is complete, the LED will blink in a pattern depending on what types of devices are linked to the Transceiver (see Section 16).*

### 2.2 Unlinking Wired 24Vdc Occupancy Sensors

To unlink a wired occupancy sensor, disconnect the occupancy wires. Clear all devices using the instructions in Section 18.4. Re-link desired devices.

### 2.3 Linking Wireless Occupancy Sensors

To Link an Airwave Occupancy Sensor:

*Step 1: Apply power to Transceiver.*

*Step 2: Press the Link button on the Transceiver for one second and release (Link LED will turn ON).*

*Step 3: Press the Occupancy Sensor button once (Power LED on Transceiver will remain ON for 4 seconds).*

*Step 4: Wait 4 seconds.*

*Step 5: Press the Link button on the Transceiver for one second and release (Link LED will turn off).*

### 2.4 Unlinking Wireless Occupancy Sensors

To unlink an Airwave Occupancy Sensor, repeat the Link steps.

## 3.0 Clearing Devices from a Transceiver

There are two different methods to clear a Switch and/or Photosensor from a Transceiver. One is to use the push buttons on the Transceiver and the second is to clear using the wireless Switch.

### 3.1 Clearing using Push Buttons on the Airwave Transceiver

*Step 1: Apply power to Transceiver.*

*Step 2: Press and hold the Clear button until the Link LED turns ON (approximately 3 seconds). The Power LED will blink steadily.*

*NOTE: This method will clear all devices at once.*

### 3.2 Clearing using an Airwave Wireless Switch only

*See Section 17 for entering configuration mode and Section 18.7 for instructions on clearing a Switch.*

## 4.0 Understanding LED Blink Patterns

After linking is complete, the Power LED will blink in a pattern depending on what types of devices are linked to the Transceiver:

Power LED	Action/Device Linked
# of Blinks	Device linked
1	Wireless Switch (one or more)
2	Occupancy sensor (wired or wireless)
3	Wireless Photosensor (one)
4	Demand Response Transmitter

## 5.0 Transceiver Configuration Instructions

### 5.1 Understanding and Navigating in Configuration Mode

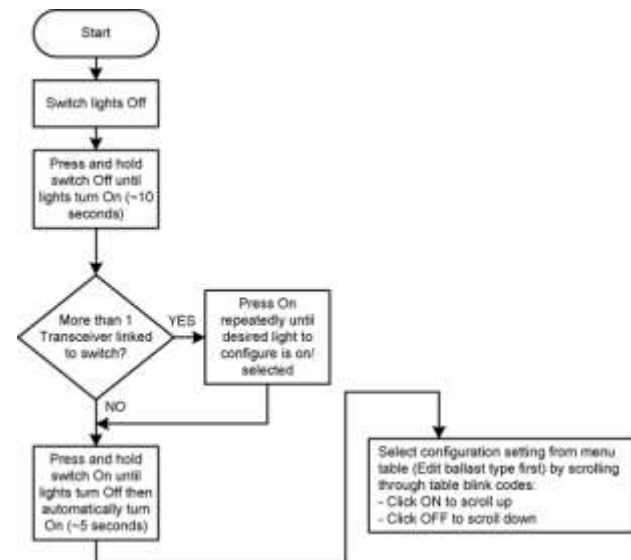
Table A below outlines the Configuration Menu through which the settings of the transceiver can be adjusted and devices can be linked or unlinked.

When using configuration mode note the following important points:

- Configuration of a Transceiver requires an Airwave Switch to be linked to the Airwave Transceiver.
- The Transceiver must be connected to a lamped light fixture.
- The configuration settings will be indicated by the number of blinks on the Transceiver's light fixture/circuit.
- Configure the ballast type FIRST to ensure the blink codes will be visible (in dimming ballast mode, the Transceiver uses dimming to display the codes instead of ON/OFF blinking).
- Clicking the Switch ON/OFF will navigate you up/down the configuration table.
- To select a configuration mode to edit, press and hold the Switch ON for approximately 3 seconds until the light fixture/circuit Switches and stops the prior blinking sequence.
- Make edits to the configuration by clicking ON or OFF to the appropriate setting.
- Press and hold the Switch ON for approximately 3 seconds to temporarily save the configuration setting and return to the configuration table.

### 5.2 Steps to Enter Configuration Mode

- Step 1: Turn the light fixtures OFF using Airwave Switch.*
- Step 2: Press and hold the Switch OFF until the light fixtures turn ON (approximately 10 seconds). This indicates that the Airwave Transceiver is now in configuration mode.*
- Step 3: Select a Transceiver to configure:*
- 3.1 Selecting a single Transceiver linked to a Switch: Press and hold the Switch ON for approximately 5 seconds until the Transceiver light fixture turns OFF then turns ON again automatically.*
  - 3.2 Selecting one of multiple Transceivers linked to a Switch: Click the Switch ON to cycle through the linked Transceivers until the fixture you want to configure turns ON. Pressing Off in this stage will exit configuration mode.*
- Step 4: Press and hold the Switch ON for approximately 5 seconds until the Transceiver light fixture/circuit turns OFF then turns ON again automatically.*



## 5.3 Steps to Exit Configuration Mode/Menu

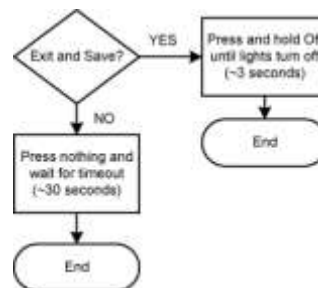
There are two options for exiting configuration mode:

*To Save the settings and Exit:*

*Press and hold the Switch OFF for approximately 3 seconds until the Transceiver light fixture/circuit turns OFF.*

*To Exit without saving settings:*

*Without pressing the Switch, wait approximately 30 seconds until the Transceiver times-out' and the light fixture/circuit turns OFF.*



**Table A – Configuration Menu** (also see Appendix A for simplified configuration mode settings).

Blink Code	Setting Description	Factory Default	Configuration Detail	Reference Guide
0 (no blink)	Ballast Type (dimming/non-dimming)	Dimming ballast	ON: Dimming ballast OFF: Non-dimming ballast	Refer to Section 18. 0
1	Timeout	15 minutes for Wireless Occupancy mode; Infinitely ON for non-occupancy mode; (30 seconds non-adjustable for wired occupancy sensors)	See following Timeout Settings Table	Refer to Section 18. 1
2	Photosensor Set Point	92 lux for dimming ballast closed loop; 450 lux for non-dimming ballast threshold Switch	See following Photosensor Set Point instructions	Refer to Section 18. 2
3	Walk Test	N/A	See following Walk Test instructions	Refer to Section 18. 3
4	Link Mode	N/A	See following Link Mode instructions	Refer to Section 18. 4
5	Repeater (ON/OFF)	OFF	ON/full bright: Enabled OFF/min.dim: Disabled	Refer to Section 18. 5
6	Occupancy ON Mode (Auto-ON/Manual-ON)	Auto On	ON/full bright: Auto On OFF/min.dim: Manual On	Refer to Section 18. 6
7	Clear	N/A	See following Clear Mode instructions	Refer to Section 18. 7
8	Occupancy Transmit (ON/OFF)	OFF	ON/full bright: Enabled OFF/min.dim: Disabled See following Occupancy Transmit instructions for linking remote Transceivers for occupancy	Refer to Section 18. 8
9	Demand Response (ON/OFF)	ON	ON/full bright: Enabled OFF/min.dim: Disabled	Refer to Section 18. 9
10	Demand Response – Moderate	Dimming ballast: 75% power draw Non-dimming ballast: No change	See following Demand Response Instructions	Refer to Section 18. 10
11	Demand Response – High	Dimming ballast: 50% power draw Non-dimming ballast: OFF	See following Demand Response Instructions	Refer to Section 18. 11
12	Demand Response – Special	Dimming ballast: 25% power draw Non-dimming ballast: OFF	See following Demand Response Instructions	Refer to Section 18. 12

## 6.0 Configuration Mode – Detailed Instructions

This section provides detailed instructions on each of the configuration modes described in Table A – Configuration Menu.

*NOTE: The first item in the menu – Blink Code 0 – is factory preset for fixtures with dimming ballast installed. However, Airwave devices also support non-dimming fixtures and some functionality will behave differently if the lighting zone is non-dimming. To set the transceiver for non-dimming functionality from within configuration mode:*

- Step 1: Enter edit mode by pressing and holding the switch ON for at least 3 seconds.*
- Step 2: Click down/off to reset the transceiver to non-dimming functionality.*
- Step 3: Press and hold ON for at least 3 seconds to exit edit mode.*

### 6.1 Blink Code 1: Timeout Settings Table

The factory default for this setting is 15 minutes for wireless occupancy mode and infinitely ON for non-occupancy mode. Wired occupancy sensors have a factory timeout setting in the Transceiver of 30 seconds that cannot be adjusted.

The factory presets should not require change. However, if the user requires a different setting:

- Step 1: Enter edit mode by pressing and holding ON until lights stop blink code 1 (approximately 3 seconds).*
- Step 2: The lights will now display the Timeout Setting Blink Code. Click on/up and off/down to select the desired timeout setting.*
- Step 3: Press and hold ON for at least 3 seconds to exit edit mode.*

Timeout Setting and Blink Code	Occupancy Mode Time Delay (for Wireless Occupancy Sensors Only)	Timed Switch Mode Delay (non-occupancy mode)
0 (lamp off or min.dim)	30 seconds	Infinite
1	5 minutes	15 minutes
2	10 minutes	30 minutes
3	15 minutes	45 minutes
4	20 minutes	60 minutes
5	25 minutes	75 minutes

## 6.2 Blink Code 2: Photosensor Set Point

The Photosensor set point mode is activated immediately upon entering the Photosensor mode. The Transceiver will record the last Photosensor measurement level received before exiting and save it as the new set point. To keep the factory settings and exit the Photosensor set point mode without saving, simply wait and allow the configuration mode to timeout.

### 6.2.1 For dimming ballasts:

*Step 1: Adjust the dimming level of the light fixture/lighting zone (using quick clicks ON/OFF instead of click and hold) to the target light level you want to maintain in the photosensor zone.*

*Step 2: Wait 10 seconds for the Photosensor to measure and transmit the level to the Transceiver.*

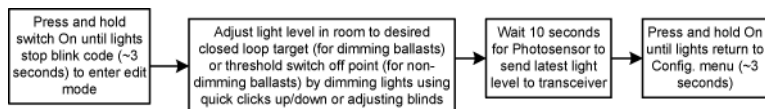
*Step 3: Exit and save the setting.*

### 6.2.2 For non-dimming ballasts:

*Step 1: Adjust the light level of the daylight in the room via blinds or wait for the appropriate daylight level for which you want the light fixture/circuit to automatically turn OFF.*

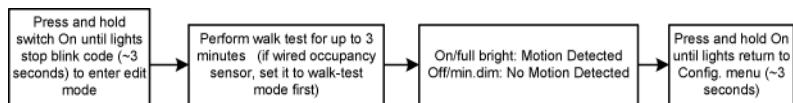
*Step 2: Wait 10 seconds for the Photosensor to measure and transmit the level to the Transceiver.*

*Step 3: Exit and save the setting.*



## 6.3 Blink Code 3: Walk Test Mode

The walk test mode allows the user to detect the range of the occupancy sensor without the wait time of the Transceiver delay timer. The Transceiver will turn the light fixture full bright or ON and full dim or OFF as the occupancy sensor triggers ON and OFF. Walk testing is activated immediately upon entering the walk test mode. The Transceiver will remain in this mode for 3 minutes or until the Switch is pressed ON or OFF, which will reset the timer for another 3 minutes. Wired occupancy sensors must be in walk test mode in order for this mode to function correctly.



## 6.4 Blink Code 4: Link Mode

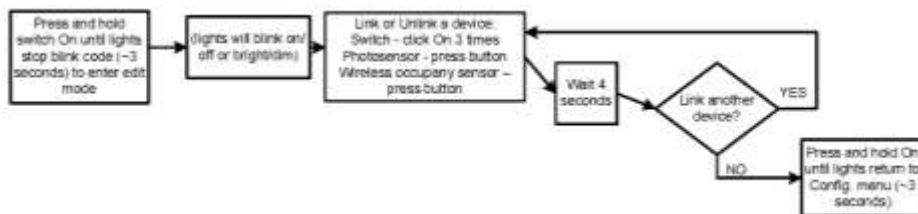
The light fixture/circuit will toggle ON/OFF or full bright/min.dim to indicate the Transceiver is in Link mode.

*Linking another Switch: click the Switch on or off 3 times rapidly.*

*Linking a Photosensor: press the Photosensor button once.*

*Linking a wireless occupancy sensor: press the occupancy sensor button once.*

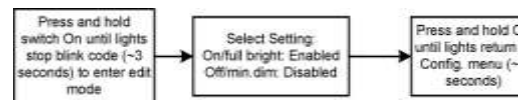
After linking each device, the light fixture/circuit will remain ON for 4 seconds. It will then begin toggling again to indicate the Transceiver is ready to learn another device. Previously linked devices can be unlinked by following this same process. Note: Link mode will timeout after 30 seconds of inactivity.



## 6.5 Blink Code 5: Repeater ON/OFF Mode

Repeater mode allows the user to 'repeat' the transmission of signals received from devices connected to the transceiver to other transceivers that may have been out of the transmission range of the original device.

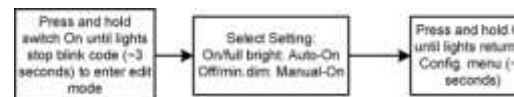
*Press ON from within repeater mode to set mode to enabled.*  
*Press OFF from within repeater mode to set mode to disabled.*  
*Press and hold ON to return to configuration mode menu.*



## 6.6 Blink Code 6: Occupancy Mode

Airwave systems can be used as Auto-ON/Auto-OFF or Manual-ON/Auto-OFF.

*The factory preset is Auto-ON. Press OFF from within occupancy mode to set mode to Manual-ON.*  
*Press and hold ON to return to configuration mode menu.*



## 6.7 Blink Code 7: Clear Mode

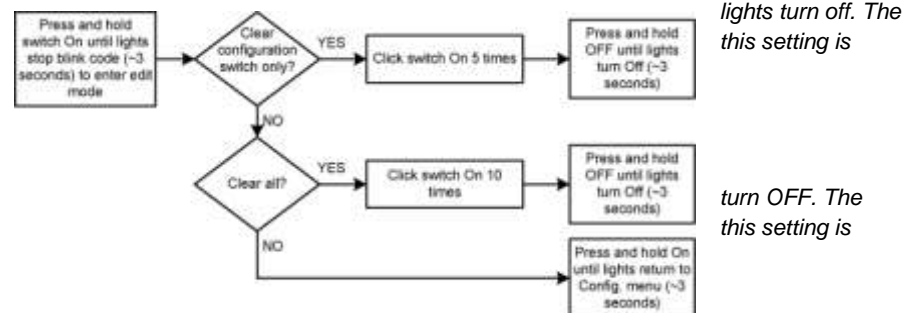
There are two levels of clearing a Transceiver in this mode: clearing only the Switch used to enter configuration mode and clearing all devices.

### 6.7.1 Clearing configuration Switch only:

*Click Switch ON 5 times rapidly.  
Exit and save. Press and hold OFF for approximately 5 seconds until configuration Switch will remain in operation with the Transceiver until saved and Transceiver is out of configuration mode.*

### 6.7.2 Clearing all devices:

*Click Switch ON 10 times rapidly.  
Exit and save. Press and hold OFF approximately 5 seconds until lights configuration Switch will remain in operation with the Transceiver until saved and Transceiver is out of configuration mode.*



## 6.8 Blink Code 8: Occupancy Transmit

The Transceiver connected to a wired occupancy sensor must transmit a link signal to a remote Transceiver that is in Link mode. There are two methods to accomplish this transmitted link signal.

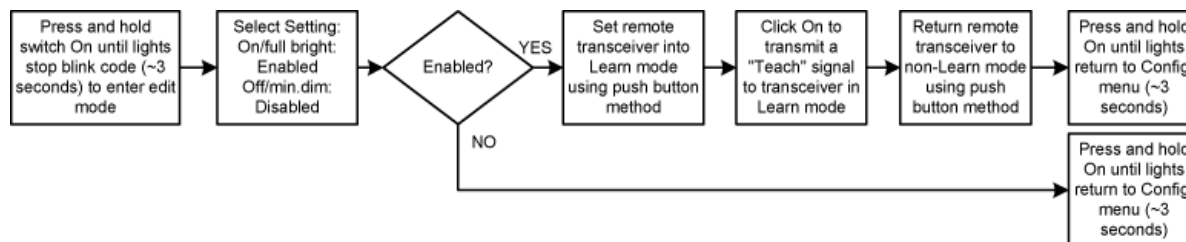
### 6.8.1 Configuration Mode Method

*After enabling the Occupancy Transmit setting in the configuration mode with an ON click, press the Switch ON again to transmit a link signal. Any Transceivers that are within range and in their Link mode will receive the signal and link with the original Transceiver.*

### 6.8.2 Transceiver Push Button Method:

*Save and exit from the configuration mode with occupancy transmit enabled.  
Set the remote Transceiver(s) in Link mode.*

*Press and hold the Link button on the occupancy Transceiver and then briefly press the Clear button before releasing the Link button. Any Transceivers that are within range and in their Link mode will receive the signal and link with the original Transceiver*

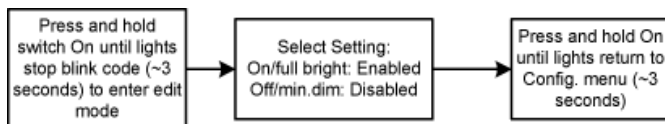


## 6.9 Blink Codes 9-12: Demand Response

The Demand Response (DR) functionality allows the Transceiver to respond to three wireless DR signals: Moderate, High, and Special. This allows the Transceiver to dim or turn off lighting based on load shedding signals from a central controller.

### 6.9.1 Blink Code 9: Enabling Demand Response

*After selecting the Demand Response in the configuration menu, press and hold switch ON until the lights stop blink code to enter edit mode.  
Press ON to Enable Demand Response for this Transceiver (Press OFF to disable Demand Response for this Transceiver).  
To exit edit mode, press and hold ON until lights return to configuration menu.*



### 6.9.2 Blink Codes 10-12: Adjusting Demand Response Levels

The Transceiver is factory set to 75% power draw for a Moderate DR event, 50% power draw for a High DR event, and 25% power draw for a Special DR event. The Demand Response settings for each DR event level (Moderate, High, Special) can be changed from the factory defaults.

*After selecting the desired DR event level to adjust (Moderate, High, or Special) in the configuration menu, press and hold switch ON until the lights stop blink code to enter edit mode.  
For dimming ballasts, adjust light level using quick clicks up/down to set light level.  
For non-dimming ballasts, click ON to set this level to keep fixture on during a DR signal of this level and OFF to set this level to turn fixtures OFF during a DR signal of this level.  
To exit edit mode, press and hold ON until lights return to configuration menu.*

