BlackBox Nexus Lite

Installation Manual

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This Install Guide documents the BlackBox Series Nexus Lite

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Sourcing
Proudly designed and manufactured in Australia by Innovative Air Systems Pty Ltd, an independent Australian-owned company.

Product support
Freecall: 1800 354 434 (Australia-wide)

Contents

1 INSTALLATION

1.1 Wiring

All electrical installation is to be carried out by a licensed trades person in accordance with AS3000 and manufacturers connection diagrams.

1.1.1 Device I/O Cabling Requirements

All touchpad and sensor cables should be shielded, and kept the maximum practical distance from any power cables ≥ 240 volts (minimum recommended distance = 300 mm).
Shielded 4 core data cable is acceptable provided the drain is firmly connected by a mechanical means to the SH terminal. The mechanical connection of the earth terminal on the Relay Module to a suitable point enables this shielded cable to function as intended.

1.2 Component Positioning

The Nexus Lite Module can be positioned in the mechanical services switchboard or, on or near the systems air handling unit. Maintain a minimum distance of 300 mm from the indoor fan motor or similar inductive fields.

The External Touchpad should be mounted in a central position within the air conditioned space. It has been designed to be flush mounted to a cavity wall, or surface mounted through the use of a 15 mm mounting block.

The Return Air Sensor should be mounted either, inside the return air duct as close to the return air grille as possible, or wall mounted 1.5 meters from floor level close to the return air grille. Most importantly, the return air/room sensor should always be protected from direct sources of heat such as direct sunlight and office equipment.

The Outside Air Sensor (131E touchpad required) should be protected from direct sunlight, mounted inside the outside air duct as close to the outside air grille as possible.

1.3 Controller Configuration

The Nexus is capable of controlling many different A/C configurations of up to 5 relay outputs. The configuration is dictated by the model number of the touchpad. E.g. Touchpad Model: CC-BB-LCD-311... uses the 311 configuration. See section 1.3 for wiring details.

1.4 Nexus Technical Specifications

Power input to Controller ..... 240 volt ± 10%
Line frequency ..... 50 Hz
Power Consumption ..... 6 VA (max)
Operating temperature ..... 0 °C to 65 °C
Altitude ..... 0 to 2000 meters
Operating Relative Humidity..... 10% to 80%
Unit Dimensions (mm)..... 173 (L) x 116 (W) x 55 (H)
Weight ..... 550 g
Avoid static electricity hazards
Avoid electromagnetic radiation sources
Avoid dust contamination
Avoid highly corrosive environments

1.4.1 Inputs/Outputs

5 x relay outputs
- Max load through all relay terminals is 7Amps (inductive).

1 x digital input
- Flow input. Open circuit = lock out compressor relays.

2 x analogue outputs
- 1 x 0-10 VDC linked to cooling control band - V1
- 1 x 0-10 VDC linked to heating control band - V2

2 x analogue inputs
- 1 x NTC thermistor - 47 kΩ @ 25 °C
- 1 x Multi purpose

1.4.2 Special Inputs

Analogue inputs S1 and S2 provide additional digital inputs in the following manner (voltage free clean contacts required):

- **S2 Closed Circuit = System Fault**
  Close circuit analogue input 2 terminals (S2 and SC) to shutdown all conditioning relays (compressors and electric duct heaters). The fan relay will remain energised only if the system is On.
  For 3 speed fan models in auto fan mode the controller will default to low fan speed. Manual changes to fan speed will be accepted.
- **S1 Closed Circuit = Remote On/Off**
  Close circuit analogue input 1 terminals (S1 and SC) to shutdown all relays.
- **S1 Open Circuit = Forced Vent Mode**
  Open circuit analogue input 1 terminals (S1 and SC) to shutdown all conditioning relays (compressors and electric duct heaters), the fan and reversing valve relays will remain energised. If the system is Off, the relay for the currently selected fan speed will be energised.
  For 3 speed fan models in auto fan mode the controller will default to low fan speed. Manual changes to fan speed will be accepted.

Any connected LCD touchpad will display a message on the screen for each digital input trigger and the service timer trigger.
If multiple trigger events occur at the same time the message displayed is based on the following priority.

1. System Fault
2. Service Timer
3. Remote On/Off
4. Forced Vent

The factory default messages may be replaced by one from the message library via the Advanced Settings Menu.
The library contains one custom entry of 2x8 character lines.

1.4.3 Default Hardware Settings

The following table details the function of the main processor module DIP switches located next to the sensor inputs.

Table 1.4.3a

Main Processor Module DIP Switch Settings

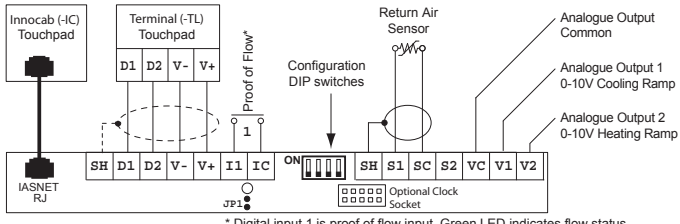
DIP #	Function	OFF (Factory Default)	ON
1	**Compressor Delay**	Software Selectable (4 minute default)	4 seconds max (overrides software)
2	**Memory Lock (Diagnostic Use Only)**	Disabled	Memory locked. Settings changes are discarded.
3	**Restore Factory Defaults**	Disabled	Restore factory defaults at next reboot.
4	**Heat Type**	Reverse Cycle	EDH or Cool Only

1.5 Connection Diagrams

Select the appropriate connection diagram from the following pages.

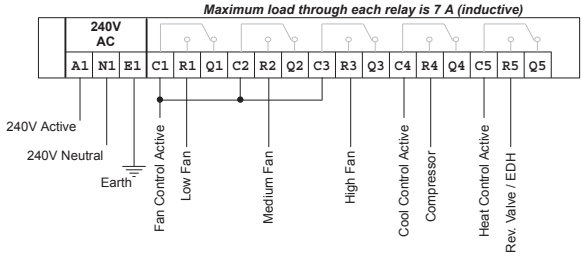
1.5.1 Configuration 311

IASnet RJ and terminals, digital and analogue input / output terminals



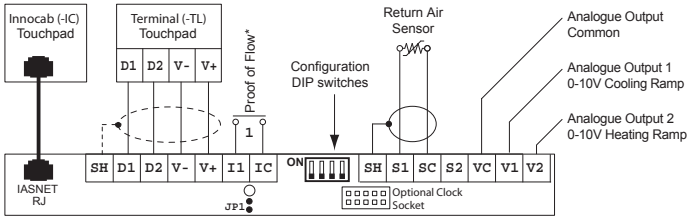
* Digital input 1 is proof of flow input. Green LED indicates flow status.
Flow must be proved before compressor relays are energised.
Short Circuit JP1 for constant flow (short circuit digital input 1).

240VAC Line in and relay output terminals



1.5.2 Configuration 122

IASnet RJ and terminals, digital and analogue input / output terminals



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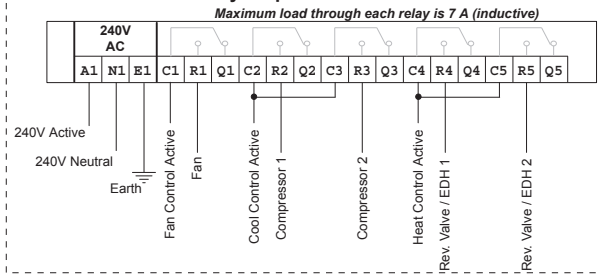

2 COMMISSIONING

2.1 Before connecting 240 VAC power

Verify the the correct wiring diagram has been followed by checking the model number on the touchpad.
Ensure all electrical connections are in accordance with the supplied connection diagrams and local bylaws.
Verify the sensor has been connected as per the connection diagrams in section 1.5.

2.2 Before first run

Set all the system settings as detailed in the touchpad's user guide.

2.3 Power on

Operate the controller in heat, cool and try each fan speed setting.

2.4 Prior to departure

Ensure that the Delay software setting is restored to Safety and verify the hardware delay DIP switch # 1 is returned to the off position prior to finishing commissioning.

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