

Logic One[®] System Enhancer (LSE) Programming Instructions

Overview

Novar's Logic One System Enhancer (LSE) is a protocol translator that administers software licenses and provides software connections between the Logic One system and equipment from other vendors.

The LSE is compatible with the following Novar executive modules:

- Savvy[®] Version 53.00 or greater
- Envoi[®] Version 53.00 or greater
- Lingo[®] XE Version 1.08 or greater
(It is not compatible with Novar's Lingo or Lingo SE.)

These instructions apply to the following seven models of the LSE that interface with Lennox Industries' Integrated Modular Controller (IMC) network:

- LSE-01: LSE with software license for 1 IMC Connection
- LSE-05: LSE with software license for 5 IMC Connections
- LSE-10: LSE with software license for 10 IMC Connections
- LSE-15: LSE with software license for 15 IMC Connections
- LSE-20: LSE with software license for 20 IMC Connections
- LSE-25: LSE with software license for 25 IMC Connections
- LSE-31: LSE with software license for 31 IMC Connections

Compatibility with Lennox Equipment

The LSE provides an interface between the Novar Logic One system and Lennox L Series[®] and S-Class[™] rooftop units that contain the IMC. It also works with properly equipped Lennox Humiditrol[®] and supermarket dehumidification systems.

NOTE! The IMC must be version 5.03 or greater. An IMC's version can be determined by flipping the top two Mode DIP switches (labeled "Unit" and "Recall") to the on position (to the right). After three seconds, the IMC's version will appear on the IMC's Liquid Crystal Display. The DIP switches must be returned to their original position after the version has been determined. (Older versions of the IMC can be upgraded. Lennox can provide details.) The IMC module will not communicate with the executive while these switches are set to on. They must be restored to the off position.

System Architecture

The LSE resides on the Novar communications network along with all other Novar control modules. It contains wiring connections for the module network of the Novar Logic One system and the Lennox IMC communications network. Figure 1 provides a simple overview of this architecture and addressing.



Figure 1. System architecture

Executive Module Capacity

One Novar executive module can support multiple LSEs. LSEs do not count against an executive's module resource allocation limit. Executive modules are limited in the number of IMC loads they can accommodate. The total number of IMC loads cannot exceed the executive's limit. For example, a Savvy-31 can support a maximum of 31 IMC connections .

Hardware Addressing

Novar's ESS32 software offers a new IMC load type that represents one software connection to a Lennox IMC within the rooftop HVAC unit. For programming purposes, the LSE has an address (1, 2, 10, 11, etc.), and each IMC has a three-digit address (001, 002, etc.) that is added to the LSE address as an extension (10-001, 10-002, etc., as shown in Figure 1). The LSE's hardware address does not count against the executive module's allocation limit.

Lennox IMC Setup

The IMC contains an integral pushbutton and a three-digit Liquid Crystal Display (LCD) that can be used to adjust the Lennox ECTO I (Electronic Configure to Order) parameters. If any, only minor adjustments should be necessary. There are two documents published by Lennox Industries that apply. The first is a summary that pertains specifically to the LSE interface. The second is the entire M1-7 (IMC manual):

- *Novar LSE Gateway Integration Kit—Installation Instructions for Packaged Units Equipped with an IMC Controller* (available from Novar or Lennox)
- *Guide to the M1-7 Version 5.0x Integrated Modular Control Used in L Series and S-Class 3 Through 50 Ton Units* (available from Lennox Industries)

The telephone number for Lennox National Account Technical Support is 800.367.6285.

Sensors

Zone temperature, supply-air temperature, and return-air temperature sensors are connected to the IMC (not to a Novar controller). Other sensors (mixed-air temperature, outside-air temperature, etc.) can also be connected to an IMC.

Programming the LSE

LSE programming options in ESS32 are spread over two screens (Figures 2 and 3). To modify a parameter, the user enters the parameter’s number at the prompt at the bottom of the screen, enters the appropriate option or uses the keyboard arrow keys to select the appropriate option, and presses **enter**. To move back and forth between the screens, the user presses **Tab**. To display temporary setpoints, the user can press **F3**.

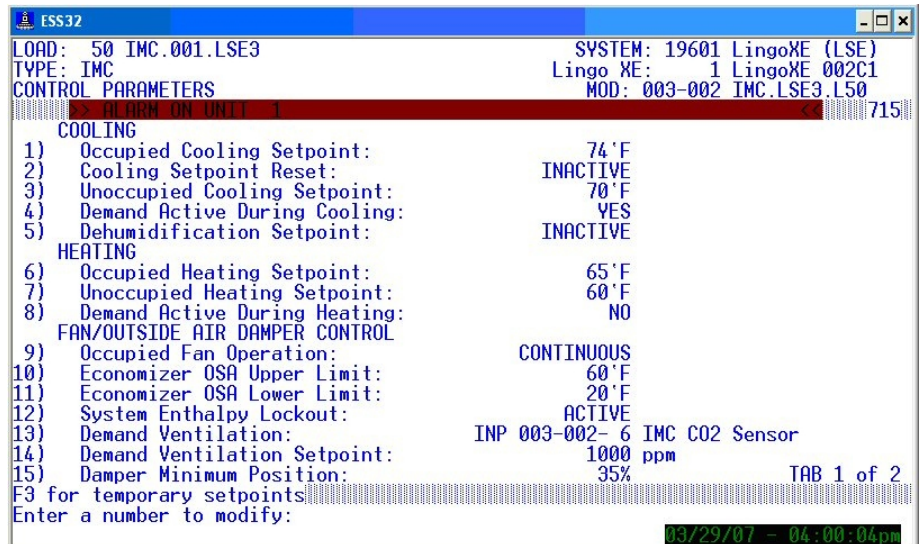


Figure 2. LSE programming screen, Tab 1

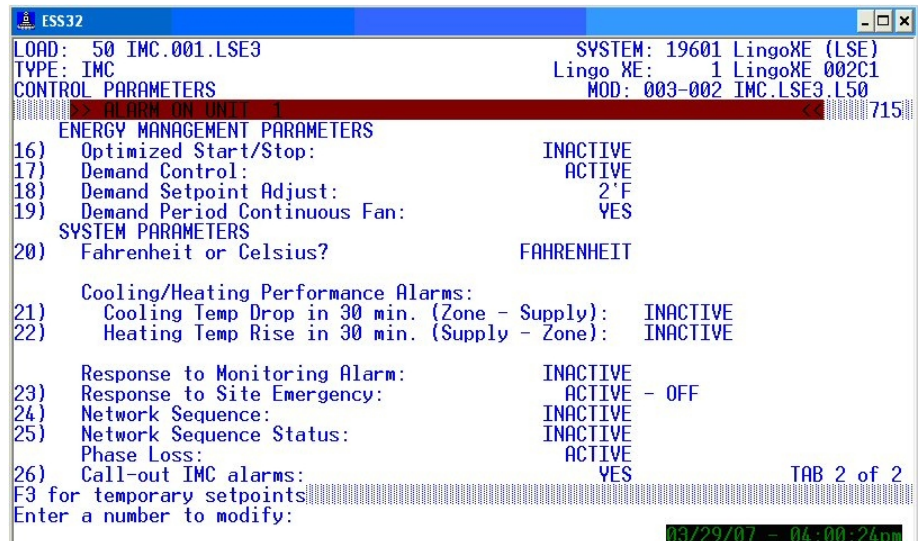


Figure 3. LSE programming screen, Tab 2

The parameters are explained below.

Cooling Parameters

Occupied Cooling Setpoint

- **Fixed** allows the programmer to enter a single occupied cooling setpoint. The setpoint cannot be within 3 degrees of the heating setpoint.
- **Reset** allows the programmer to select a sliding reset that will vary the occupied cooling setpoint as a sensor value somewhere else in the system changes. If this option is selected, the user is required to enter the setpoint range and cooling reset range used for the setpoint calculation (see Cooling Setpoint Reset below).

A sliding reset can be set up so that the cooling setpoint varies based on either the global outside air temperature or a global humidity sensor as defined in the executive module's parameters. If no global humidity sensor is defined, no **Reset** option will be offered for this sensor.

Cooling Setpoint Reset

If **Reset** is selected for the Occupied Cooling Setpoint parameter above, the range for the reset sensor is entered here.

Unoccupied Cooling Setpoint

This parameter is used to establish the unoccupied cooling setpoint.

Demand Active during Cooling

If the Demand Control parameter (#17) is **Active** for this device, this parameter is used to indicate if cooling is to respond during a shed condition.

Dehumidification Setpoint

This parameter is used to enter a dehumidification setpoint for specially equipped Humiditrol or Supermarket dehumidification systems. If the humidity goes above this point, the systems will go into their dehumidification cycle.

Heating Parameters

Occupied Heating Setpoint

This parameter is used to establish the occupied heating setpoint.

Unoccupied Heating Setpoint

This parameter is used to establish the unoccupied heating setpoint.

Demand Active during Heating

If the Demand Control parameter (#17) is **Active** for this device, this parameter is used to indicate if heating is to respond during a shed condition.

Fan/Outside Air Damper Control Parameters

Occupied Fan Operation

- **Continuous** allows the fan to operate continuously during occupied hours.
- **Auto** allows the fan to operate only during a demand for heating, cooling, economizer (free cooling), or demand ventilation.

NOTE! The RTU will not go into a free cooling (economizer) cycle until the Novar system parameters for space temperature, outside air temperature and/or enthalpy are met. Novar enables the economizer at 1 degree below the cooling setpoint. When the Novar parameters are met, the Lennox IMC takes control of the economizer cycle and may or may not open the economizer immediately. It will open the damper only when the space temperature setpoint meets the setpoint defined by Lennox ECTO parameters. By default, free cooling is enabled at 0.5 degrees above the cooling setpoint and disabled at 0.5 degrees below the cooling setpoint, but these parameters can be adjusted via the IMC's push-button display. In all circumstances, the user can monitor the response from the monitoring screen, which displays the economizer damper position.

Economizer OSA Upper Limit

This parameter is used to establish a maximum outside air temperature setpoint that, if exceeded, will disable the economizer damper.

Economizer OSA Lower Limit

This parameter is used to establish a minimum outside air temperature setpoint that, if exceeded, will disable the economizer damper.

System Enthalpy Lockout

The options are **Active** and **Inactive**. If the programmer selects **Active**, the economizer damper will respond to the status of the global enthalpy load that is defined in the executive modules parameters.

Demand Ventilation

This is an energy-saving, comfort feature that allows the outside air damper to stay fully closed until a user-defined CO₂ level has been exceeded. At that point, the outside air damper opens to the defined minimum position.

To make this function active, the programmer chooses **Input Point** or **Virtual Point** and, at the prompt, selects a real input or virtual point to be used for the demand ventilation function.

Demand Ventilation Setpoint

If the Demand Ventilation parameter is active, this parameter is used to define the CO₂ setpoint below which the outside air damper will stay fully closed. Above this setpoint, the damper will open to the position defined for the Damper Minimum Position parameter.

Damper Minimum Position

This parameter is used to establish the minimum position for the outside air damper so that ventilation will be provided during occupied hours. If the Demand Ventilation parameter is active, this setpoint is ignored until the CO₂ level rises above the value specified for the Demand Ventilation Setpoint parameter.

Energy Management Parameters

Optimized Start/Stop

- Selecting **0** deactivates both the optimized start and stop.
- Selecting **1** activates the optimized start and deactivates the optimized stop.
- Selecting **2 to 10 F** activates the optimized start and defines how far the temperature can drift during optimized stop.

Optimized stop will not advance the stop time to more than 30 minutes before the programmed scheduled off time.

Demand Control

- **Active** displays the demand shed registers so the programmer can enter this load and define the maximum shed condition off time and a minimum on time that must occur before this load can be shed again.
 - **Inactive** prevents this load from being shed in response to building kW demand.
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Demand Setpoint Adjust

- **Load Off** turns off the heating and/or cooling during a shed condition.
 - **Setpoint Adjust** establishes how much the cooling setpoint should be raised and the heating setpoint lowered during a demand shed condition. This indicates that comfort has a higher priority than load shedding if the temperature drifts too far from normal setpoints.
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Demand Period Continuous Fan

- **Yes** allows the fan to be turned on or remain on during a shed condition that turns off the heating and/or cooling.
 - **No** automatically turns the fan off during a shed condition.
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System Parameters

Fahrenheit or Celsius

- **Fahrenheit** units will be used to display all related temperatures.
 - **Celsius** units will be used to display all related temperatures.
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Cooling and Heating Performance Alarms

- **Cooling Temperature Drop in 30 Minutes (Zone–Supply)** defines the temperature difference that must occur between the zone temperature and the supply (discharge) air temperature sensors 30 minutes after the unit has been at 100% cooling. If the system cannot attain the specified amount, a Cooling Performance Alarm will be generated.
 - **Heating Temperature Rise in 30 Minutes (Supply–Zone)** defines the temperature difference that must occur between the zone temperature and the supply (discharge) air temperature sensors 30 minutes after the unit has been at 100% heating. If the system cannot attain the specified amount, a Heating Performance Alarm will be generated.
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Response to Monitoring Alarm

This parameter can only be activated via a monitoring alarm point that has been programmed to affect the operation of this load.

- **Response to Site Emergency**

Active forces the IMC off during a site emergency condition.

Inactive allows the IMC to operate normally during a site emergency condition.

- **Network Sequence**

The IMC can be sequenced to other loads in the system or to virtual points. When the IMC is sequenced to another load, its outputs will not activate until the defined sequence state becomes “true.” The following options are offered:

— **Sequence to Loads** defines the executive module’s loads upon which this IMC is dependant.

— **Virtual Points** defines the virtual point(s) upon which this IMC load is dependant.

— **Global** allows IMC operation to be dependent upon loads that exist in the system but are connected to another Lingo. The Lingo and the outputs point(s) must be identified.

- **Phase Loss** is always active. The IMC’s outputs will automatically turn off during a system phase loss condition.
 - **Call Out IMC Alarms**
 - **Yes** allows IMC alarms to report remotely.
 - **No** inhibits (prevents) alarm reporting.
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Novar Custom Language (NCL) Support

NCL commands used with the LSE are provided in the *Novar Custom Language (NCL) Programming Instructions*, Table 1. NCL Commands for Novar's Logic One Equipment.

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