

# S2UI28-N2S

## Wall-Mount User Interface Terminal JCI N2 Bus Slave Version

### Introduction

The S2UI28-N2S is a wall-mount User Interface terminal that provides information and interaction between the User and a JCI N2 Bus Building Management System's (BMS) Supervisory Controller (NAE, N30, NCM, FX 16/20/40/60, etc).

### Configuration Procedure

It is assumed that you have you have installed the S2UI28-N2S USB drivers. If you have not installed the USB drivers yet, please refer to the S2UI28 USB Driver Installation document.

### S2UI28-N2S Configuration Program Installation

1. Execute the "SetupS2UI28N2S.exe" file located on the included CD. Assuming your CD/DVD drive is drive letter "D", the location of the setup program will be "D:\S2UI28-N2S\ SetupS2UI28N2S.exe".
2. Follow the installation steps and select a suitable installation directory. By default the setup program will install the application in C:\Program Files\S Squared\S2UI28\N2S" directory and will create a Shortcut located "Start-Programs\S Squared\S2UI28-N2S Config"
3. You are done, proceed to Step 4

## S2UI28-N2S Configuration

4. Execute the S2UI28-N2S Configuration program from the “Start-Programs\S Squared\S2UI28-N2S Config” shortcut
5. The first thing you will notice is that the configuration program looks like a S2UI28-N2S device. This is by design in order to accelerate you with learning how to configure the device. The navigation of the various screens operates the same way as the real device in that you press (or in this case you mouse-click) the two lower buttons on the display.



- Now, let us familiarize you with the menus, toolbars, navigation buttons, and field drop-down selection windows.

Under the “File” menu option, you have the standard Windows File functions:

New	New Configuration
Open	Open Configuration
Save	Save Configuration
Save As	Save Configuration to a New File Name
Exit	Close Application

Under the “Options” menu option you have the ability to select which serial port you will be using to communicate with the device. You will only be able to select the COM port and the configuration program will only list found ports. It is very important to power the S2UI28-N2S and then connect the USB cable to your computer first before you run the Configuration program. If not, the Configuration program will not detect the S2UI28-N2S correctly and you will need to close the Configuration program and start again.

Under the “S2UI28” menu option you will find various commands that you will use:

- Locate an attached S2UI28 device
- Upload/download Data Field data
- Upload/download device configuration
- And update the S2UI28’s firmware

Details on the above commands will be given in the respective sections of this document

- Now, let’s get started...Select the “S2UI28-Locate” menu option to locate the S2UI28-N2S device. By default the S2UI28-N2S defaults to a N2 address of 255 and so it will attempt to communicate at this address first. If you received the following message then first select a different COM port for the program under the menu item “Options-Serial Port” and try again.



If you still cannot connect to the S2UI28-N2S, then select a different N2 address either through the tool bar area or within Screen 7.

- If you still cannot communicate with the S2UI28-N2S then unplug and reconnect the USB cable to your computer and check the serial port settings for a update COM port within the list. If you are still having troubles at this point, please call us for support.

9. Now, assuming that you received the following message we can continue the configuration:



### Configuring the S2UI28-N2S's Data Fields

Configuring the data fields is quite simple and yet provides a lot of flexibility with regards to how you wish for the data to be displayed and/or controlled on the display. For example you can display the data as a numeric value or as an enumerated string with or without the ability for a User to control this data. Each Data field within the device (15 data fields maximum) has the following parameters:

#### Screen Label of the Data

Tagname	Data Label (19 characters max)
Tagname Color	Selectable by drop list (custom colors can be requested)

#### Displayed Data

Enable Data Field	Check Box to Display Data Field
Units	Data Units to be displayed (3 characters Max)
Data Field Color	Selectable by drop list (custom colors can be requested)
Decimal Places	Selectable from 0 to 3 decimal places

#### User Editable Data

When enabled, this allows the user to control the data between the minimum and Maximum values by the increment

User Editable	Check Box to allow User to Edit Data Field
Minimum Value	User's Minimum Value Range
Maximum Value	User's Maximum Value Range
Increment	User's adjustment increment

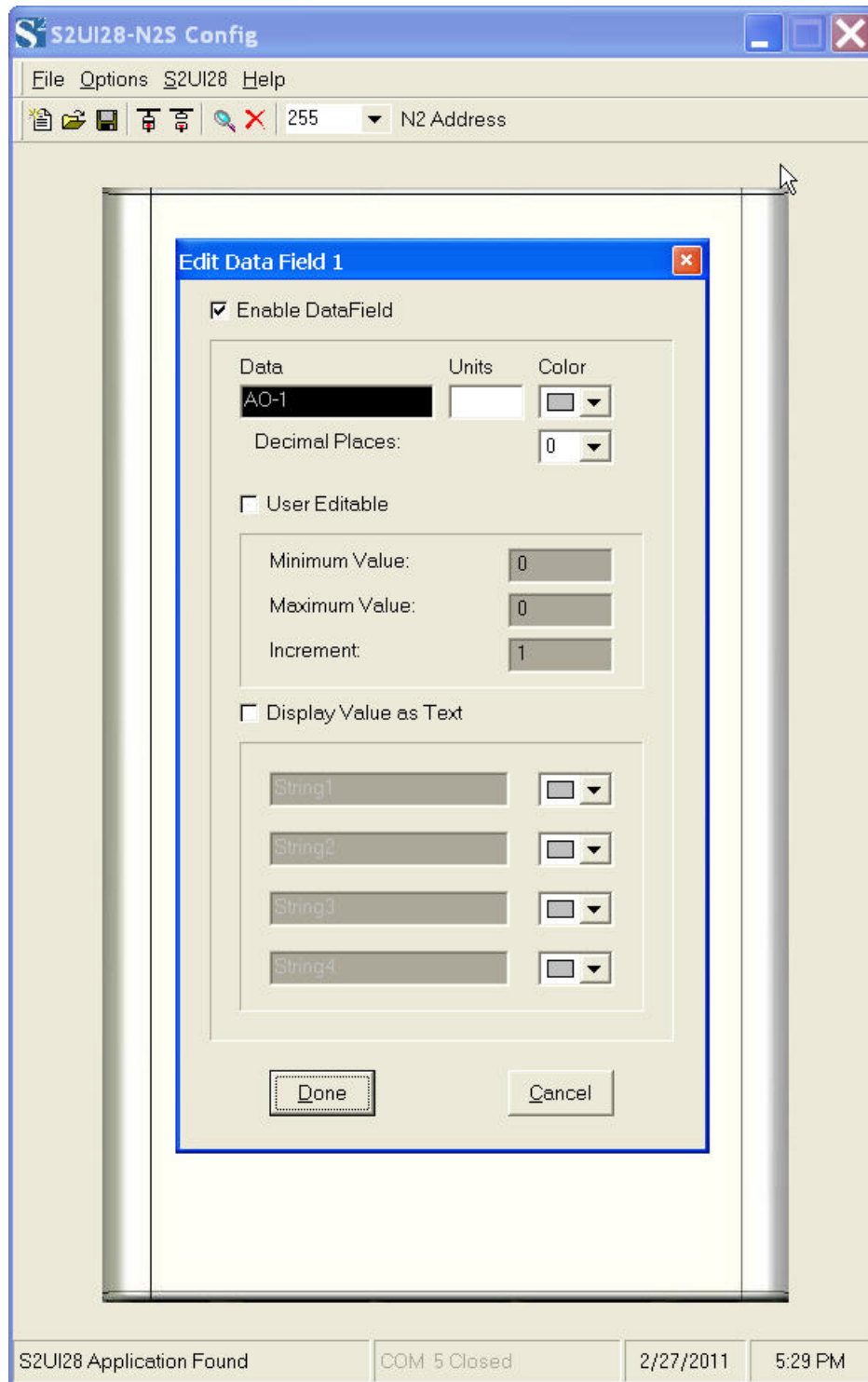
#### Displayed Data as an Enumerated String (19 Characters Max)

Display as Text	Check Box to Display Data as a String
String 1	If Data $\leq 0.0$ String is Displayed at the Color selected
String 2	If $0.5 < \text{Data} \leq 1.5$ String is Displayed at the Color selected
String 3	If $1.5 < \text{Data} \leq 2.5$ String is Displayed at the Color selected
String 4	If Data $> 2.5$ String is Displayed at the Color selected

Now, to access these parameters, you simply mouse-hover over the respective area (Tagname area or Data Area) and right-click the mouse to display the changeable parameters. The following pictures show the drop-down menus of the changeable parameters.



***Tagname Configuration Window – Hover over Tagname and right mouse-click***



**Data Field Configuration Window – Hover over Data Area and right mouse-click**

You only need to configure as many Data Field/Tagname combinations as you wish to a maximum of 15. If you do not use all 15 possible data fields, it is recommended that you disable these fields (i.e. uncheck the “Enable Data Field” parameter), as this will make the Data field invisible on the display.

Once you have completed the configuration, it is recommended that you save the configuration locally for archival purposes. To do this, select the “File-Save” or “File-Save As” menu option, then provide the path and desired filename, and finally press the “Save” button.

### **Data Field Update**

The last step you will do is to update the configuration in the S2UI28 device. It is assumed that you have already “Located” the S2UI28-N2S via Step 7. If so, then select the “S2UI28-Data Fields-Data Fields Update” menu selection. Once completed, you will need to navigate the S2UI28’s display to refresh the currently displayed screen’s configuration. You are done.

### **Data Field Retrieval**

Retrieving a stored data field configuration is as simple as locating a S2UI28 device (see Step 7), and then selecting the “S2UI28-Data Fields-Data Fields Retrieve” menu selection.

### **Configuring the S2UI28-N2S’s Hardware and System Integrator Information**

The S2UI28-N2S has several hardware items that require configuration. The most basic is the N2 device address of the S2UI28-N2S. Remember that the S2UI28-N2S is a N2 Slave device of type “VND” and so it is this address that must be programmed into the device before the device is connected to a live N2 bus. A complete N2 object listing is given in Appendix A as well as further clarification of how some of the N2 points behave.

The other parameters that can be configured are:

- The Enabling or Disabling of the Button Beep  
(i.e. does a beep occur if a user presses a screen button)
- LCD Auto Off or On Control  
(i.e. LCD can dim after a certain period of time, etc)
- System Integrator Information  
(i.e. Company Name, Telephone number, and Install Date)
- The on-board Ethernet controller  
(which is not currently used)

It is also important to navigate away from the current screen to ensure that any changes you made to the screen’s data are saved.

The first configuration screen that should be configured is “Screen-6” of the S2UI28N2S Configuration program:



### N2 and LCD Configuration Screen

Here you will see the following parameters:

N2 Address	N2 Address of the S2UI28-N2S
LCD Off (Secs)	Number of Seconds before the display will automatically dim Setting to "0" disables auto-dimming
LCD Auto On	If Enabled, the LCD will turn on Automatically if the on-board PIR sensor detects a movement (i.e. some approaching the S2UI28). If Disabled, the display requires a user to press the screen to awaken the S2UI28 dimmed display
Button Beep:	Checking this box will generate a audio beep tone when user's press an on-screen button

The automatic dimming of the LCD is quite important for ensuring the highest accuracy of the on-board and off-board temperature sensors, as well as reducing power consumption of the device. Although TFT LCD displays provide the most vibrant and graphic LCD interface experience, they do consume the most power and as a consequence generate heat. The screen's heat can affect the on and off board temperature sensors if the air circulation around the S2UI28-N2S is less than optimum. Consequently, for greatest accuracy of these temperature sensors and lowest possible power consumption, please utilize the LCD Off (auto dim) option.



The next screen (“Screen 7” of the S2UI28N2S Configuration program) contains the Ethernet Connectivity parameters. Ethernet functionality is currently not used, however, the information presented here is for future use.



### Ethernet Configuration Screen

Here you will see the following parameters:

Ethernet	Disabled, Static IP, or DHCP
Static IP	Static IP Address
Gateway IP	Gateway IP Address
Netmask	Network Mask

It is recommended that you disable the Ethernet, as this will also reduce power consumption of the S2UI28-N2S device and so this, too, will improve the on and off board temperature sensors.

Please note that there are no functional Ethernet LED indicators on the S2UI28 device (i.e. no receive or link LED indicators).

The next screen (“Screen 8” of the S2UI28N2S Configuration program) contains the System Integrator Information. This screen is intended to provide information to the User of who installed the device, how to contact them, and the installation date. At times User find it desirable to have this information closely at hand.



**System Integrator Configuration Screen**

Here you will see the following parameters:

Company	System Integrator's Company
Telephone Number	System Integrator's Telephone Number
Install Date	Installation Date

### Configuration Update

The last step you will do is to update the configuration in the S2UI28 device. It is assumed that you have already “Located” the S2UI28-N2S via Step 7. If so, then select the “S2UI28-Device Configuration-Update” menu selection. You are done.

### Configuration Retrieval

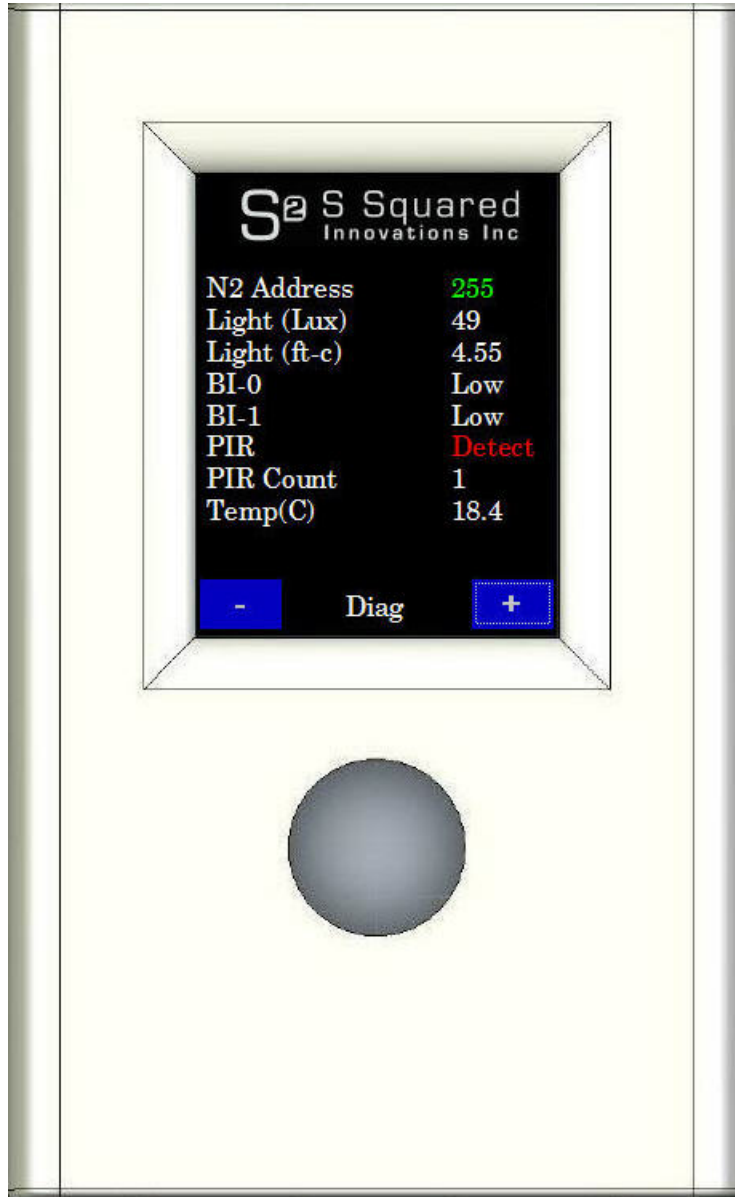
Retrieving a stored data field configuration is as simple as locating a S2UI28 device (see Step 7), and then selecting the “S2UI28-Device Configuration-Retrieve” menu selection.

## Diagnostics Screen

This screen does not appear in the configuration program, but is the last screen on the S2UI28-N2S device. This diagnostic screen is very helpful to the System Integrator, as it provides a lot of information about the S2UI28-N2S device's operational state:

N2 Address	Currently Programmed N2 Address Red if No Communication with Supervisory Controller Green if Actively Communicating with Supervisory Controller
Light (Lux)	Ambient Light Levels in units of Lux
Light (ft-c)	Ambient Light Levels in units of foot-candles
BI-0	Current State of Binary Input 0 (High or Low)
BI-1	Current State of Binary Input 1 (High or Low)
PIR	“0” or “Detect” (in Red) Detect String is displayed if PIR detects movement
PIR Count	Number of detections per time period
Temp(C)	On-board Temperature in units of Celcius

There is one “hidden” button that will allow the System integrator to determine the sensitivity and range of the on-board PIR/Occupancy sensor. This button is located in the PIR Data area (where the “0” or ‘Detect’ is printed). Pressing this area will cause a series of beeps to be generated and then a single beep will be generated for each detect pulse it generates. Stopping the “Detect Beep” is done by pressing the same area (i.e. toggles the detect beep on or off).



**On-Board Diagnostics Screen (Last Screen on S2UI28-N2S)**

## Occupancy Sensor / Passive InfraRed / PIR Sensor Information and associated N2 Points

The S2UI28's Occupancy Sensor, here after called the PIR sensor, deserves some explanation of its associated N2 data points.

As background, the PIR (Passive InfraRed) circuitry already includes false triggering circuitry; however, this circuitry can only do so much and is perhaps not suited to all possible applications. Consequently, the S2UI28 uses a combination of on-board electronic components and digital filtering technology (exposed N2 points) in order to allow the system integrator the ability to "tune" the S2UI28's PIR sensor towards the application intended.

The following points are used with the PIR sensor and an explanation of these points are given below:

BI 3	PIR Unfiltered (Digital) Output This point is the status level of the Sensor without any digital filtering
BI 4	PIR Filtered - Digitally filtered Output This point is the value of the Sensor output digitally filtered. This point is used in conjunction with ADI 1 (PIR Threshold Count).
ADI 1	PIR Threshold Count This point is the value at which BI-4 ( PIR Filtered Output) becomes asserted (i.e. goes from a Low to a High, or a Trigger Pulse).

The Logic for the PIR Filtered Output is as follows:

The number of PIR Unfiltered pulses are counted and once the PIR Threshold Count (ADI - 1) is reached, then the PIR Filtered Output (BI-4) is asserted.

The maximum overall rate at which BI-3 or BI-4 can be asserted is dictated by the S2UI28's electronic circuitry and is approximately 2.7 seconds.

AI 20	PIR Counts per time period This value reflects the number of PIR pulses (triggers) that occur for a fixed time period of 30 seconds. Right now, I have hard coded the 30 second timer, but will create a point (ADI, etc) that will allow the user to change this time period. However, 30 seconds seemed reasonable for my initial release. This value is the same value that is used with ADI-1 to determine when it is to be asserted. I may change this so that ADI-1 is unrelated to AI-20 in a future release in order to improve operation, as I did this rather quickly.
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The nice thing about this point is that it will not update for at least 30 seconds which minimizes the bandwidth on the bus.

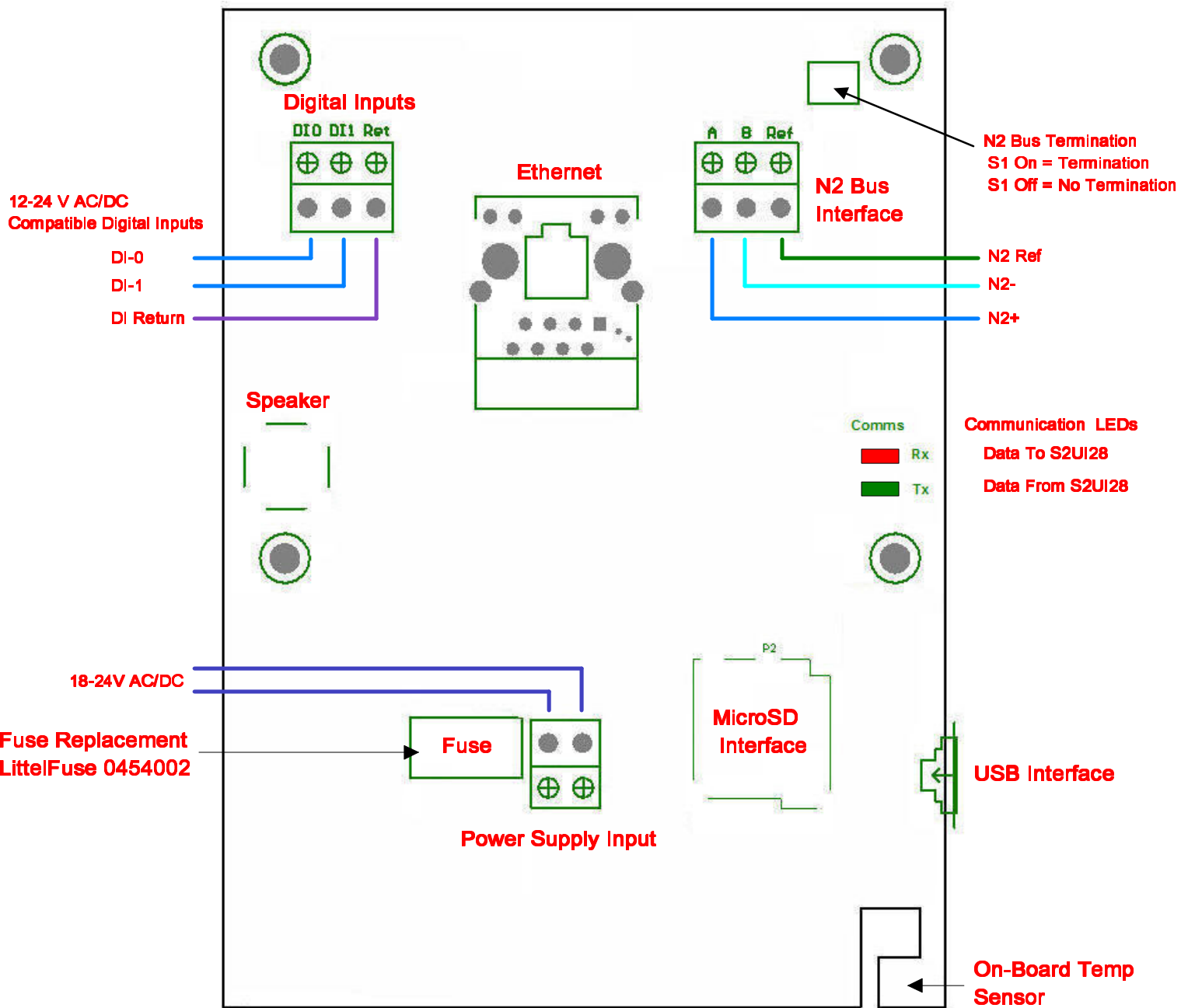
Which point to use? You can select BI 3 or BI 4 depending upon the sensitivity you require. BI 3 is the raw , unfiltered PIR output, whereas BI 4 is the digitally filtered output. BI 4 is used in conjunction with ADI 1, where ADI 1 is the "filtering coefficient".

You could also use AI-20 as well. Here AI-20 gives you the number of PIR triggers that have occurred in the last 30 seconds... Why would you use this? Simply because you can implement your own digital filter in your supervisory to accommodate how sensitive you wish the detection. For example, you could set a threshold in the supervisory such that if AI-20 exceeded 3 (or some number) then a User is present. Remember two things though. Firstly, you will have a maximum count of 11 or so (30 seconds / 2.7). Secondly, PIRs are not perfect and detect abrupt changes in heat distribution (i.e. a person walking through an area, etc) and so if a PIR is placed near a heat vent, then this too can trigger it. So, by having a count, one minimizes these types of artifacts without sacrificing sensitivity.

## S2UI28-N2S Panel Point Map

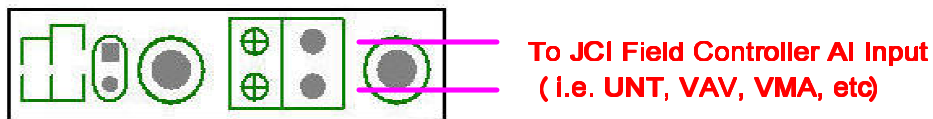
Point Type	Address	Units	Description	Range/Value
BI	1	Open/Closed	On-Board Binary Input	
BI	2	Open/Closed	On-Board Binary Input	
BI	3	Detect/None	PIR Raw Detect Pulse	
BI	4	Detect/None	PIR Filtered Pulse	
AI	1		Data Field User Input Value	
AI	2		Data Field User Input Value	
AI	3		Data Field User Input Value	
AI	4		Data Field User Input Value	
AI	5		Data Field User Input Value	
AI	6		Data Field User Input Value	
AI	7		Data Field User Input Value	
AI	8		Data Field User Input Value	
AI	9		Data Field User Input Value	
AI	10		Data Field User Input Value	
AI	11		Data Field User Input Value	
AI	12		Data Field User Input Value	
AI	13		Data Field User Input Value	
AI	14		Data Field User Input Value	
AI	15		Data Field User Input Value	
AI	16	Lux	Ambient Light Level	
AI	17	Foot-Candles	Ambient Light Level	
AI	18	C	On-Board Temperature Sensor	
AI	19	F	On-Board Temperature Sensor	
AI	20	Count	PIR Counts Per time Period	
AO	1		Data Field 1	Screen 1 1 <sup>st</sup> Item
AO	2		Data Field 2	Screen 1 2 <sup>nd</sup> Item
AO	3		Data Field 3	Screen 1 3 <sup>rd</sup> Item
AO	4		Data Field 4	Screen 2 1 <sup>st</sup> Item
AO	5		Data Field 5	Screen 2 2 <sup>nd</sup> Item
AO	6		Data Field 6	Screen 2 3 <sup>rd</sup> Item
AO	7		Data Field 7	Screen 3 1 <sup>st</sup> Item
AO	8		Data Field 8	Screen 3 2 <sup>nd</sup> Item
AO	9		Data Field 9	Screen 3 3 <sup>rd</sup> Item
AO	10		Data Field 10	Screen 4 1 <sup>st</sup> Item
AO	11		Data Field 11	Screen 4 2 <sup>nd</sup> Item
AO	12		Data Field 12	Screen 4 3 <sup>rd</sup> Item
AO	13		Data Field 13	Screen 5 1 <sup>st</sup> Item
AO	14		Data Field 14	Screen 5 2 <sup>nd</sup> Item
AO	15		Data Field 15	Screen 5 3 <sup>rd</sup> Item
ADI	1	Count	PIR Threshold Count	PIR Filtering Value for BI-4

# S2UI28-N2S Wiring Diagram Rev 1.0 - 2010-02-01



(As viewed from the Back side of the Top half of the Enclosure)

## Off-Board Temperature Sensor JCI Platinum 1K Compatible



(As viewed from the Top side of the Bottom half of the Enclosure)