

Installation Instructions: Lennox IMC Interface to E2 BX Building Controller

Overview

All E2 Building Controller (BX) versions 2.21F01 and above have the capability to communicate with Lennox IMC control boards version M4-1 or higher (mounted in Lennox L-series and S-series rooftop HVAC units).

The E2 BX may directly communicate with up to 31 IMC controllers on the IMC's S-Bus network using a special E2 RS485 plug-in network card on the E2 power interface board. The interface allows remote viewing of IMC status information (such as temperature values and the ON/OFF states of fans and stages), set point changes, pass-through of IMC-generated alarms to the E2 Alarm Log, and remote reset of the IMC board.

The Lennox IMC E2 interface is a licensed feature in E2. Licenses are purchased from CPC based on the number of boards the E2 unit will communicate with, and are enabled in the E2 by entering a license key supplied by CPC.

Scope of this Document

This technical bulletin only covers installation and operation details of the **interface** between E2 and the Lennox IMC controller, and *not the Lennox IMC controller itself*. Technical details concerning the installation, programming, and troubleshooting of the IMC are covered in Lennox's own IMC documentation. To request information or receive technical support related to the operation of the Lennox rooftop HVAC units and the IMC itself, contact your local Lennox service representative or call Lennox directly at 1-(800)-953-6669.

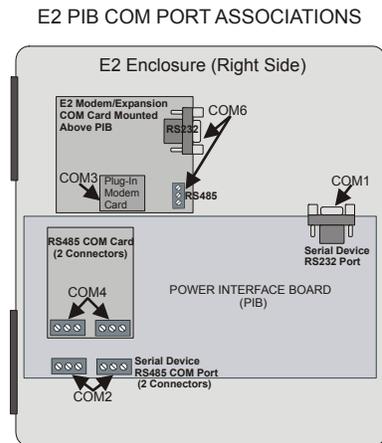
Wiring

NOTE: *The wiring section of this manual covers only the connection of the Lennox IMC S-Bus network to the E2. Refer to your Lennox IMC documentation for all other information, including cable types, IMC hardware diagrams, etc.*

The E2 RS485 Card (E2 version 2.21 only)

Before proceeding, check the firmware revision of your E2 unit by pressing **Alt** + **V** from the E2 front panel. If the version is 2.21F01, the Lennox IMC S-Bus network connection must be made using an E2 RS485 card. If 2.30 or higher, skip these instructions and refer to “The E2 COM Ports (E2 version 2.30 or higher)” on page 3.

In order for an E2 BX version 2.21F01 to communicate with Lennox IMCs, an E2 RS485 card (CPC P/N 637-4890) must be installed in the controller. If ordered along with new E2 units, the E2 RS485 card will come pre-installed; otherwise, the card must be ordered and installed by the customer or OEM.



The board plugs into the E2 Power Interface Board (PIB), located inside the enclosure on the rear mounting plate. **Power down the E2 unit before installing the E2 RS485 card.** Locate the 5x2 connector slot on the left side of the PIB, and plug the E2 RS485 card into this slot. The mounting holes at the bottom of the card should align with the plastic stand-offs protruding through the PIB. Use the supplied mounting screws to secure the card against the PIB.

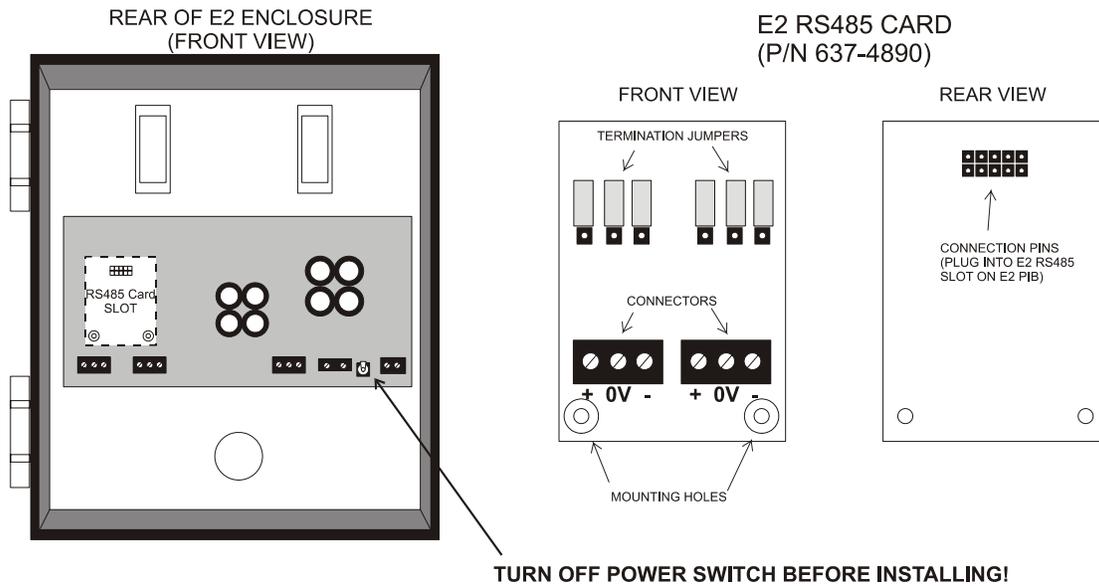


Figure 1 - NCI 485 Card - Mounting Location and Installation

Connect the Lennox IMC S-Bus network cable to one of the connectors on the E2 RS485 card. The E2 should be at the end of the S-Bus daisy chain. The polarity of the E2 RS485 network ports is opposite that of the Lennox IMC controllers; you must connect the wire used to interconnect the negative “-” terminals of the IMC to the positive “+” terminal on the E2, and the “+” terminals on the IMCs to the negative “-” terminal on the E2 (see Figure 2).

Connect the shield wire of the network cable to the 0V terminal on the E2 RS485 connector.

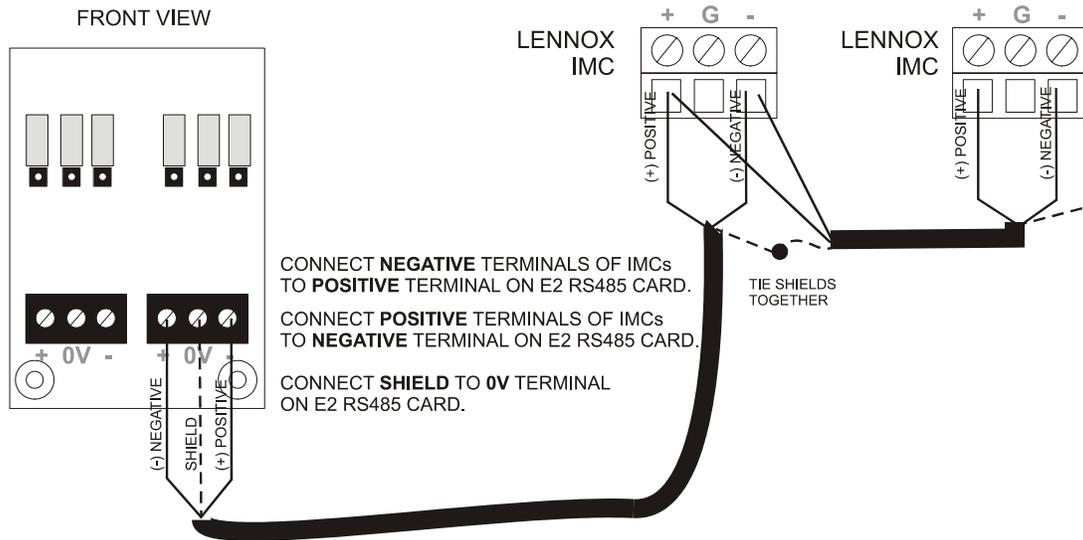


Figure 2 - S-Bus Network Wiring

The E2 COM Ports (E2 version 2.30 or higher)

In E2 firmware versions 2.30 or higher, the Lennox IMC S-Bus Network can be assigned to any RS485 I/O port on the E2 that is not being used by other I/O devices. This means the Lennox network may be connected to the I/O network connectors on the E2 Power Interface Board (COM2), the RS485 Card that plugs into the Power Interface Board (COM4), or the RS485 port on the Modem/COM Port Expansion Card (COM6).

COM2

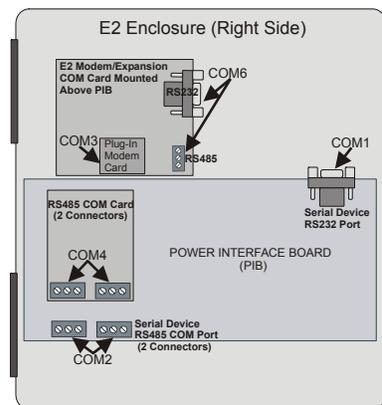
To connect to COM2, wire the network cable to one of the two network connectors. The wire connected to the positive terminals on the IMCs must be connected to the **NEGATIVE (-)** terminal on the COM2 connector. The negative terminals on the IMC must be connected to the **POSITIVE (+)** terminals on the COM2 connector. Connect the shield wire to the 0V terminal. Set the three termination jumpers to the terminated (UP) position.

Note that if COM2 is being used as the Lennox IMC port, no other I/O device types can be connected to the COM2 terminals. MultiFlex I/O boards, Control Link MODBUS devices, and other types of devices will not work if connected to this port.

COM4

If you will be connecting the Lennox IMC S-Bus network to COM4, refer to “The E2 RS485 Card (E2 version 2.21 only)” on page 2 for installation and wiring information.

E2 PIB COM PORT ASSOCIATIONS



COM6

The E2 Modem/COM Expansion Card has a single three-terminal connector on it that may be used as a Lennox IMC S-Bus network port. The wire connected to the positive terminals on the IMCs must be connected to the NEGATIVE (-) terminal on the COM6 connector. The negative terminals on the IMC must be connected to the POSITIVE (+) terminals on the COM6 connector. Connect the shield wire to the 0V terminal. Set the three termination jumpers to the terminated (LEFT) position.

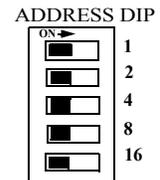
Set Up E2 COM Port (E2 ver. 2.30 and above only)

After connecting the Lennox IMC network cable to one of the E2 COM ports, you must assign the chosen port in the software. Log in to the E2 with level 4 access and press Alt+M (Serial Configuration). Highlight the COM port the Lennox network is connected to, press **F4** - LOOK UP, and select "Lennox" from the Look-Up Table.



IMC Board Numbering

Verify that each IMC board on the network has a unique non-zero address setting on its address DIP switch. The address DIP switches are labeled 1,2,4,8, and 16; the address number is figured by adding together all switches in the ON position. The E2 assumes all IMCs are numbered sequentially; therefore, if you have 7 Lennox IMCs on the network, they must be numbered #1 through #7.



Termination Jumpers

The Lennox S-Bus network requires no termination. Leave the three termination jumpers above the E2 RS485 port set to the UP position.

Setting Up Licensing In the E2

The interface to Lennox IMC units is not a standard feature in the E2 BX building controller. To enable connectivity, a license key must be purchased from CPC to unlock a maximum number of Lennox IMC instances for the BX-300. When the license key is entered, the Lennox IMC interface will be enabled after rebooting the E2.

Obtaining a License Key

To receive a license key for Lennox IMC, contact your CPC sales representative or call customer service at (800) 829-2724. To order a license key, you must provide the following information:

- The MAC address of the E2 BX unit. A MAC address is a twelve-character identifier unique to each E2 unit manufactured. You can read the MAC address from the front panel of the E2 by pressing the ALT+T hotkey combination. New E2 units will also have a sticker with the MAC address printed on it — this will be located on the bottom right corner of the processor board.

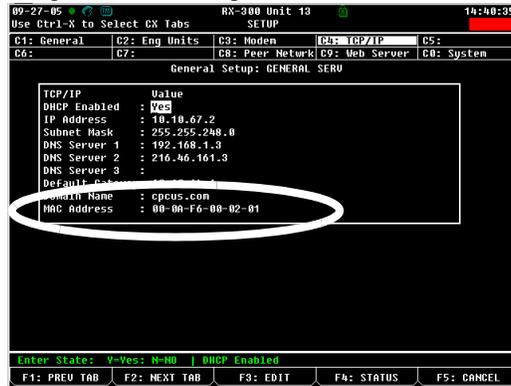


Figure 3 - MAC Address on TCP/IP Screen

- The number of Lennox IMCs the E2 BX will be communicating with. Licensing fees for the Lennox IMC interface are based on the number of IMCs enabled.

When a license order is fulfilled, you will be given a sixteen-character license key. You must enter this key on the E2 License Manager screen.

Entering the License Key

Log into the E2 controller with level 4 access, and press **Menu** **& 7** **(9** to navigate to the License Report screen.

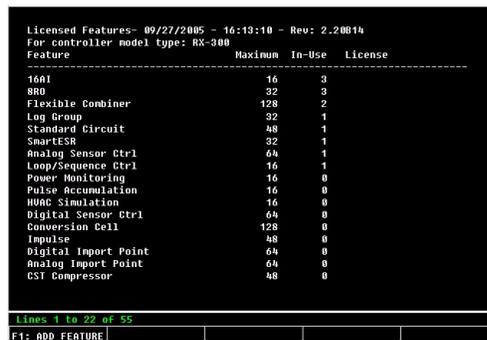


Figure 4 - License Report Screen

From this screen, you can see all the different application types that are licensed in the box. Most of the licenses here are defaults that are enabled for all BX model types. Application types that require licensing and that have already been licensed will be shown in this list along with the license key that enabled it.

In new BX units that have no Lennox IMCs licensed in them, Lennox IMC will not appear in the Feature list until the correct license key is entered. To enter the license key from this screen, press

F1 and enter the license key. If entered correctly, the message “Feature Activated” will be shown (Figure 5).



Figure 5 - Entering the License Key

When activated, press to return to the License Report screen. You should be able to see the newly added Lennox IMC instances. The amount shown in the Maximum field should be equal to the number of purchased licenses.

Adding and Configuring Controllers

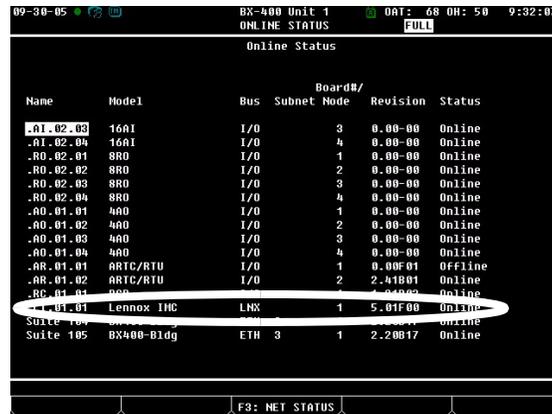
After licensing is properly set up for Lennox IMCs, they must be added to E2 the same way boards and unit controllers are added: from the Connected I/O screen. Press to access the Connected I/O screen, and enter the number of Lennox IMCs on the network in the Lennox IMC field. (Figure 6).



Figure 6 - E2 Connected I/O Screen

Once you enter the number of Lennox IMCs, the E2 will attempt to make connection with IMCs over the S-Bus network. You can check the status of the Lennox IMC connections from the E2 Online Status screen (). This screen will list all the Lennox IMCs you added, starting with board address #1 (displayed in the column labeled “Node”) and continuing in sequence. If one or more IMCs are reporting Unknown, check network wiring and refer to your Lennox IMC documentation for network troubleshooting instructions.

If the Status of the Lennox IMCs reads “No Port,” it means no COM port in E2 has been designated as the Lennox COM port. Refer to “Set Up E2 COM Port (E2 ver. 2.30 and above only)” on page 4.



```
09-30-05  BX-400 Unit 1  DAT: 68 0H: 50  9:32:07
ONLINE STATUS  FULL

Online Status

Name      Model      Bus  Subnet  Node  Revision  Status
-----
-R1.02.00  1601      1/0      3      0.00-00  Online
-R1.02.04  1601      1/0      4      0.00-00  Online
-R0.02.01  880       1/0      1      0.00-00  Online
-R0.02.02  880       1/0      2      0.00-00  Online
-R0.02.03  880       1/0      3      0.00-00  Online
-R0.02.04  880       1/0      4      0.00-00  Online
-R0.01.01  440       1/0      1      0.00-00  Online
-R0.01.02  440       1/0      2      0.00-00  Online
-R0.01.03  440       1/0      3      0.00-00  Online
-R0.01.04  440       1/0      4      0.00-00  Online
-RR.01.01  ARTC/RTU  1/0      1      0.00F01  Offline
-RR.01.02  ARTC/RTU  1/0      2      2.41B01  Online
-RC.01.01  000       1/0      1      0.00000  Online
-LN.01.01  Lennox IMC  LNX      1      5.01F00  Online
Suite 104  Online
Suite 105  BX400-Bldg  ETH  3      1      2.20017  Online

F3: NET STATUS
```

Figure 7 - Lennox IMC Entry in Online Status Screen

Associating a Lennox IMC with a Zone

If desired, a Lennox IMC can be associated with an E2 HVAC Zone application. Association with an HVAC Zone allows an IMC to work in conjunction with other IMCs (as well as CPC controllers and applications such as MultiFlex RCBS, RTUs, and AHU applications) to maintain temperature in a large area.

Associating a Lennox IMC with a Zone automatically ties certain I/O points of the Lennox IMC application with the HVAC Zone application. Specifically:

- The Space Temperature output is tied to one of the HVAC Zone’s Zone Temp inputs, so that the zone can combine all associated controllers’ space temperature values into a single zone temp.
- All occupied and unoccupied heating, cooling, and dehumidification setpoint inputs for the Lennox IMC are tied to the HVAC Zone (i.e. the Lennox IMC will use the HVAC Zone’s temperature and dehumidification setpoints).
- The Zone RH Input for the Lennox IMC is tied to the Zone Humidity Output (in E2 version 2.21 and above).
- The occupancy status input for the Lennox IMC is tied to the occupancy status output of the HVAC Zone (i.e. the Lennox IMC will follow the same occupancy schedule as the HVAC Zone).

Configuring the Lennox IMC to Work with E2

Once the Lennox IMC is on-line and (if desired) associated with an HVAC Zone application, you must change two ECTO parameters in each Lennox IMC to make the IMC work properly with E2. Refer to the IMC documentation for instructions on how to change ECTO parameters.

1. **Parameter 6.01 - System_Mode:** This parameter determines what backup temperature sensor will be used for control if the local “space” temperature sensor fails. Set this parameter to “3”. This will instruct the IMC to use the return air sensor as a backup.

- Parameter 5.24 - Min_Damper_Pos:** This parameter determines the economization damper's minimum position. By default, this is set to "101" which relinquishes control of the minimum damper position to the potentiometer on the IMC board. E2 passes down the minimum damper position to the IMC programmatically. Set this field to "0" to allow E2 to set the IMC's minimum damper position.

Viewing Status and Configuration

You can view the status of a Lennox IMC from the E2 front panel by pressing   to access the Configured Applications list, then choosing "25. Lennox IMC". If you have more than once Lennox IMC, a Summary Screen will be shown listing all Lennox IMCs and their current zone temperatures, modes of operation, fan and occupancy states, and error status. Using the up and down arrow keys, highlight the Lennox IMC you wish to view, and press .

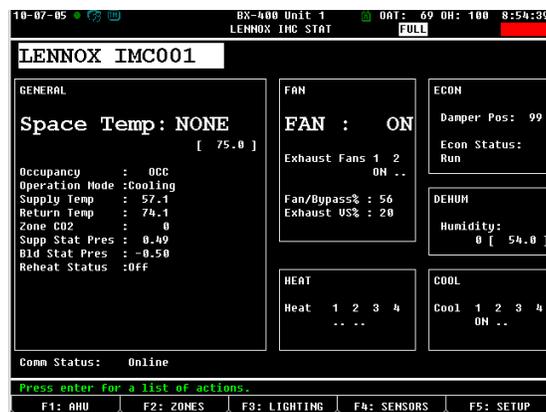


Figure 8 - Lennox IMC Status Screen

The status screen shows specific details regarding all sensors and devices on the Lennox rooftop unit, including temperatures, fan states, heating and cooling stage states, fan speeds, and economization damper settings. You may perform other actions from the Lennox IMC status screen to obtain even more information about various inputs and outputs.

NOTE: The Lennox IMC does not allow output overrides (such as heats and cools) to be made from the E2.

Viewing Logs and Graphs

If an input or output is being logged by the E2, you may view a tabular log or graph of the logged data by highlighting the property you wish to view and pressing . If a log exists, there will be

options in the Actions Menu for “Graph” and “Log” (see *Figure 9*). Select one of these to view a graph or log of the data.



Figure 9 - Lennox IMC Actions Menu (Graph and Log)

Resetting the IMC Controller and Clearing the IMC Diagnostic Buffer

You may reset the IMC controller or clear the IMC’s diagnostic buffer from the Lennox IMC Status screen by pressing **Enter** to view the Actions Menu and selecting “9. Application Commands.” From this menu, you can choose option 1 to reset the IMC controller or 2 to clear the IMC’s diagnostic buffer (*Figure 10*).

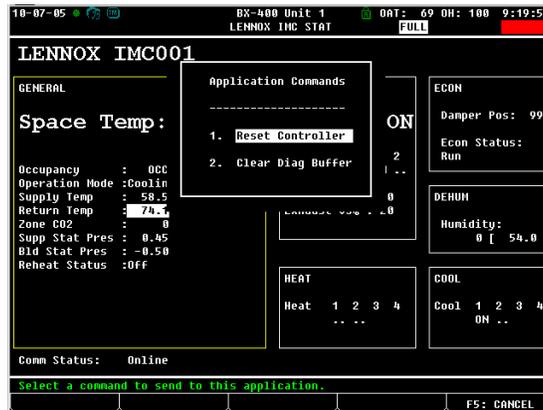


Figure 10 - Lennox IMC Application Commands

The **Reset Controller** option reboots the IMC and clears all lockout conditions. The **Clear Diag Buffer** causes all alarms in the IMC’s alarm buffer to return to normal. This does NOT reset or clear the alarms in the E2’s Advisory Log (this must be done in the E2 Advisory Log screen).

Using E2 Sensor Inputs with Lennox IMC Boards (v. 5.02 or Higher)

If the Lennox IMC board is version 5.02 or higher, you may choose to send input values from the E2 up to the IMC(s) for zone temperature, CO2 (IAQ), and/or indoor humidity. You may wish to do this if you are using a combination of multiple temperature sensors to determine zone temperature, or if you wish to use one CO2 and indoor humidity sensor for multiple IMCs.

To make an IMC use E2’s sensor values:

1. Press **Menu** **5** to access the Configured Applications list.
2. Choose “25. Lennox IMC”, and (if multiple IMCs are used) highlight the IMC you wish to configure and press **Enter**.
3. From the IMC Status Screen, press **F5** (SETUP) and then press **F2** (NEXT TAB) to move over to the Inputs tab of the Lennox IMC setup screens (*Figure 11*).

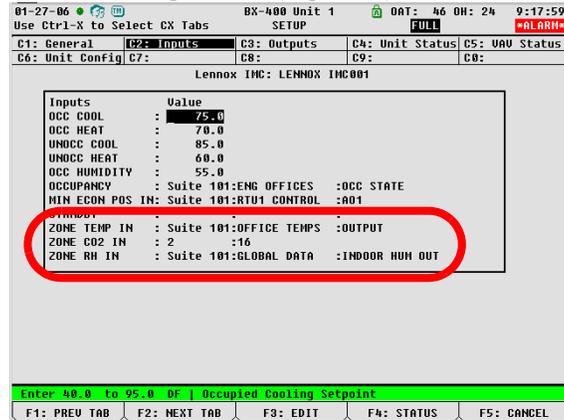


Figure 11 - Lennox IMC Setup Screens (Inputs Tab)

4. If the Lennox IMC board is version 5.02 or greater, three input definitions (ZONE TEMP IN, ZONE CO2 IN, and ZONE RH IN) will appear at the bottom of this screen. Use these input definitions to define the sources for the zone temperature, CO2 sensor, and relative humidity sensor to be used by the IMC. You may define them using:
 - An output from another E2 application. Enter the controller, application name, and output to be used in the Controller, Application, and Output fields respectively, or
 - An input board point directly (with the cursor highlighting a field in the input definition, press **F3**, **1**, **1** to change to a Board/Point style input definition, and then enter the board and point number of the sensor to be used.
 - If an input type will use a local IMC input and not an input from E2, leave its input definition blank.
5. Finally, the IMC must be programmed to accept remote values for its inputs. ECTO parameter 5.27 allows you to specify whether you are using a remote source for zone temperature, IAQ (a.k.a. CO2 level sensor), and indoor RH. Choose the value that enables the remote inputs you are using. Refer to the Lennox IMC documentation for specific information on how to do this.

Alarms

Error codes generated by the Lennox IMC are sent to the E2 and recorded in the Alarm Log (🔔). Lennox IMC alarm messages will include the IMC error code number it corresponds to. Table 1 shows a list of Lennox IMC error codes and their alarm messages.

For further information about error codes and their meaning, consult the Lennox IMC documentation or contact Lennox directly.

WARNING: Lennox IMC error codes are subject to change without notice and may vary depending on IMC firmware version.

Technical Bulletin - Installation Instructions: Lennox IMC Interface to E2 BX Building Controller
Part #: 026-4117 Revision 3 Date: 7/12/2006

Error Code	Alarm Message	Description
1	1 Power loss for two cycles	Low or no power for two consecutive cycles.
2	2 ECTO Access Error	May indicate a problem with the ECTO memory chip and parameters may not be changeable.
4	4 A17 Input - smoke alarm	Smoke detected.
5	5 S52 No blower after demand	No airflow detected 16 seconds after blower turned ON.
6	6 S27 Dirty filter	Indicates a dirty filter.
10	10 24V loss TB35-1 A55 P111-11	24V power is lost at TB35-1 on A55 (M1) board. P111 pin 11.
11	11 24V loss TB34-1 A55 P113-1	24V power is lost at TB34-1 on A55 (M1) board. 113 pin 1.
12	12 S4 High Pressure 1 open	S4 (High Press. 1) is open. Note: on Heat Pump 088S units, S4 or S5 (comp. discharge temp) is open.
13	13 S4 High Pressure 1 open 3time	S4 (High Press. 1) opened 3 (default) times during demand. The number of times is defined in ECTO 1.12 or 4.14. Note: on Heat Pump 088S units, S4 or S5 (comp. discharge temp) has opened 3 (default) times.
14	14 S7 High Press 2 open	S7 (High Press. 2) is open.
15	15 S7 High Press 2 open 3time	S7 (High Press. 2) opened 3 (default) times during demand.
16	16 S28 High Press 3 open	S28 (High Press. 3) is open.
17	17 S28 High Press 3 open 3time	S28 (High Press. 3) opened 3 (default) times during demand.
18	18 S96 High Press 4 open	S96 (High Press. 4) is open.
19	19 S96 High Press 4 open 3time	S96 (High Press. 4) opened 3 (default) times during demand.
20	20 A42 input open A55 P110-9	A42 input is open on A55 (M1) board P110 pin 9.
21	21 A42 input open 3 times	A42 input has opened 3 (default) times.
22	22 S87 Low Pressure 1 open	S87 (Low Press. 1) is open.
23	23 S87 Low Press 1 open 3 time	S87 (Low Press. 1) opened 3 (default) times during demand. The number of times is defined in ECTO 1.13 or 4.15.
24	24 S87 Low Pressure 2 open	S88 (Low Press. 2) is open.
25	25 S88 Low Press 2 open 3 time	S88 (Low Press. 2) opened 3 (default) times during demand. The number of times is defined in ECTO 1.13 or 4.15.
26	26 S87 Low Pressure 3 open	S98 (Low Press. 3) is open.
27	27 S98 Low Press 3 open 3 time	S98 (Low Press. 3) opened 3 (default) times during demand. The number of times is defined in ECTO 1.13 or 4.15.
28	28 S87 Low Pressure 4 open	S97 (Low Press. 4) is open.
29	29 S97 Low Press 4 open 3 time	S97 (Low Press. 4) opened 3 (default) times during demand.
32	32 S49 Frzstat 1 open	S49 Freezestat 1 is open.
33	33 S49 Frzstat 1 open 3 time	S49 Freezestat 1 has opened 3 (default) times during a demand. The number of times is defined by ECTO 4.04.
34	34 S50 Frzstat 2 open	S50 Freezestat 2 is open.
35	35 S50 Frzstat 2 open 3 time	S50 Freezestat 2 has opened 3 (default) times during a demand.
36	36 S53 Frzstat 3 open	S53 Freezestat 3 is open.
37	37 S53 Frzstat 3 open 3 time	S53 Freezestat 3 has opened 3 (default) times during a demand.
38	38 S95 Frzstat 4 open	S95 Freezestat 4 is open.
39	39 S95 Frzstat 4 open 3 time	S95 Freezestat 4 has opened 3 (default) times during a demand. The number of times is defined by ECTO 4.04.
40	40 Return Air above heat limit	Return air temperature (RT 16) exceeded heating limit.
41	41 Return Air below cool limit	Return air temperature (RT 16) exceeded cooling limit.
44	44 GasValve 1 energized/no dmd	Gas valve 1 is energized but no demand. (GV1).
45	45 GasValve 2 energized/no dmd	Gas valve 2 is energized but no demand. (GV2).
46	46 No 24VAC on A60 board K9-5	Second heat section off.
47	47 No relay power A58 TB35-1	Second heat section off.
48	48 No relay power A61 TB34-1	Second compressor off.

Table 1 - IMC Error Codes and E2 Alarm Messages

Error Code	Alarm Message	Description
49	49 No relay power A59 TB35-1	Third and fourth compressor off.
50	50 Pri heat limit open	Gas unit: S10, S130, or S131 (Primary Heat Limit) is open. Other Units: Jumper is open. A55 P111 pin 1 & 2.
51	51 Pri heat limit open 3 times	Gas unit: S10, S130, or S131 (Primary Heat Limit) has opened 3 (default) times during a demand. Other Units: Jumper is open. A55 P111 pin 1 & 2. First heat section is OFF.
52	52 Sec heat limit open	Gas unit: S21 (Secondary Heat Limit 1) is open. Other units: Jumper is open. A55 P111 pin 1 and 2.
53	53 Sec heat limit open 3 times	Gas unit: S21 (Secondary Heat Limit 1) has opened 3 (default) times during a demand. Other units: Jumper is open. A55 P111 pin 1 & 2. First heat section is OFF.
54	54 S47 or S15 open	Gas unit: S47 (Roll Out) is open. Other units: S15 (El. Heat Limit) is open. First heat section is OFF.
55	55 S47 or S15 open during dmd	Gas unit: S47 (Roll Out) opened 1 (default) time during demand. Other units: S15 (El. Heat Limit) has opened 1 (default) time during a demand. First heat section is OFF.
56	56 S18 or S63 open	Gas unit: S18 (Combustion Air Proof Switch 1) is open. Other units: S63 (El. Heat Limit) is open. First heat section is OFF.
57	57 S18 or S63 open 3 times	Gas unit: S18 (Combustion Air Proof Switch 1) has opened 3 (default) times during a demand. Other units: S63 (El. Heat Limit) has opened 3 (default) times during a demand.
58	58 GV1 not energized.	Gas valve 1 not energized two minutes after thermostat demand. (GV1)
59	59 GV1 not energized 3 times	Gas valve 1 not energized 3 (default) times (2 minutes after a demand) (GV1)
60	60 S99 open	S99 (Primary Heat Limit 2) is open. Second heat section OFF.
61	61 S99 open 3 times	S99 (Primary Heat Limit 2) has opened 3 (default) times during a demand. Second heat section OFF.
62	62 S100 open	S100 (Secondary Heat Limit 2) is open. Second heat section OFF.
63	63 S100 open 3 times	S100 (Secondary Heat Limit 2) has opened 3 (default) times since during a demand. Second heat section OFF.
64	64 S69 open	S69 (Roll Out Switch 2) is open. Second heat section OFF.
65	65 S69 open 3 times	S69 (Roll Out Switch 2) has opened 3 (default) times since during a demand. Second heat section OFF.
66	66 S45 open	S45 (Combustion Air Proof Switch 2) is open. Second heat section OFF.
67	67 S45 open 3 times	S45 (Combustion Air Proof Switch 2) has opened 3 (default) times since during a demand. Second heat section OFF.
68	68 GV2 not energized	Gas valve 2 not energized two minutes after demand (GV3).
69	69 GV2 not energized 3 times	Gas valve 2 not energized 3 (default) times (2 minutes after demand) (GV3).
74	74 Zone sensor (A2) problem	IMC's zone temp sensor is bad or disconnected.
75	75 OAT (RT17) sensor problem	Outdoor air temp sensor is bad or disconnected. IMC defaults to a high outdoor temperature operation.
76	76 RH (A91) sensor problem	RH sensor is bad or disconnected. No reheat.
77	77 Supply (RT6) sensor problem	Supply temp sensor is bad or disconnected. No free cooling. Economizer damper will close. All economizer modes. No FAC or FAH.
78	78 Return(RT16) sensor problem	Return temp sensor is bad or disconnected. No free cooling if economizer is in TMP (temperature) mode, dampers will be closed.

Table 1 - IMC Error Codes and E2 Alarm Messages

Error Code	Alarm Message	Description
79	79 Comm error-lock out	Major comm error between the main IMC board and add-on boards. Alarm can be caused by multiple GP1 (A133) boards set to the same mode. This alarm has nothing to do with communication between E2 and the IMC. When this alarm occurs, the main board will reset communications with the add-on boards.
80	80 Comm error-reset	A communication problem between the main board and add-on board has occurred. Alarm can also be caused by multiple GP1 (A133) boards set to the same mode. When this alarm occurs, the main board will reset communications with the add-on boards.
81	81 IMC config error	IMC config error.
82	82 Reset or power outage	Main board reset or power outage has occurred.
83	83 IMC config error	Check UNIT DIP switch setting and add-on board types.
84	84 Comm error-addon board	Add-on board did not respond or is not recognized when polled by main control during system power-up.
86	86 Tstat-heat and cool demands	Thermostat conflict - simultaneous heat and cool demands.
87	87 UNIT dip switch changed	The UNIT (equipment type) DIP switch has changed while unit is energized. Check UNIT DIP switch setting and reset control.
88	88 ECTO chip problem	This may indicate a problem with the ECTO chip. Control will operate on factory ECTO default settings.
89	89 No address set on SW3	No address is set on unit address DIP switch SW3.
90	90 Ram error. System reset	A RAM error caused a system reset.
91	91 Outdoor enthalpy (A7) open	Outdoor enthalpy sensor is bad or disconnected.
92	92 Indoor enthalpy (A62) open	Indoor enthalpy sensor is bad or disconnected.
93	93 System mode changed	The control has changed the system mode because of an error with the controlling sensor or because of a loss of communication.
94	94 Setpoint out of range	The zone sensor setpoint is invalid. IMC will revert to default 65°F (18°C) heating and 80°F (27°C) cooling setpoints.
95	95 ECTO changed by pushbutton	Indicates someone made an ECTO change.
96	96 4 Stg failure A138	Four stage interface failure A138.
97	97 Config error for 4 Stg A138	Four stage interface failure A138.
98	98 ECTO chip write error	ECTO memory chip write error. ECTO settings may not be saved.
100	100 VAV,CAV,etc. config error	VAV,CAV w/bypass damper, or exhaust fan configuration error.
101	101 MGV config error	MGV configuration error.
102	102 GP config error	GP configuration error.
103	103 General config error	General configuration error.
105	105 Economizer config error	Economizer configuration error.
106	106 Building APS A34 problem	Building air pressure sensor is OPEN or SHORT.
107	107 Duct pres A30 problem	Duct air pressure sensor is either OPEN or SHORT.
109	109 Error 107 or 108 3 times	Supply duct pressure errors 107 and 108 have occurred enough times to require unit lock-out.
127	127 Error buffer overflow	The number of errors that occurred has exceeded the IMC alarm buffer, meaning some alarms have not been stored.

Table 1 - IMC Error Codes and E2 Alarm Messages