



Overview

The Automated Logic Wireless Transmitter measures the room temperature and transmits the data at 418MHz or 433MHz to a receiver. Some transmitters also include options such as Room Humidity, Temperature setpoint and an Override button which is also included in the RF transmission to the receiver. The transmitter is mounted in a LS3 style enclosure and has an open-air range of 100 feet. The transmit rate is approximately once every 20 seconds with an estimated battery life of 5 to 8 years using two high capacity 3.6V lithium batteries. Each transmitter has a unique address with built in error detection. Each variable is picked up by the Point Manager receiver or by an independent ALC/RCV receiver with separately mounted Analog Output Modules for conversion into a voltage, current or resistance signal for the controller.

Notes:

1. For independent system receivers (ALC/RCV), the installation process requires that each transmitter and its associated output modules be trained to each other in a binding process.
2. Training is easiest when the units are within arm's reach of each other but can be done in the field. Field training requires two people and a set of walkie talkies or cell phones. (See output module training later in this document.)
3. Be sure to place a unique identification mark on the transmitter and associated output modules after they have been trained so that they can be matched together at the job site.
4. If more than one variable is transmitted, each variable requires a separate output module. Perform the training sequence for each output module.
5. Any transmitted variable can be trained to more than one output module.
6. There are two sections that describe how to train the override function; 1. Override in parallel with setpoint or in parallel with space temperature; 2. Override as a separate output. Remember that the override is trained by pressing the **override** button, not the transmitter **training** button.

Wireless System Block Diagrams

Fig 1: General Wireless System Diagrams

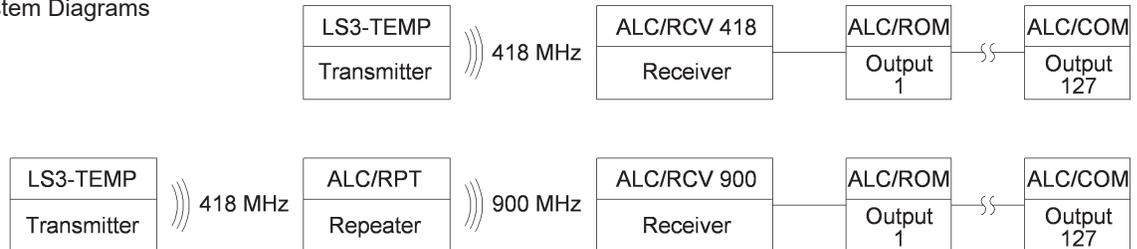


Fig 2: 418 MHZ Wireless Point Manager Diagram

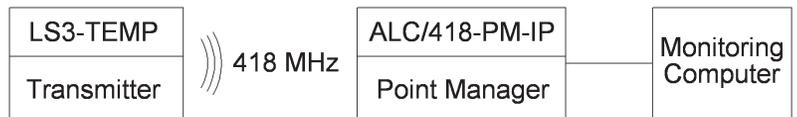


Fig 3: 900 MHZ Wireless Point Manager Diagram

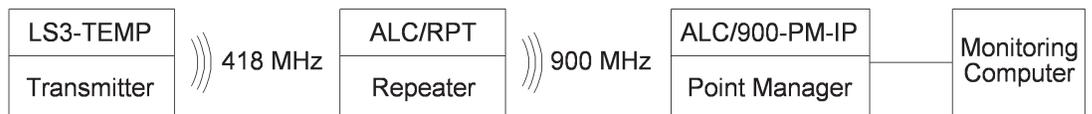
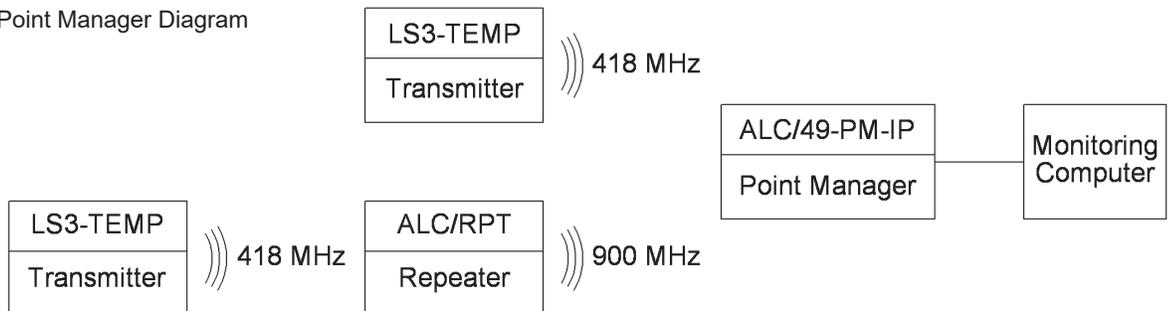


Fig 4: Mixed Frequency Point Manager Diagram



Product Identification

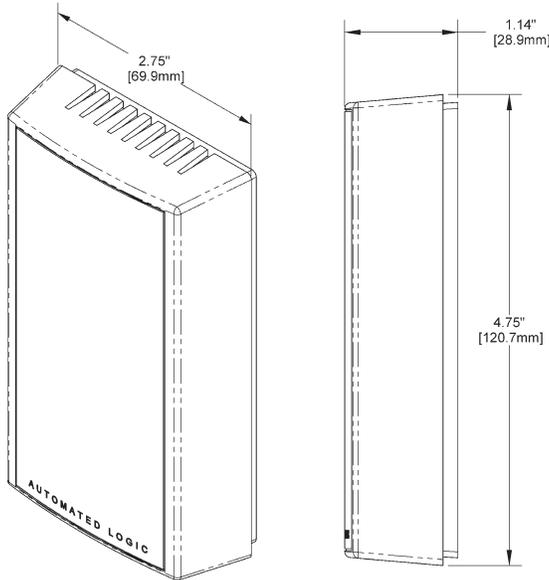


Fig 5: LS3 Dimensions

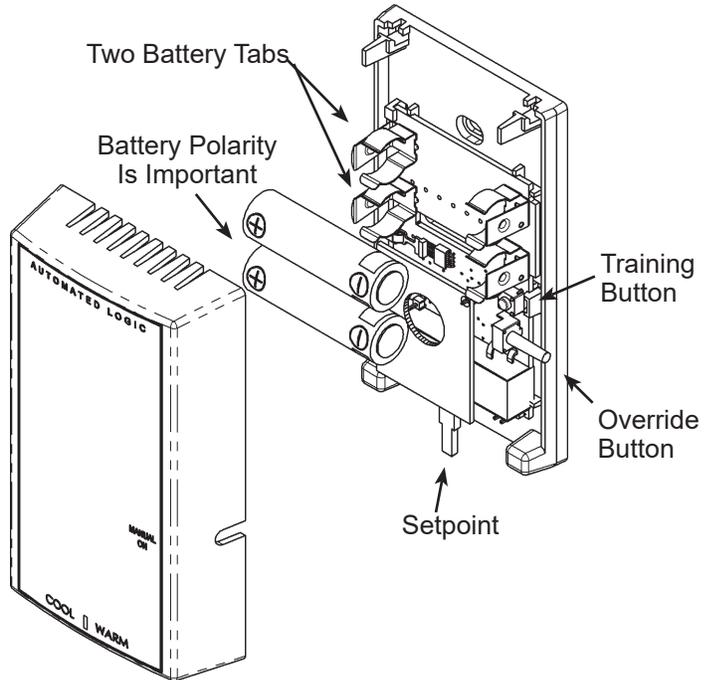


Fig 6: LS3-WT Interior I.D.

Mounting

The wireless installation process is most effectively accomplished by training the room transmitters first with the output modules before they are mounted in their final location. After each module is trained, the batteries can be removed for mounting. The training is permanently retained by the modules in non-volatile memory.

Drywall Mounting

1. Place the base plate against the wall where you want to mount the sensor. Typically 5 feet above the floor.
2. Using a pencil, mark out the two mounting holes.
3. Drill two 3/16" (4.7 mm) holes in the center of each marked mounting hole. Insert a drywall anchor into each hole.
4. Secure the base to the drywall anchors using the #6 x 1 inch mounting screws provided.
5. Remove battery tabs or Install provided batteries and follow polarity as shown above in Fig 6 or damage may occur. The unit will work on just one battery however the battery life will be cut in half.
6. Attach cover by latching it to the top of the base, rotating the cover down and snapping it into place.
7. Secure the cover by backing out the lock-down screws using a 1/16" Allen wrench until they are flush with the bottom of the cover.

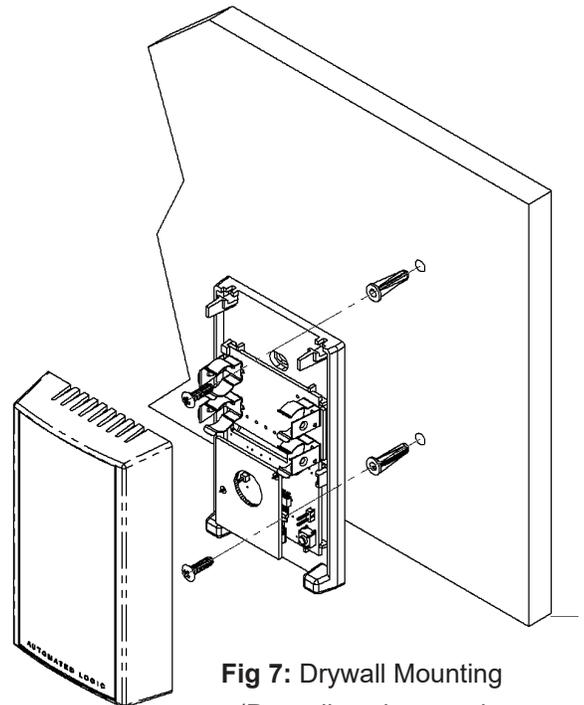


Fig 7: Drywall Mounting
 (Drywall anchors and #6x1" screws provided)

Output Module Training continued...

Temperature - Analog Output Module Training

1. To train an output module to a **Temperature** variable, select an output module, ALC/(VOM, ROM or COM) calibrated to the temperature range you need and connect it to the receiver.
2. Apply power to the receiver and output modules. The power LED on the Receiver should light and remain lit.
Reminder: Loop power must be connected and turned on for current output modules, ALC/COM.
3. Remove the cover of the transmitter and remove battery tabs or install the batteries, observe polarity or damage to the unit may occur. The small LED at the bottom right of the circuit board, next to the setpoint (see Fig 6), should flash approximately once every 20 seconds indicating a transmission. (The flash is very quick.)
4. Press and hold down the **Service Button** on the output module (Fig 8). Then, press and release the training button (Fig 6) on the transmitter. When the output module has received a valid data packet from the transmitter the output module's red LED will light and remain lit as long as you hold down the output module's service button. Release the service button on the output module and the output module's LED will go out. During normal operation the output module's LED will flash indicating data reception approximately once every 20 seconds in time with the transmitter trained to it. The output module is now receiving data from the transmitter.
5. Mount the transmitter at the desired location. See **Mounting** on page 2.

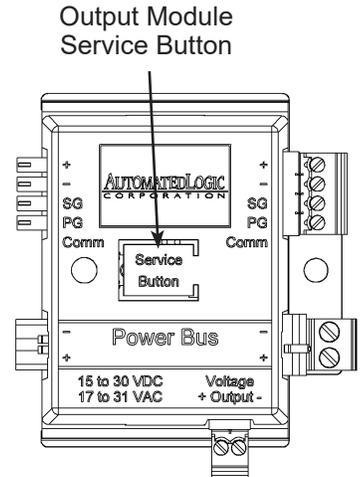


Fig 8: Output Module

Humidity - Analog Output Module Training

1. To train an output module to a **Humidity** variable, select an output module, ALC/(VOM, COM)-M, calibrated to the humidity range you need and connect it to the receiver.
2. Apply power to the receiver and output modules. The power LED on the Receiver should light and remain lit.
Reminder: Loop power must be connected and turned on for current output modules, ALC/COM.
3. Remove the cover of the transmitter and remove battery tabs or install the batteries, observe polarity or damage to the unit may occur. The small LED at the bottom right of the circuit board, next to the setpoint (see Fig 6), should flash approximately once every 20 seconds indicating a transmission. (The flash is very quick.)
4. Press and hold down the **Service Button** on the output module (Fig 8). Then, press and release the training button (Fig 6) on the transmitter. When the output module has received a valid data packet from the transmitter the output module's red LED will light and remain lit as long as you hold down the output module's service button. Release the service button on the output module and the output module's LED will go out. During normal operation the output module's LED will flash indicating data reception approximately once every 20 seconds in time with the transmitter trained to it. The output module is now receiving data from the transmitter.
5. Mount the transmitter at the desired location. See **Mounting** on page 2.

Setpoint - Analog Output Module Training

1. To train an output module to a **Setpoint** variable, select an output module, ALC/SOM, calibrated to the setpoint range you need and connect it to the receiver.
2. Apply power to the receiver and output modules. The power LED on the Receiver should light and remain lit.
Reminder: Loop power must be connected and turned on for current output modules ALC/SOM-16.
3. Remove the cover of the transmitter and remove battery tabs or install the batteries, observe polarity or damage to the unit may occur. The small LED at the bottom right of the circuit board, next to the setpoint (see Fig 6), should flash approximately once every 20 seconds indicating a transmission. (The flash is very quick.)
4. Press and hold down the **Service Button** on the output module (Fig 8). Then, press and release the **OVERRIDE** button (Fig 6) on the transmitter. (NOTE: If unit was not ordered with an override button, the button is inside the

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Output Module Training continued....

case). When the output module has received a valid data packet from the transmitter, the output module's red LED will light and remain lit as long as you hold down the output module's service button. Release the service button on the output module and the output module's LED will go out. During normal operation the output module's LED will flash indicating data reception approximately once every 20 seconds in time with the transmitter trained to it. The output module is now receiving data from the transmitter.

5. Mount the transmitter at the desired location. See **Mounting** on page 2.

Override in Parallel with Setpoint or Temperature - Analog Output Module Override Training

1. An **Override** variable can only be trained in parallel with a previously trained **Setpoint** or **Temperature** output module. Train the **Setpoint** or **Temperature** output module as described above. Remove the Output Module's cover by squeezing the top and bottom of the cover as shown in Fig 9. Apply power to the receiver and output modules ALC/(VOM,ROM,COM). **Note:** Loop power must be connected and turned on for current output modules, ALC/COM.
2. The power LED on the Receiver should light and remain lit.
3. Remove the cover of the transmitter and remove battery tabs or install the batteries, observe polarity or damage to the unit may occur. The small LED at the bottom right of the circuit board, next to the setpoint (see Fig 6), should flash approximately once every 20 seconds indicating a transmission. (The flash is very quick.)
4. Place the previously trained **Temperature** or **Setpoint** output module's jumper J4 in the Override Training Position. (See Figs 10 and 11) Press and hold down the **Service Button** on the output module (Fig 8). Then, press and release the **OVERRIDE** button (Fig 2) on the transmitter. When the output module has received a valid data packet from the transmitter, the output module's red LED will light and remain lit as long as you hold down the output module's service button. Release the service button on the output module and the output module's LED will go out. During normal operation the output module's LED will flash indicating data reception approximately once every 20 seconds in time with the transmitter trained to it. The output module is now receiving data from the transmitter. Remove the jumper on J4 and store it on the right Storage Position Pin (Fig 11). Replace the Output Module's cover.
5. If you wish to un-attach the override function on an output module, re-train the output module to the first variable, **Temperature** or **Setpoint**. This erases the override function on the output module.
6. Mount the transmitter at the desired location. See **Mounting** above.

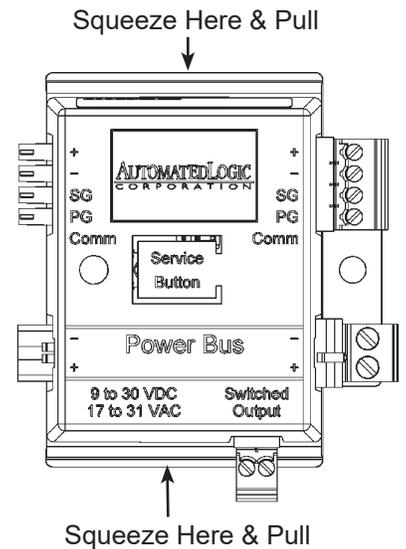


Fig 9: Output Module Cover Removal

Override in Parallel with Setpoint or Temperature - Analog Output Module Override Training

1. An **Override** variable can only be trained in parallel with a previously trained **Setpoint** or **Temperature** output module. Train the **Setpoint** or **Temperature** output module as described above. Remove the Output Module's cover by squeezing the top and bottom of the cover as shown in Fig 9. Apply power to the receiver and output modules ALC/(VOM,ROM,COM). **Note:** Loop power must be connected and turned on for current output modules, ALC/COM.
2. The power LED on the Receiver should light and remain lit.
3. Remove the cover of the transmitter and remove battery tabs or install the batteries, observe polarity or damage to the unit may occur. The small

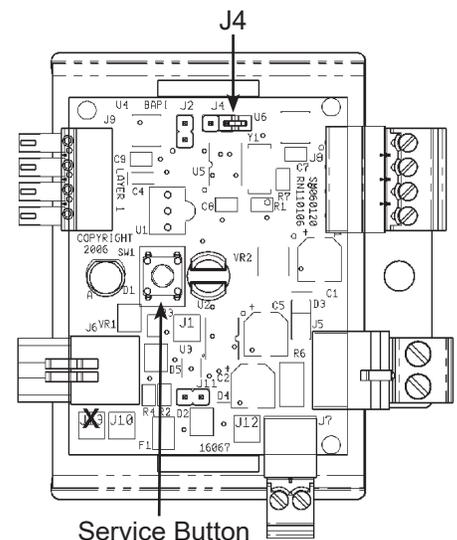


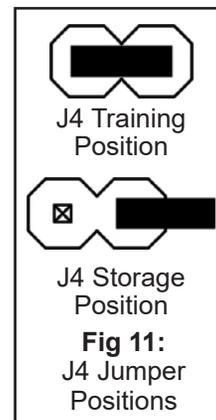
Fig 10: Output Module J4 & Service Button ID

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Output Module Training continued....

LED at the bottom right of the circuit board, next to the setpoint (see Fig 6), should flash approximately once every 20 seconds indicating a transmission. (The flash is very quick.)

4. Place the previously trained **Temperature** or **Setpoint** output module's jumper J4 in the Override Training Position (see Figs 10 and 11). Press and hold down the **Service Button** on the output module (Fig 8). Then, press and release the **OVERRIDE** button (Fig 2) on the transmitter. When the output module has received a valid data packet from the transmitter, the output module's red LED will light and remain lit as long as you hold down the output module's service button. Release the service button on the output module and the output module's LED will go out. During normal operation, the output module's LED will flash indicating data reception about once every 20 seconds in time with the transmitter trained to it. The output module is now receiving data from the transmitter. Remove the jumper on J4 and store it on the right Storage Position Pin (Fig 11). Replace the Output Module's cover.
5. If you wish to un-attach the override function on an output module, re-train the output module to the first variable, **Temperature** or **Setpoint**. This erases the override function on the module.
6. Mount the transmitter at the desired location. See **Mounting** on page 2.



Override as Separate Output – Relay Output Module Override Training

1. To train an output module to an **Override** variable, connect a **ALC/RYOM** output module the receiver.
2. Apply power to the receiver and output modules. The power LED on the Receiver should light and remain lit.
3. Remove the cover of the transmitter and remove battery tabs or install the batteries, observe polarity or damage to the unit may occur. The small LED at the bottom right of the circuit board, next to the setpoint (see Fig 6), should flash approximately once every 20 seconds indicating a transmission. (The flash is very quick.)
4. Press and hold down the **Service Button** on the output module (Fig 8). Then, press and release the **OVERRIDE** button (Fig 6) on the transmitter. When the output module has received a valid data packet from the transmitter, the output module's red LED will light and remain lit as long as you hold down the output module's service button. Release the service button on the output module and the output module's LED will go out. During normal operation the output module's LED will flash indicating data reception approximately once every 20 seconds in time with the transmitter trained to it. The output module is now receiving data from the transmitter.
5. Mount the transmitter at the desired location. See **Mounting** on page 2.

Table 1: Under Cover J4 Position to Train Output Modules				
Room Transmitter Variable Training	Output Module J4 Position J4, ON or OFF, (Fig. 10 & 11)	Output Module Training Button		Field Transmitter Training Button
Room Temperature	OFF (standard VOM, COM & ROM Modules)	Service Button	+	SW1 Training Button
Room Humidity	ON (standard for all -M or -N modules)	Service Button	+	SW1 Training Button
Setpoint Temperature	OFF (standard for SOM analog modules)	Service Button	+	SW2 Override Button
Override Button	ON (standard for RYOM, DO modules)	Service Button	+	SW2 Override Button
Output Module Override Training	Analog Output Module J4 Position J4, ON, (Fig. 10 & 11)	Analog Output Module Training Button		Field Transmitter Training Button
Override Training**	ON* (Change as needed, see above)	Service Button	+	SW2 Override Button

* After override training, put J4 back to the OFF position on standard output modules VOM, COM, ROM, & SOM types. Leave J4 in the ON position for -M or -N output modules (RH%) and on RYOM digital output (DO) modules.

**Standard variable signal training must be completed first before override training is attempted. If the standard signal is re-trained to the same output module again, the override training is erased.

Override Operation Sequence

The variable outputs are trained to the output modules as selected and represent the measured signal value (Temp, RH, & Setpoint) from the transmitter. After override training, the output modules selected receive the override button operation wirelessly and change its measured signal output to a low signal value (see Specifications) for 5 seconds then resumes back to the measured signal value



Operating Notes (Not applicable if a Point Manager is used).

1. If you need to train any temperature, humidity, setpoint or override value from a single transmitter to more than one controller, you may train multiple output modules to that value.
2. If an output module does not receive data from its assigned transmitter for 15 minutes the red LED on the output module will blink rapidly. The module output signals will react as follows;
 - Voltage output modules calibrated for temperature will set their output to zero volts.
 - Current output modules calibrated for temperature will set their outputs to 4 milliamps
 - Resistance output modules calibrated for temperature will set their outputs to their highest resistance, lowest temperature, values.
 - Voltage output modules calibrated for humidity will set their outputs to the maximum of 5 VDC or 10 VDC.
 - Current output modules calibrated for humidity will set their outputs to the maximum of 20 milliamps.
 - Setpoint output modules will hold their last values indefinitely.
 - Relay output modules will go to their normal output, open or closed depending on module selected.
3. Output modules are trained to a transmitter simulator during BAPI's final test. When you receive them they will not be trained to any of the transmitters in your shipment. Do not be alarmed if the output module's LED blinks rapidly upon power up or shortly thereafter, just train the output module to a transmitter and all will be OK.
4. The ALC/RCV receivers and ALC/xOM output modules are inter-connected and require module power along the power bus on the two bottom terminals. The bus can be powered from either the receiver end (left side) or the last output module (right side). Be sure you have enough DC current or AC VA for all the devices on the bus.
5. The ALC/COM-a or ALC/SOM-16 (Current Analog Output Module) signal is **LOOP POWERED** and must be externally powered (9-36 VDC) so that the BAS input receives the analog current signal. Other Analog Output Modules source the analog output from the power bus.
6. The printed lines on the ALC/RCV receivers represent the power buss flow and are just there for appearance. They **do not** represent an electrical wire connection. Always be sure to follow the polarity (+ or -) listed on each module to maintain communication and power buss integrity.

Specifications

Supply Power:

Two AA 3.6V Lithium batteries, 2.25 AH
 5 to 8 year battery life at 20 second transmit rate

Potential Inputs:

Temperature - Thermistor
 Relative Humidity – Capacitive
 Setpoint – Potentiometer
 Override – SPST switch

Accuracy:

±0.9°F (±0.5°C) @ 77°F (25°C), 41 to 113°F (5 to 45°C)
 ±3.0%RH @ 77°F (25°C), 20 to 80%RH

Transmitted Range:

-40° to 185°F (-40° to 85°C)
 0 to 100% RH

Antenna: Built inside the enclosure

Environmental Operation Range:

Temp: 32° to 140°F (0° to 60°C)
 Humidity: 5% to 95% RH non-condensing

Material: ABS Plastic

Material Rating: UL94 V-0

Radio Frequency:

418 MHz North America
 433 MHz International (Outside North America)

Transmitter Interval: ~20 seconds

FCC Approval:

FCC ID# T4F061213RSO (418MHz only)

Output Module override value for 5 seconds:

ALC/VOM	0v
ALC/COM	4 mA
ALC/SOM	0v or 4mA (Module Dependent)
ALC/ROM	Less than 100Ω
ALC/RyOM	Energized