SERVICE AND APPLICATION NOTES

ACC-17-01
August 1, 2018
Supersedes January 23, 2017

iComfort® Systems Electrical Troubleshooting

AFFECTED UNITS:

iComfort Wi-Fi®, E30, S30 Thermostats using Smart Hub 1.0 and 2.0, Equipment Interface Module, iHarmony® zoning system (DCM) and all Lennox communicating indoor and outdoor units.

OVERVIEW:

The purpose of the service and application note is to address electrical troubleshooting of various connections between iComfort equipment and the applicable expected voltages. Use these voltages to:

- Resolve double dashes on in-zone sensors.
- Determine whether the wire is bad or the device is faulty.
- Determine which wire is bad in the bundle.
- Resolve “missing outdoor unit”.
- Resolve “can’t find iComfort indoor unit”.

DEFINITIONS:

- **Naked** = control has no wires on it at all
- **Loaded** = voltage from **c** to **i-** / **i+** when all four wires are on
- **Landed** = voltage from **c** to **i-** / **i+** without **r** wired on board
- Transformer voltage is specific and best with three decimal places. For example 28.316
  - » Thousandths always bounces and is okay.
  - » Hundredths can bounce but not wide range
  - » Tenths should never bounce

1. If it does almost every time it is a float switch that is breaking **r** to the thermostat
2. Complaint of system waiting
3. History of active alarm codes 105 and 120.
4. Codes not related to equipment
5. Blank screens
6. Wi-Fi will not stay connected.

iComfort® S30 Smart Hub 1.0

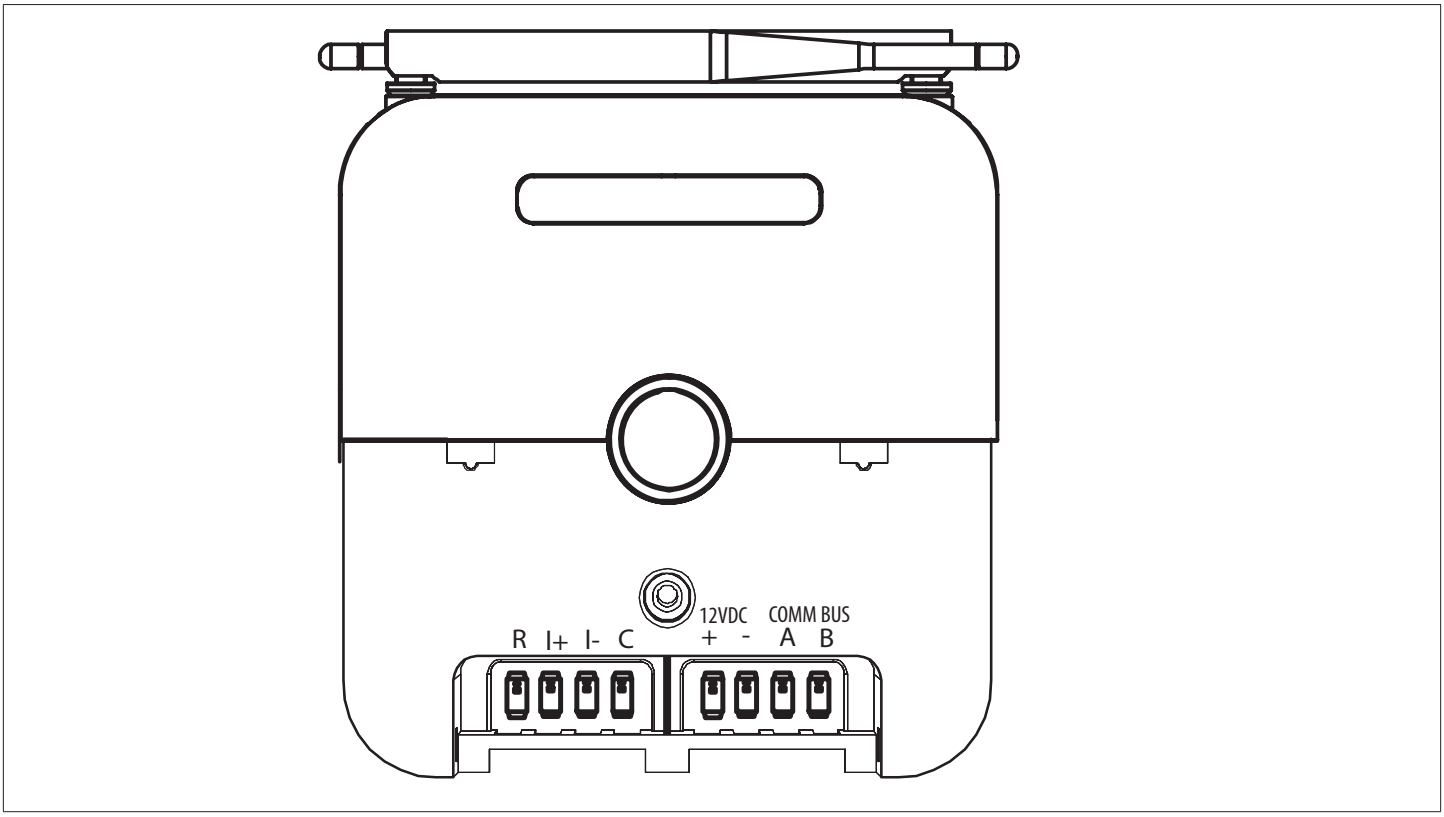

Figure 1. iComfort® S30 Smart Hub 1.0

TESTING:

- **Naked** = Control has no wires on it at all
- **Loaded** = Voltage from **c** to **i-** / **i+** when all four wires are ON
- **Landed** = Voltage from **c** to **i-** / **i+** without **r** wired on control.

Table 1. Most Common Readings (S30 Smart Hub 1.0 Power and Communication Terminals)

Terminals	Naked	Landed
I+ to C	3.5 VDC (I+ naked)	2.5 VDC
I- to C	1.5 VDC (I- naked)	2.5 VDC

Table 2. Most Common Readings (S30 Smart Hub 1.0 Mag Mount Power and Communication Terminals)

Terminals	Voltage Reading
12 VDC + to -	12.4 VDC
12 VDC - to COMM BUS A	1.74 VDC
12 VDC - to COMM BUS B	1.74 VDC

iComfort® E30 and S30 with Smart Hub 2.0

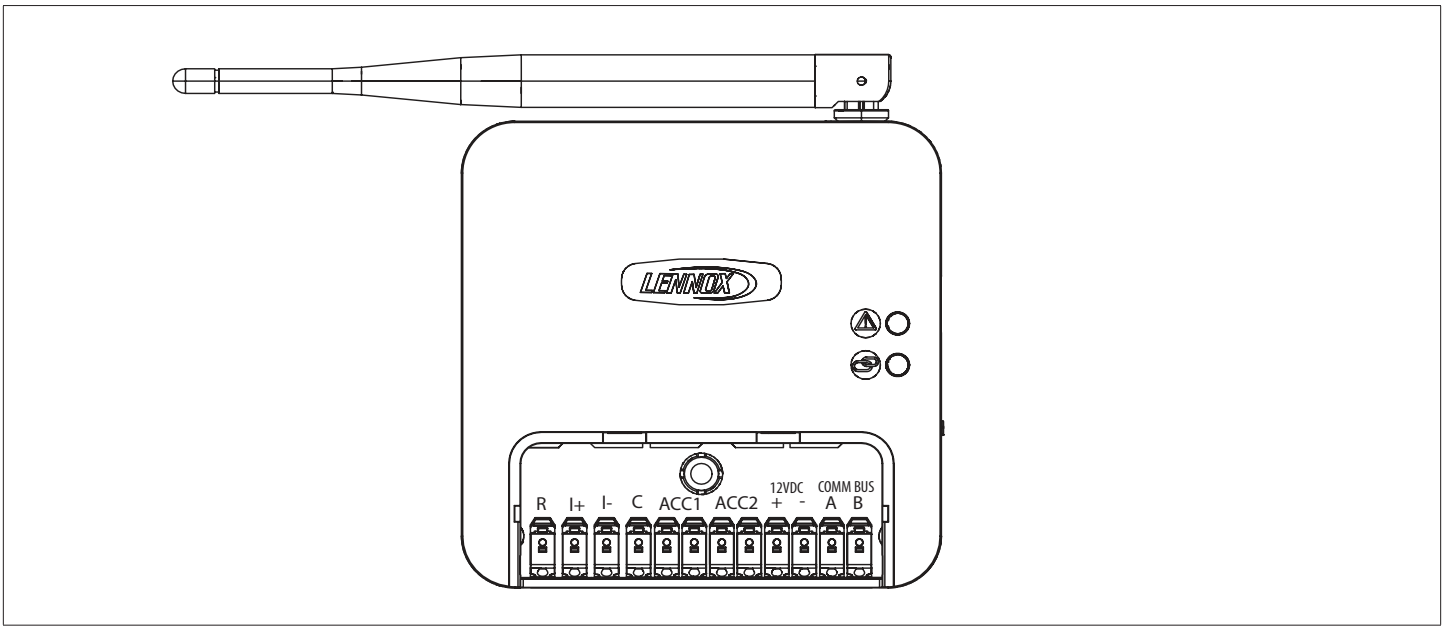

Figure 2. iComfort® S30 Smart Hub 2.0

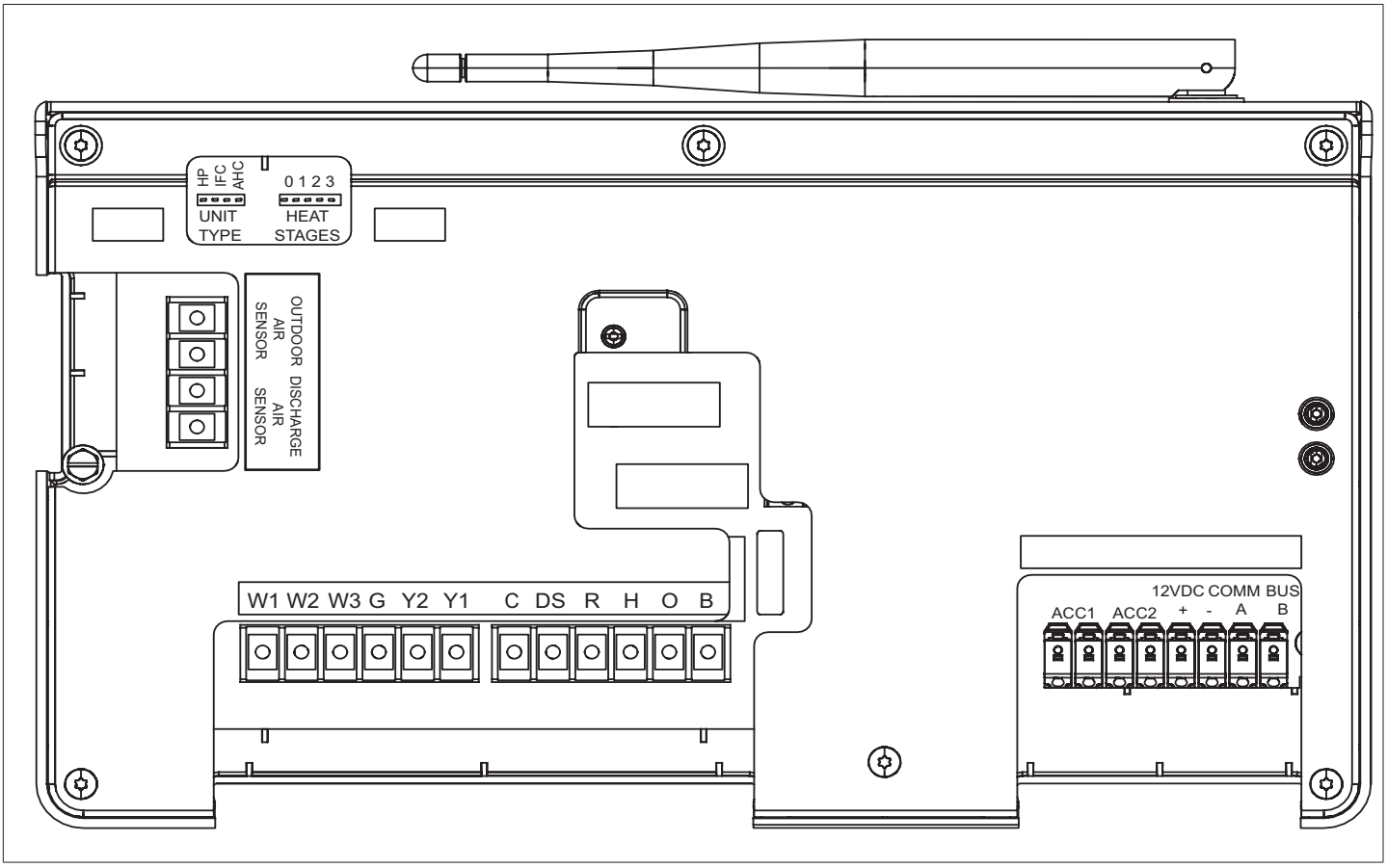

Figure 3. iComfort® E30 Smart Hub

TESTING:

- **Naked** = Control has no wires on it at all
- **Loaded** = Voltage from **c** to **i-** / **i+** when all four wires are ON
- **Landed** = Voltage from **c** to **i-** / **i+** without **r** wired on control.

Table 3. Most Common Readings (E30 and S30 Smart Hub 2.0 Power and Communication Terminals)

Terminals	Naked	Landed
I+ to C	3.5 VDC (I+ naked)	2.5 VDC
I- to C	1.5 VDC (I- naked)	2.5 VDC

Table 4. Most Common Readings (E30 and S30 Smart Hub 2.0 Mag Mount Power and Communication Terminals)

Terminals	Naked	Loaded	Landed
12 VDC + to -	11.68 VDC	11.68 VDC	12.0 VDC
12 VDC - to COMM BUS A	1.67 VDC	1.66 VDC	1.64 VDC
12 VDC - to COMM BUS B	1.58 VDC	1.41 VDC	1.57 VDC

Lennox Communicating Indoor / Outdoor Units and Equipment Interface Module

Table 5. Various Equipment

C to i+ and i- Terminals	Naked	Loaded	Landed
Gas Furnace (IFC)	2.84 VDC	2.615 VDC	1.9 VDC
Air Handlers (AHC)	2.44 VDC	2.5 VDC	1.7 VDC
Equipment Interface Module (EIM)	2.44 VDC	2.4 VDC	1.7 VDC
Outdoor Unit with IFC	0	2.615 VDC	1.9 VDC
Outdoor Unit with AHC	0	2.45 VDC	1.7 VDC

Damper Control Module

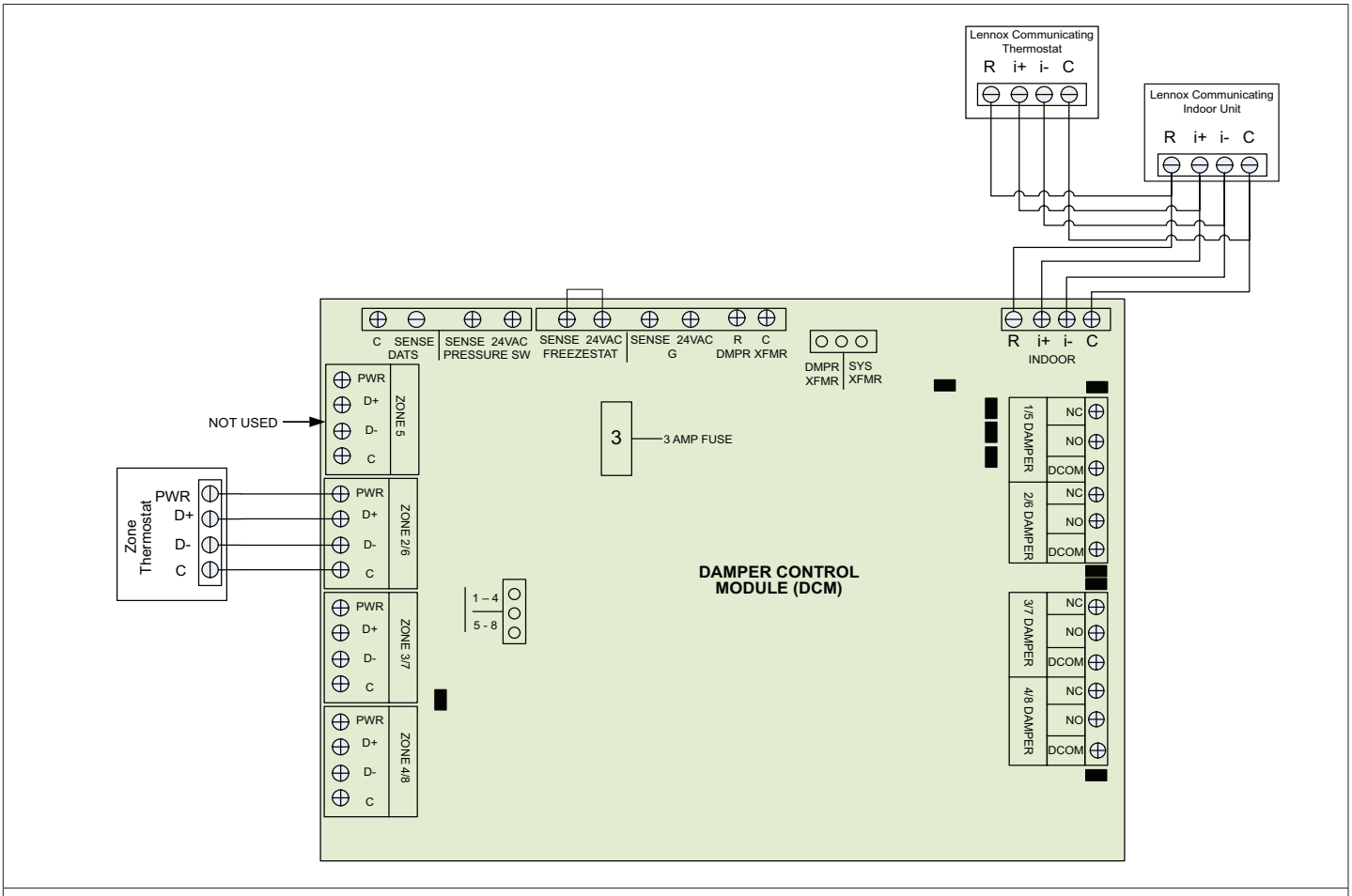

Figure 4. iHarmony® zoning control (DCM)

Table 6. iHarmony DCM C to i+ and i- Terminals (iComfort® Communication and Power)

DCM C to i+ and i- Terminals	Naked	Loaded	Landed
DCM with IFC	N/A	2.615	1.9
DCM with AHC	N/A	2.45	1.7

Table 7. iHarmony DCM C to D+, D- and PWR Terminals (DCM with IFC)

DCM C to D+, D- and PWR Terminals	Naked	Loaded	Landed
C to d-	2.5	2.497	1.8
C to d+	2.5	2.497	1.8
C to pwr	12.43	12.43	N/A
NOTE: *IFC d-/d+ will be .1vdc lower than i-/i+*			

Table 8. iHarmony DCM C to D+, D- and PWR Terminals (DCM with AHC)

DCM C to D+, D- and PWR Terminals	Naked	Loaded	Landed
C to d-	2.4	2.4	1.7
C to d+	2.4	2.4	1.7
C to pwr	12.43	12.43	N/A
NOTE: *IFC d-/d+ will be .1vdc lower than i-/i+*			