DXU4 Universal Air Control w/Humidity

SUPERSEDES: New   EFFECTIVE: August 21, 2012

Plant ID: 001-4117

PURPOSE: This guide is a consolidation of important DXU4 information that can be used when installing, commissioning and setting up the controller. It is not meant to replace any other DXU4 documents or drawings.

APPLICATION: The application is for controlling a single zone roof top unit, air handler or split system. The system may have an economizer and/or humidifier and it may perform dehumidification with or without reheat.

IMPORTANT FACTS

- If an economizer is to be controlled based on dry bulb temperature, an ASM2 must be used and it must have an Outside Air Temperature sensor connected.
- If an economizer is to be controlled based on enthalpy, an ASM2 must be installed and have an Outside Air Temperature and humidity sensor connected. The DXU4 must also have either a return air humidity sensor or TS302 or TS304 (zone sensor with humidity option) installed.
- Several controllers can use the same indoor air humidity sensor for enthalpy calculations if the free cooling type is set to global humidity.
- If the fan is not being proved with a differential pressure switch or current switch, then the fan proof input must be jumpered.
- First stage radiant control; the controller can be configured so that the first stage heat serves radiant heat and the fan is kept off until the second stage is enabled.
- There is a 30-second delay after the fan is turned on before the flow proof input is verified.
- When going from unoccupied to occupied mode of operation, the space temperature alarms are delayed 30 minutes.
- When the fan is turned on, there is a delay of 10 minutes before reporting mixed-air temperature alarm.
- When using staged heating or cooling, the stage time setting must be non-zero.
- When using staged heating and cooling, the stage control band must be non-zero.
- Humidification and dehumidification are enabled when their respective setpoints are set to a non-zero number.
- Dehumidification is accomplished by enabling the cooling cycle; there is no dehumidification enable output.

INSTALLER/ELECTRICIAN CHECKLIST

Task	Verified Yes/No
Ensure that the 24VAC power source is properly connected to terminals 38 & 39 and that the polarity is correct.	
Ensure that terminal 40 GND is connected to a known good earth ground.	
Ensure that the 3 sets of DIP switches are properly set in accordance with the drawing below, installation or application documents. The DIP switches can be accessed by removing the controllers cover. Note the black square for each position indicates the direction the switch needs to be placed.	
Ensure that the 4 sets of jumpers are properly set in accordance with the drawing and your application. The jumpers can be accessed by removing the controllers cover.	

Task	Verified Yes/No
Ensure that the proper wire is used for inputs and the communication trunk. Analog input wiring must be 18 AWG TSP (can also use multi-conductor). Taco part # Wir-018 (1 Pair + shield). Communication wiring must be Echelon approved cable 22 AWG TP. Taco part # WIR-022.	
Ensure that the shielded input wiring is properly grounded. Remember the shield must only be connected at the controller end, at the sensor end it should be cut even with the wire jacket and taped.	
Ensure that the sensors required for this application are properly installed and wired to the controller. Refer to sensor and controller installation sheets for reference.	
If the LCI is connected and powered up, press the service pin button on the DXU4 so that the controller is recognized and added to the LCI's database. This can be verified by logging into the LCI. The controller appears as Unit*x*_DXU4, where *x* is the order in which all controllers' service pin buttons have been pressed.	

COMISSIONING THE CONTROLLER

After the DXU4 has had all inputs and outputs properly wired, a point-to-point check should be performed to ensure all terminations have been properly made. Use this checklist to verify all inputs are working correctly and reading properly in the LCI; if a point is not used, simply indicate "not used."

Steps required for verifying inputs on the DXU4

To verify the inputs and outputs, login to the LCI and perform the following steps:

1. Press **Controllers** button from the Home screen.
2. Select the DXU4 from the list of controllers.
3. Press **Inputs** and and verify that there are realistic temperature readings. It is recommended that the temperature sensors be warmed up or cooled down so a response is seen. To verify digital inputs, change the state of the sensor to see a response.
4. Create a group and a schedule on the LCI's home page, then assign the controller to the group by pressing **Members** within the group.
5. Select the DXU4 from the list of controllers and change the override Setpoint to a value that will cause the controller to enter the heating mode; verify the outputs in the outputs page. Remember to verify that the physical equipment has been enabled and disabled accordingly.
6. Now override the setpoint to cause the controller to enter the cooling mode; verify the outputs in the outputs page.
7. To verify the outputs, press **Outputs**.
8. After verification, clear the overridden setpoint.

| Inputs	Verified/initials	Outputs	Verified/initials
Space Temperature		Heat Output	
Smoke Detector		Cool Output	
Fan Status		Economizer Output	
Low Limit		Fan Output	
Filter Status		Reheat Position	
Indoor Air Quality (AI)		Humidification	
Supply Air Temp			
Mixed Air Temp			
Return/Zone Humidity			
Supply Air Humidity			
IAQ (DI)			

CONFIGURING THE DXU4 SETTINGS

A description of DXU4 settings can be found in the Application Guide on page 30-37. If a copy of the Application Guide is needed, it can be found at www.taco-hvac.com. Once in the web site, select the *Products* tab, and from the drop down list select *iWorx® by Taco Electronic Solutions*. A complete list of links to all documentation is shown on the left side of the web page.

TROUBLESHOOTING & TECHNICAL TIPS

Problem	Solution
Controller is not running and Status LED is not illuminated.	No power to controller. Verify the voltage on the controller's power connector (24 VAC).
Fan cycles on for 30 seconds and then turns off.	The controller requires the fan status input to be shorted, normally closed, for proper operation. Ensure that your air flow sensor is working and properly wired to the controller. If you are not using an air flow sensor you must place a jumper between the fan status input and the adjacent common terminal.
The fan will not cycle on after the input has been jumpered or the air flow sensor connected.	If the fan was previously in a fan fault condition, the controller must be reset before proper operation can be restored.
How do I reset the controller?	The controller can be reset by the LCI, or you can cycle power to the controller. Refer to the LCI documentation for more information on resetting the controller using the LCI.
The fan will not cycle on.	There are several reasons the fan may not cycle on, and all should be checked. – Are all digital inputs on the controller (except for the fan status input) normally open and wired accordingly? – Is the controller in an occupied mode? – Has the controller been overridden by the LCI? – Is the smoke detector or mixed air low limit indicator (freeze stat) tripped? If so, correct the problem and the controller will automatically start; a reset is necessary. – Is the thermostat connected?
The fan and heat/cool pilot relays will not come on even though the LCI indicates it is on.	Ensure that the controller and output pilot relay have been powered with 24 VAC and the output has been correctly wired to the coil of the pilot relay. Also ensure that the pilot relay has a 24 VAC coil.
The 10K thermistor reading is at its maximum or minimum.	The input is either shorted or open.
The economizer damper fails to open.	– Was the LCI used to select an economizer type other than 'None'? – Is the difference between indoor and outdoor enthalpy greater than the economizer setpoint? – If "global humidity" is selected, make sure that the ASM is reading a valid humidity and providing it to the network. – Is the OAT above or below the economizer lockout (also cutoff)?
The Heat or Cool outputs will not come on even though the space requires conditioned air.	Is the OAT above the Max OAT Heat setting (lockout) or below the Min OAT Cool setting?
There is an IAQ alarm but the economizer damper is not at 100%.	The space temperature is most likely above or below the space temp +/- IAQ Temp Reset.
The humidifier is not coming on.	– Has the humidity low limit been configured? – Is the current mode heating? The humidifier will only be enabled in the heating mode.
Dehumidification is not being enabled.	– Dehumidification will not be enabled during the heating mode. – Is the controller occupied and is the Space Temperature above the setpoint minus the shutoff offset. Dehumidification will operate during unoccupied mode if the type is configured as always enabled.

TYPICAL DXU4 WIRING

Rooftop Unit - Staged Heating : Staged Cooling : Economizer
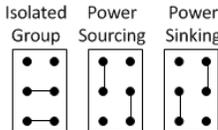'Triac Outputs Wired as Power Sourced'
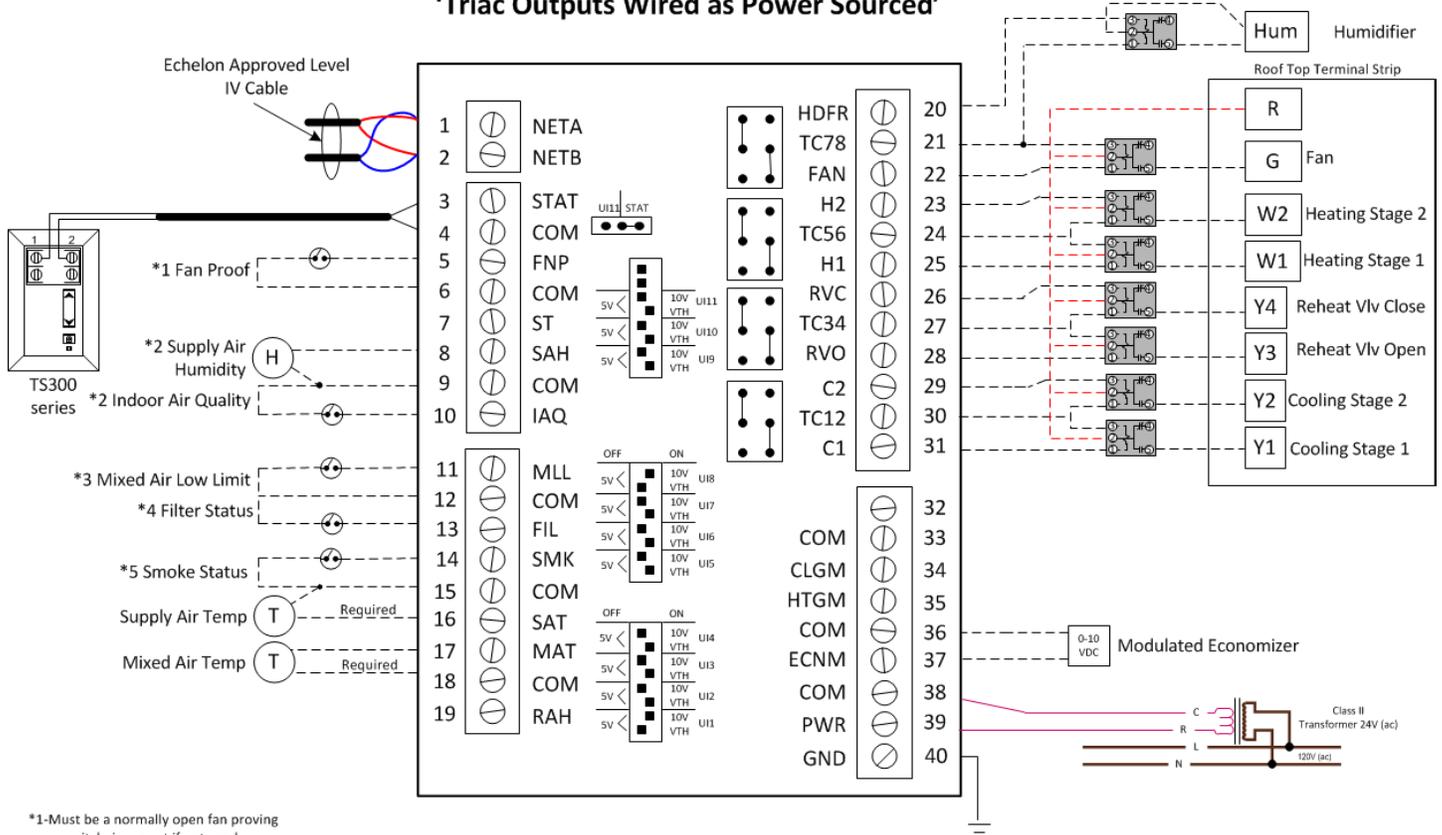
*1-Must be a normally open fan proving switch, jump out if not used.

*2-Can be a 0-10vdc device. Dip switches must be properly configured

*3,4,5-Must be a normally open switch/ device. Do not jump if not used

Symbols

T — 10 K ohm Precon Type III thermistor

24VAC pilot relay or contactor coil

0-10 VDC signal

Output Jumper Positions

| Isolated Group | Power Sourcing | Power Sinking |

Dip Switch Positions

Left-Left is Invalid
Right-Left is 10K or Digital/Switch
Left-Right is 0-10v
Right-Right is 5v

CONTROLS MADE EASY®

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