# 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

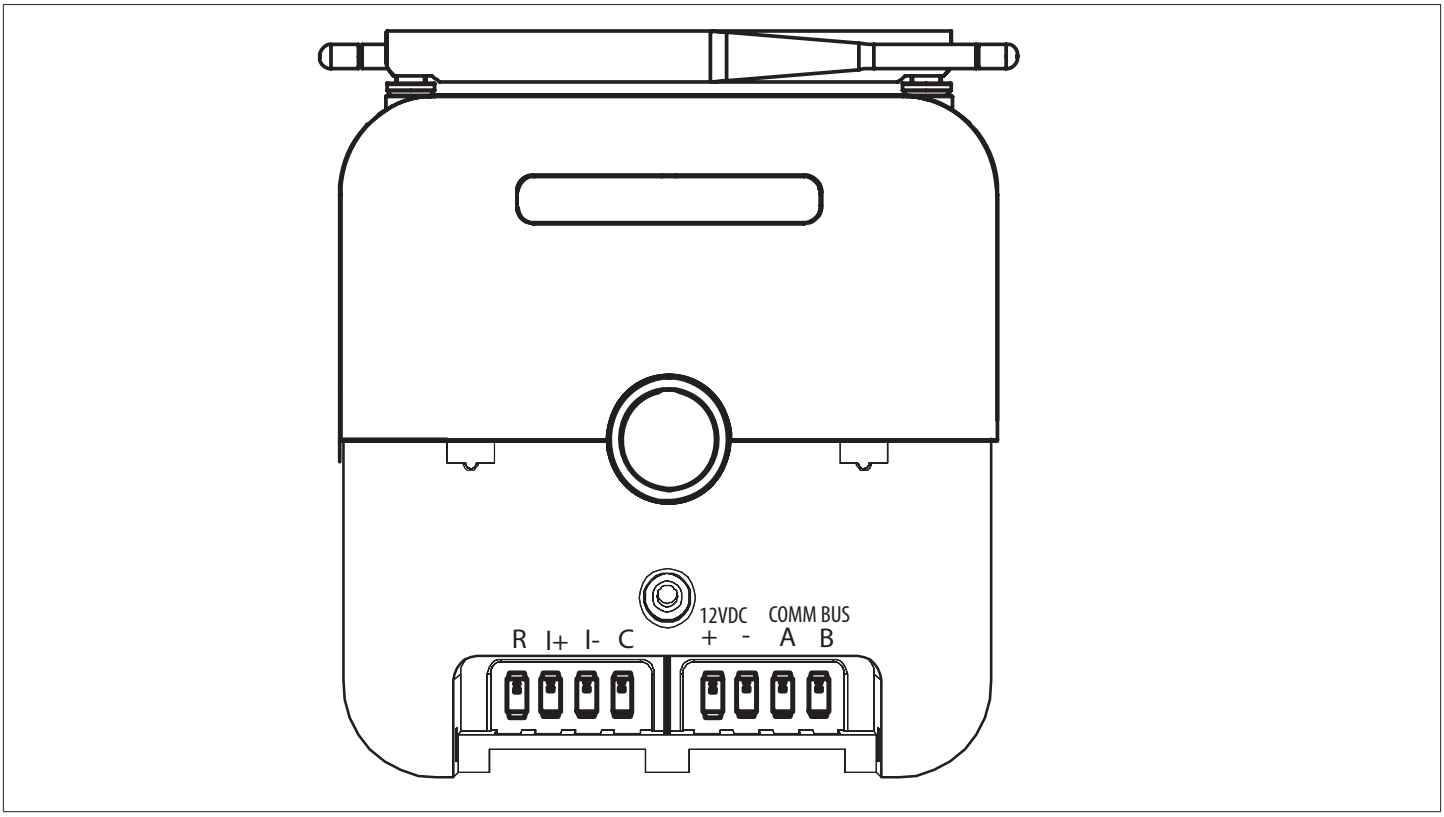


**Figure 1. iComfort® S30 Smart Hub 1.0**

**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

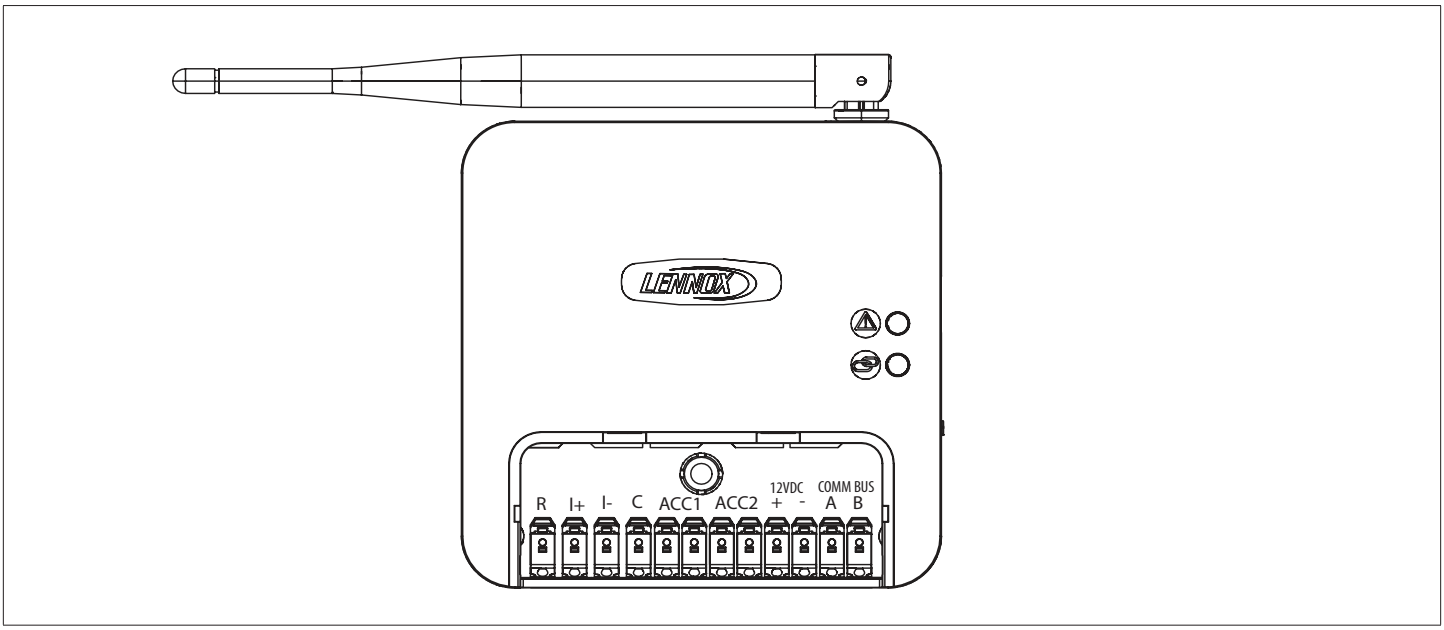


**Figure 2. iComfort® S30 Smart Hub 2.0**

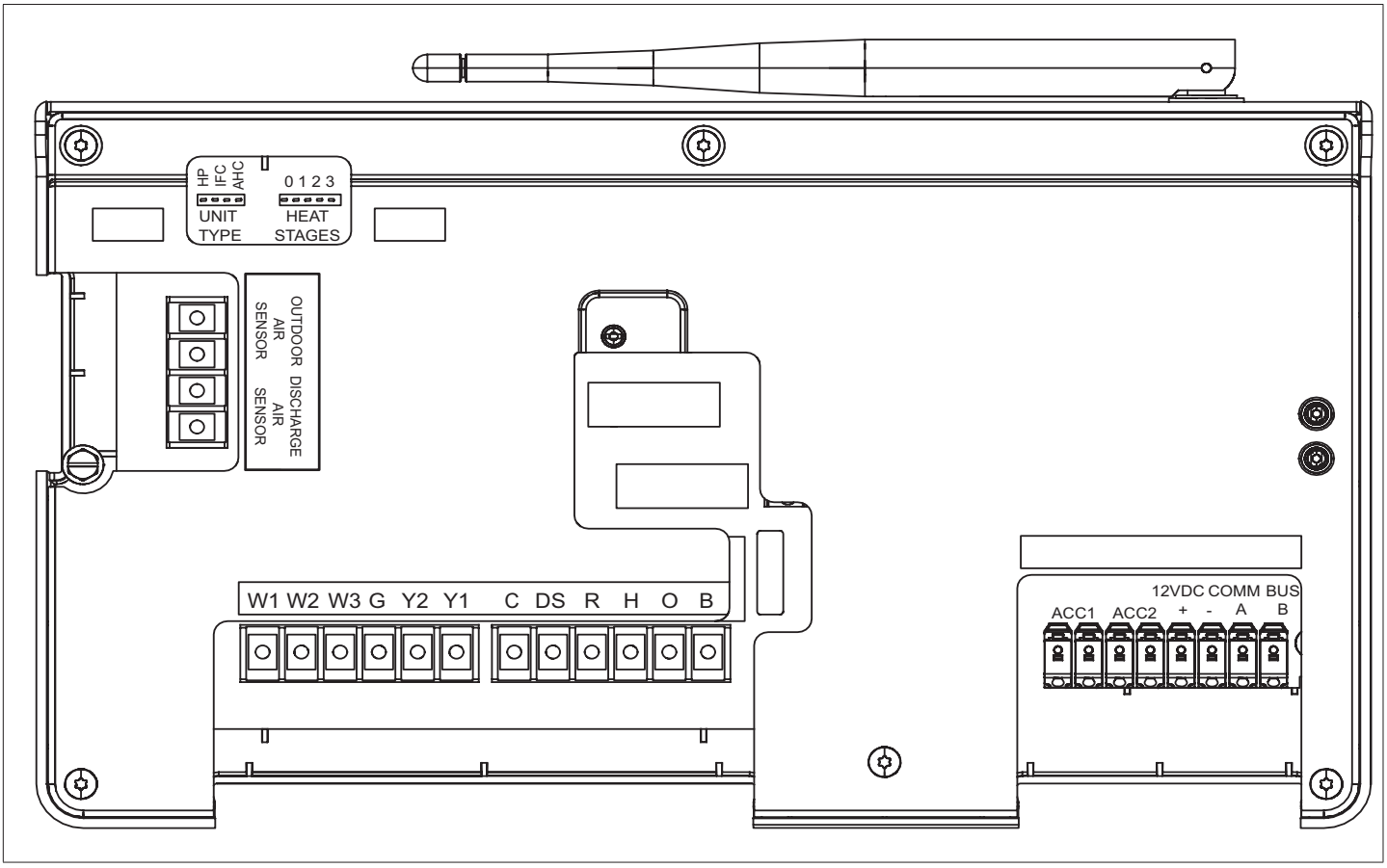


**Figure 3. iComfort® E30 Smart Hub**

**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

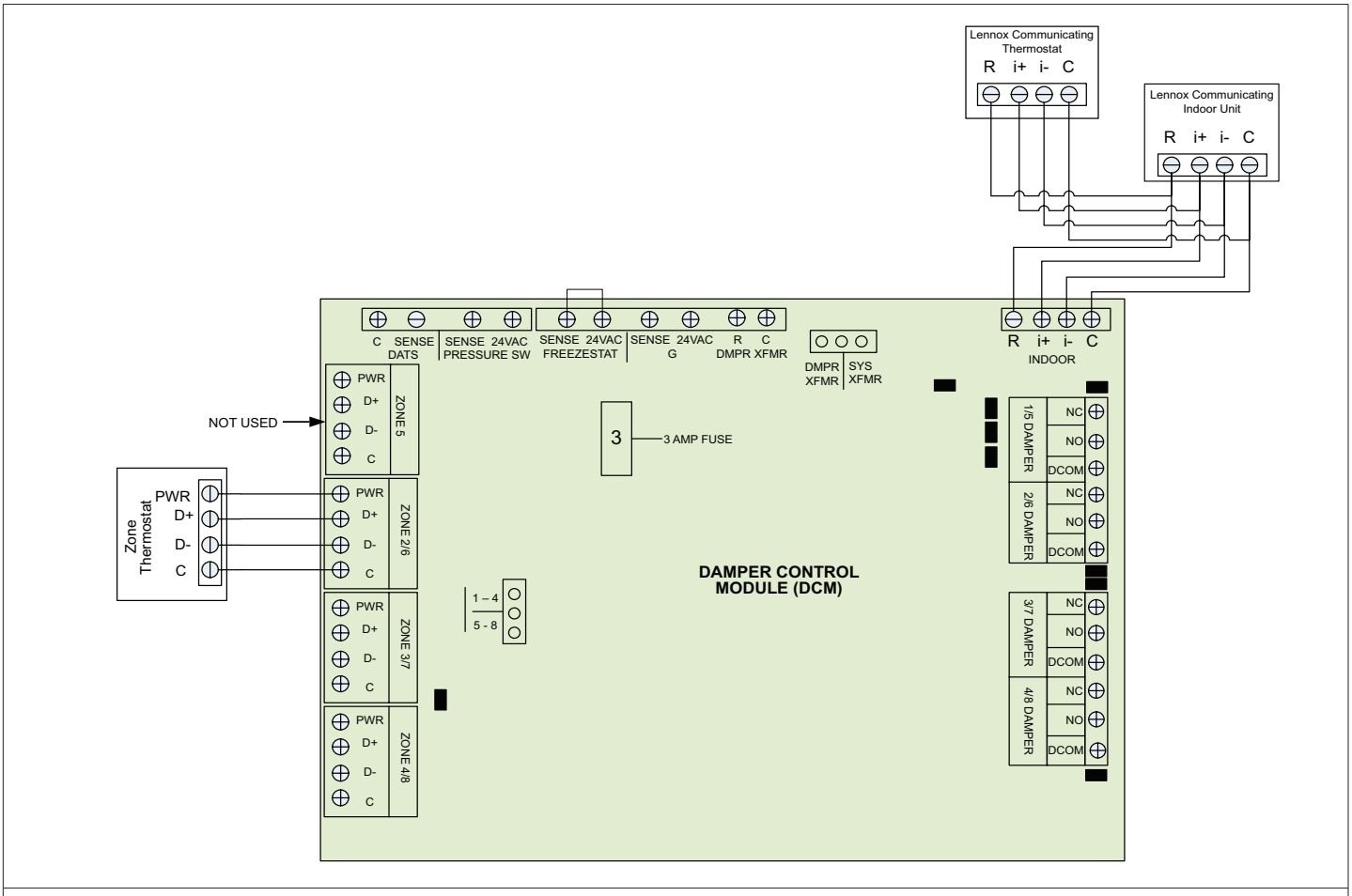


**Figure 4. iHarmony® zoning control (DCM)**

**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+* | | | |