LightSync Ceiling Sensor
Programming and Control Settings
Technical Bulletin

The LightSync Ceiling Sensor (LSCS) control setting are programmed using the LightLEEDer Pro software, allowing remote over the wire configuration of the settings. This will include sensitivity of the PIR or acoustic sensors, time delay, enabling/disabling acoustic operation and the sensors LED status at the device.

Note: For LSCS device button operation's such as enabling the photosensor see PD0638

A. When configuring the LSCS digital sensor the installer would first set the 2-digit (HEX) address of the sensor in the same manner as any LightSync input device, refer to the project building riser layout for system device addressing.
Note: If the photosensor is activated then a 2nd LS address in series is automatically used.

B. In the ILC software a programmer will go to: **Edit**, **Switch Inputs**, **Configure Inputs** shown in Figure 1

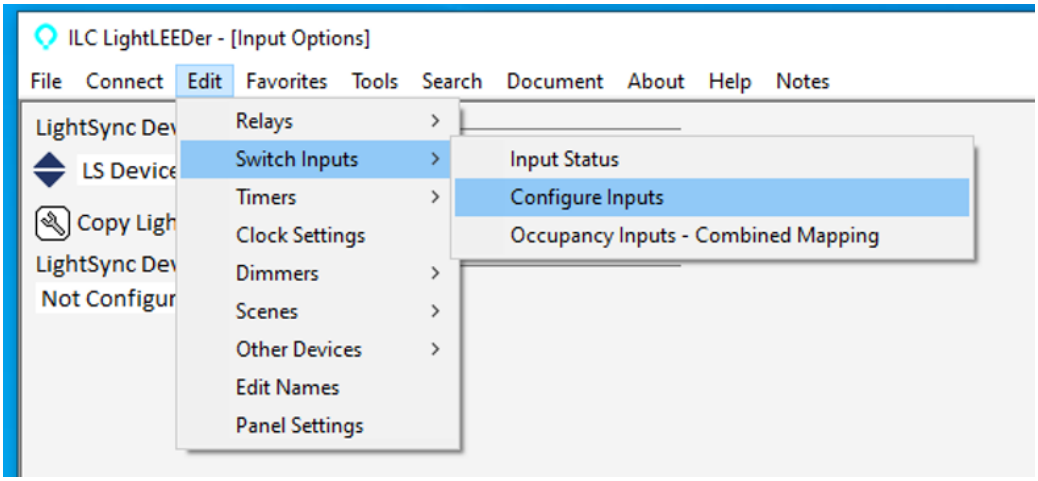

Figure 1

C. Select the LightSync device address for the sensor, and then select: **6 Button/8 Input/DT Sensor,** then select **Maintained On/Off** for Input 1, Type A: as shown in Figure 2
The sensor will use Input one(1) only for the return control signal as a maintained type closure to the ILC panel.

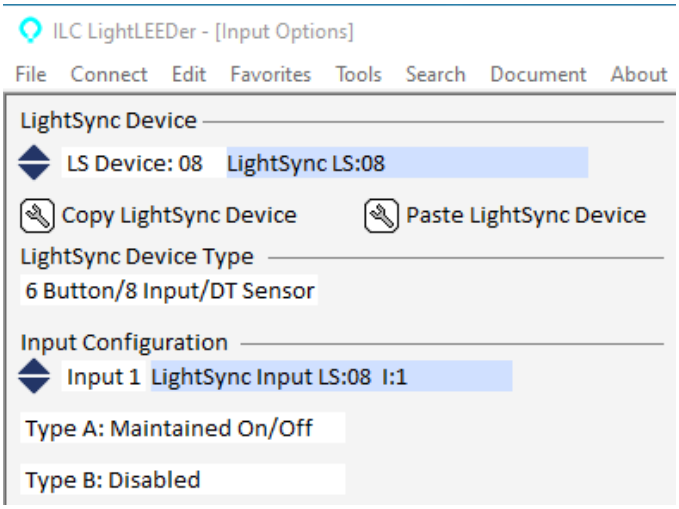

Figure 2

D. Under Pilot / Feedback / DT Settings there is a Tool button for **Dual Tech Sensor Settings (ALL 8 Pilots)** This will open a setting screen as shown in Figure 3. This tool has the setting options for the PIR and acoustic sensitivity, disable or enable of the LED indicators on the occupancy sensor, and the vacancy off delay time for the PIR and additional acoustic time duration used to hold the closure On after motion is no longer detected. There is a button for "Defaults" that will change the senor back to the factory default settings, plus Cancel and Save buttons.

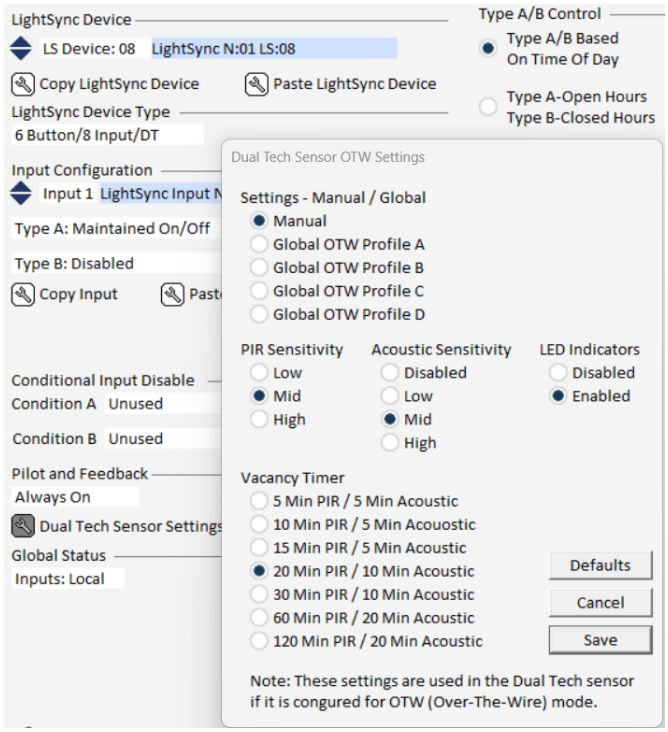

Figure 3 – Dual Tech Sensor Settings

E. There are also 4 Occupancy Global Profiles for sensors that would share the same settings, this can be used for any number of sensors that you want the control settings to match. Select the sensor profile A to D for each sensor, then configure the settings for each of the 4 profiles. This will allow a programmer to change the settings for each set of area sensors together without having to reconfigure each one, then on the next panel download the setting will all be changed together, refer to Figure 4.

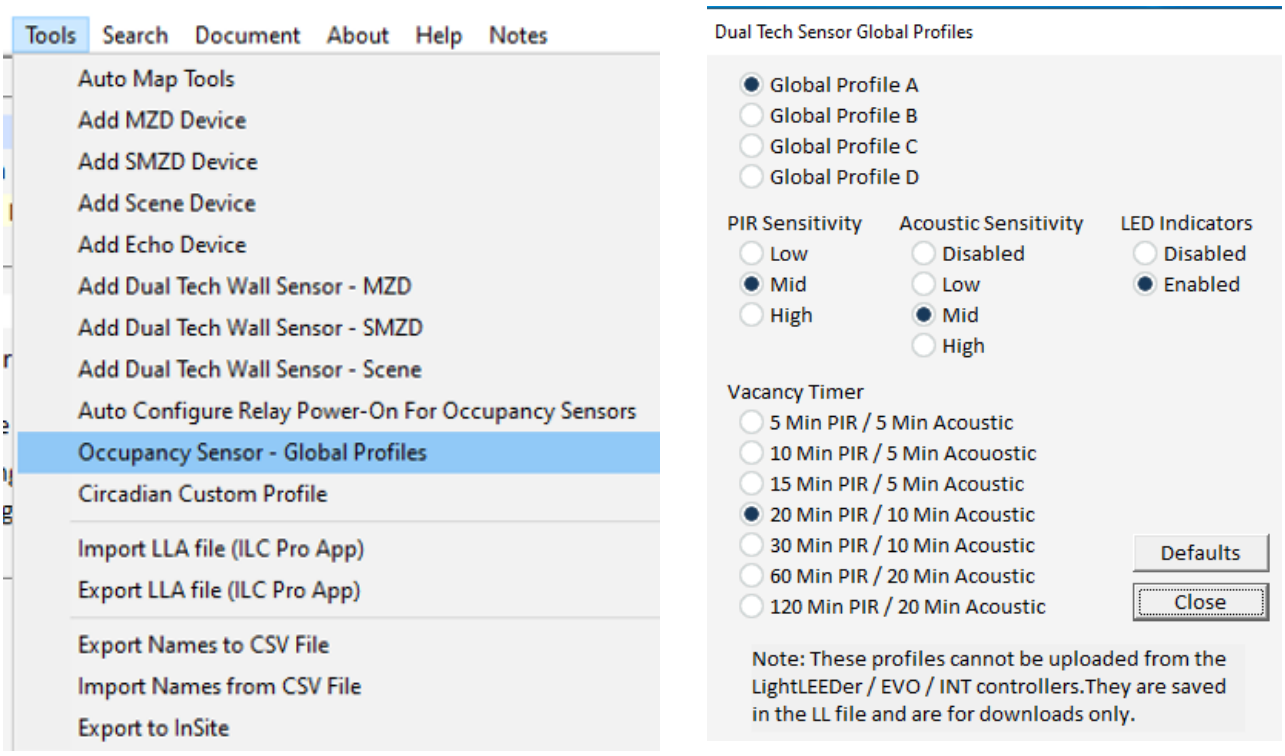

Figure 4 – Occupancy Profile Configuration.

F. Now that you have set-up the sensor input configuration settings you can map this sensor to control relay's On/Off for Occupancy or Off-Only for Vacancy operation. This may also include a Dimmer Control Option for occupancy and vacancy states – when the sensor triggers you can use a input control option line as a Goto 50%, or Goto 100% for On and use Invert Input to send the dimmer to 50% when no occupancy is sensed as shown in Figure 5.

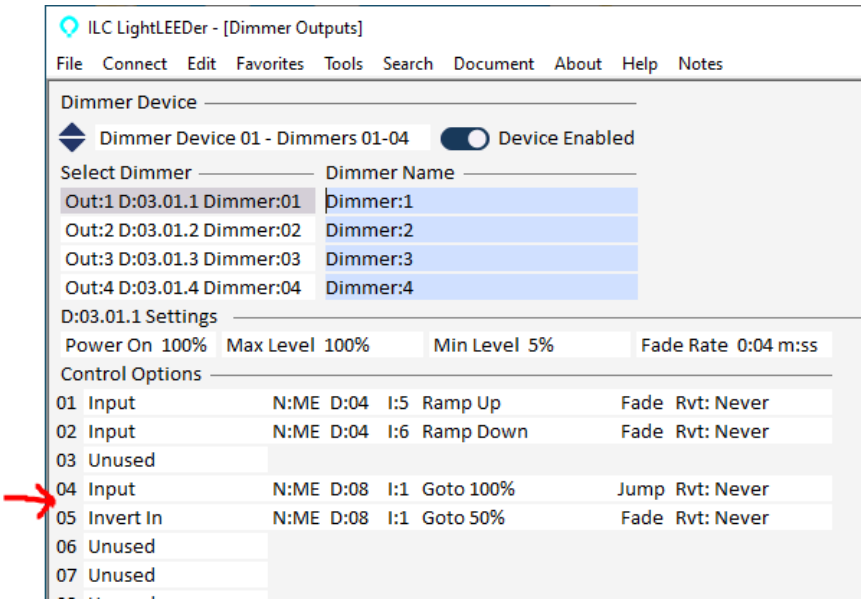

Figure 5 – Input to Dimmer Control

G. For rooms with multiple sensors such as a corridor, large office or classroom you will want to combine the sensors into one input. Go to Edit, Switch Inputs, then **Occupancy Inputs – Combined Mapping**. This page will allow you to use all 8 possible inputs of a single LS device, as shown in Figure 6. This will allow the user to combine any number of LightSync device's input 1 as a single control point and assign them to one of the 8 inputs of the virtual device. Any input in the combined set of sensors that closes is considered an On command, all combined inputs must be Off or open before an Off command is sent.

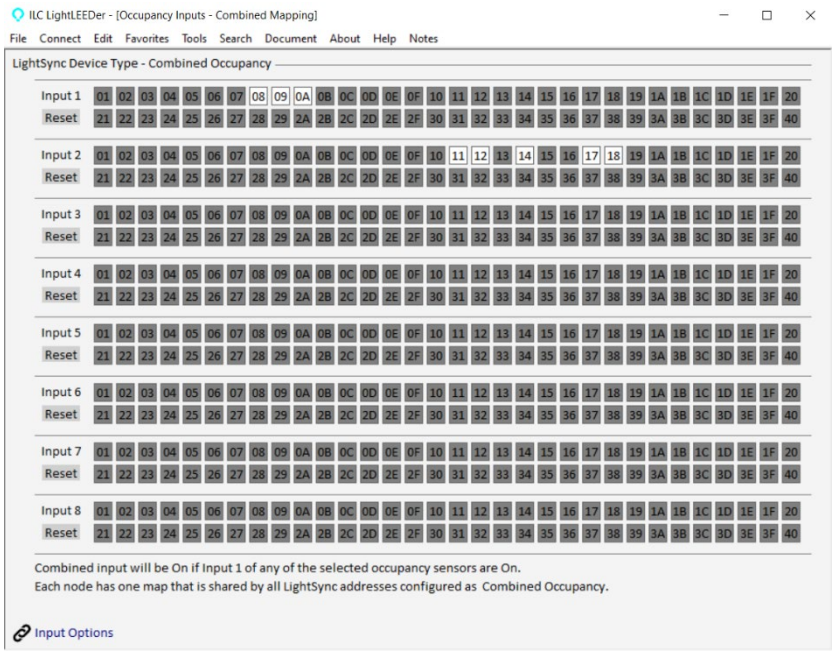

Figure 6 – Occupancy Inputs – Combined Mapping

H. Next you will need to chose a LightSync device address to be used for the combined inputs, each panel can support One(1) combined input virtual device. If the BAS or DDC system is using a BACnet connection to the ILC network with an Advanced BACnet Gateway, we suggest using a LS address below LS:10 for the occupancy combined input device (one of the first 16 LS devices). This virtual combined occupancy device will not be a physical module to set an address at but will use the programmed combined mapping configuration to track the physical inputs to be combined as shown in Figure 7.
Note that you will ***not*** want to directly map the individual physical occupancy senior inputs to the loads, but only map the combined inputs at the virtual LS address in order to have true If/Then combined operation.

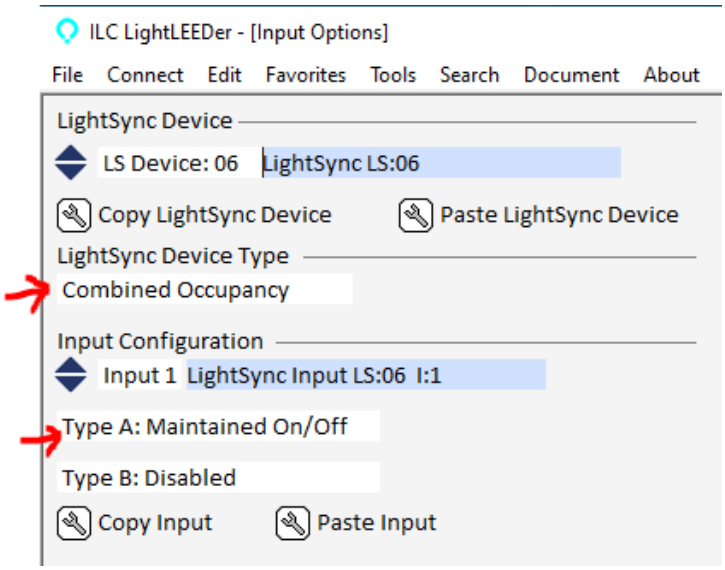

Figure 7 –Combined Occupancy Inputs

I. The LSCS also includes a Photosensor that can be activated using the button on the sensor, this option is factory disabled, see PD0638 for using the button on the face of the ceiling sensor to activate the photosensor. Once activated at the sensor, the next sequential LightSync device address will be used for the photosensor. This can then be configured in the same manner as any other ILC photosensor.

Sensor PIR/Acoustic Sequence

1. PIR trigger is required to start the sensor sequence. Input 1 turns On for set time duration.
2. Each additional PIR trigger will restart the PIR timer keeping input 1 On.
3. If the acoustic sensor is enabled each additional acoustic trigger will add 5, 10 or 20 minutes to the timer's current duration.
4. When this ends a "No PIR" timer starts for the acoustic 5, 10 or 20 minute window.
5. When the timer duration ends, and no PIR triggers are seen the device goes into an acoustic sensor window. Each new acoustic trigger will restart the timer for 5 minutes. When the acoustic window timer ends input 1 opens.
6. After input 1 turns off, acoustic triggers are ignored for 1 seconds, then a 17 second acoustic grace period is started allowing an acoustic trigger to restart the acoustic timer and turn input back On.
7. Once the 17 second grace period ends with no acoustic or PIR triggers the cycle is completed input 1 remains Off. Only a PIR trigger can restart the cycle and close input 1.

LED Status combinations for setting sent by the ILC software (OTW):

Input Pilots - Always ON/Off		PIR Sensitivity
1 – On	2 – Off	Low
1 – On	**2 – On**	**Mid (default)**
1 – Off	2 – On	High
1 – Off	2 – Off	Not allowed (Reverts to Low)

Input Pilots - Always ON/Off		Acoustic Sensitivity
3 – On	4 – Off	Low
3 – On	**4 – On**	**Mid (default)**
3 – Off	4– On	High
3 – Off	4 – Off	Disabled

Input Pilots - Always ON/Off			PIR Time	+ Acoustic Time
5 – Off	6 – Off	7 – Off	5 Minutes	+5 Minutes
5 – On	6 – Off	7 – Off	10 Minutes	+5 Minutes
5 – Off	6 – On	7 – Off	15 Minutes	+5 Minutes
5 – On	**6 – On**	**7 – Off**	**20 Minutes**	**+10 Minutes (default)**
5 – Off	6 – Off	7 – On	30 Minutes	+10 Minutes
5 – On	6 – Off	7 – On	60 Minutes	+20 Minutes
5 – Off	6 – On	7 – On	120 Minutes	+20 Minutes

Input Pilot - Always ON/Off	LED Indicator operation
8 – Off	Disabled
8 – On	**Enabled (default)**

Dual Tech sensor input functions and testing options

Input 1 Combined variable timed on
Held on at power-up until the internal 68 second start-up duration is complete.
Turns on when a PIR trigger is detected.
Turns off after the vacancy timer duration expires based on PIR/acoustic logic.
Note: When sensor is locally placed in test mode Input 1 tracks input 5.

Input 2 Over the Wire (OTW) or Local configuration setting
OTW set as default (Input Off)
Local configuration (Input ON)
Note: LL-Pro software cannot read the current setting if configured locally at the sensor, if a programmer changes the setting back to OTW they can over-wright the sensor setting from the software. Sensor setting are written down to the sensor using status feed back channels and cannot be uploaded from the sensor.

Input 3 PIR hit
Disabled during start-up duration.
Turns on for at least 0.25 seconds for each PIR trigger.

Input 4 Acoustic trigger
Turns on for 0.5 seconds for each acoustic trigger.

Input 5 Test mode
When the sensor is set for test mode, this input will turn on with a PIR trigger.
Input 5 is based on PIR only, Acoustic triggers are ignored.
Test mode remains on until no PIR triggers occur for 3 seconds, then the sensor automatically returns to normal operation.

Input 6 Test mode active
This input turns on when the button is tapped for test mode and remains on for 2 minutes.
This could be used during programming to identify a specific sensor in the software.

Input 7 DT sensor power-on timer complete
There is a 68 second power-on timer to allow the PIR to stabilize.
During this period, input 1 and 2 are disabled to prevent random triggers.

Input 8 Unused / always off