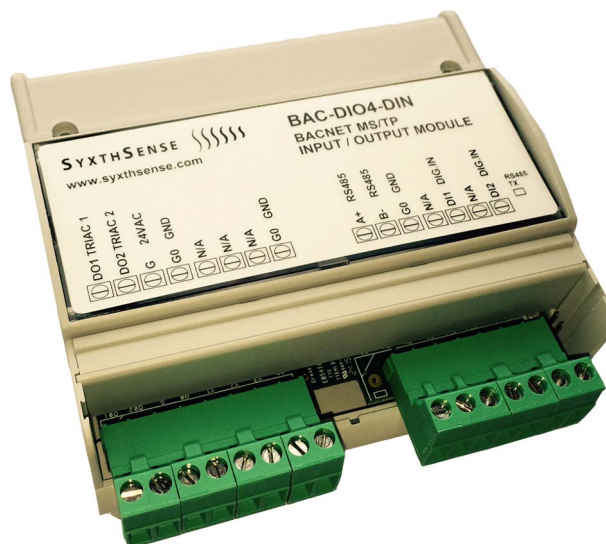# BAC-DIO4-DIN BACnet MS/TP Digital Input / Output Module, DIN-Rail Mounted

BAC-DIO4 has been designed to be a compact DIN-rail mounted BACnet MS/TP input and output module used in control panels.

The module has 2 volt-free digital inputs for measurements e.g. for windows, occupancy sensors and so on.

The module has also 2 digital outputs, 24Vac triacs switching the plant items on/off.
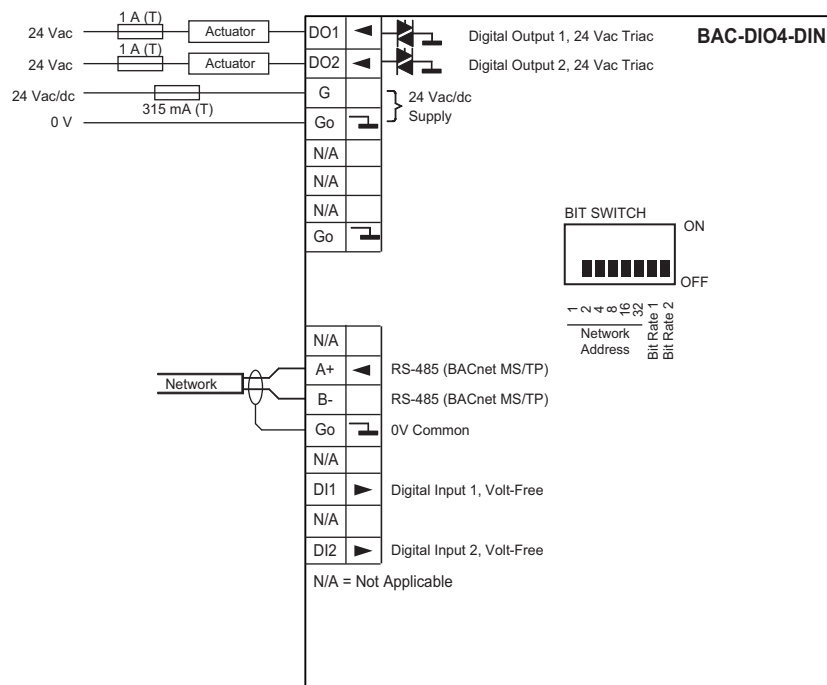
The module supports BACnet MS/TP communications with most commonly used baud rates and parity settings. The module also supports BACnet device and object discovery allowing fast and efficient programming.



| Model Type | Model | Description |
|---|---|---|
| | **BAC-DIO4-DIN** | BACnet MS/TP Digital Input / Output Module, 2DI, 2DO, DIN-Rail Mounted |

**Technical Data**

| | | |
|---|---|---|
| Power Supply | Power supply | 24 Vac/dc -10%/+15% <1 VA |
| Signal Outputs | Digital Outputs | 2 x 24 Vac max. 1 A Triac; requires 24 Vac Power Supply (DO1 & DO2) NOTE: Switching to 0 V |
| Signal Inputs | Digital Inputs | 2 x Volt-Free Contact, Impedance <1 kΩ Pulse Counting: Max 25Hz, Min Pulse Length 20mA (Volatile) |
| Communication | BACnet Communications | |
| | Protocol | BACnet MS/TP |
| | Interface | RS-485; maximum 63 devices |
| | MAC Addressing | 0...63 via a bit switch; 0...247 via tool / network |
| | Communication | 9k6/19k2/38k4/76k8 Baud; Parity None/Even/Odd, 1 or 2 Stop Bits (baud rate adjustable through bit switch) |
| Connections | Terminal Connections | Solid and Stranded Cable, Plug-In Connectors Maximum Size: 0.05 to 2.5mm$^2$ (EN ISO) / 12 to 30 AWG (UL) Rising Clamp: Size 2.5 x 2.4mm |
| Environmental Conditions | Operating | |
| | Temperature | 0...+50 °C (32...122 °F) |
| | Humidity | 0...95 %rh (non-cond.) |
| | Storage | |
| | Temperature | -30...+70 °C (-22...158 °F) |
| | Humidity | 0...95 %rh (non-cond.) |
| Standards | CE Conformity | CE Directive 2004/108/EY EN61000-6-3: 2001 (Generic Emission) EN61000-6-1: 2001 (Generic Immunity). |

| Housing | Degree of Protection | IP20 |
| --- | --- | --- |
| | Housing Material | ABS Plastics, Self Extinguishing |
| | Mounting | DIN-Rail Mounting |
| | Dimensions | W106 x H97 x D38mm |
| | Weight | 180g |

**Wiring Terminals**



| DO1 | Digital Output; 24 Vac Triac Switching to 0 V; max. 1 A<br>**Warning:** Add external fuse (1 A (T)) for the actuator connected to the output. The fuse or correct wiring accessories are not included in the product delivery. |
| --- | --- |
| DO2 | Digital Output; 24 Vac Triac Switching to 0 V; max. 1 A<br>**Warning:** Add external fuse (1 A (T)) for the actuator connected to the output. The fuse or correct wiring accessories are not included in the product delivery. |
| G | 24 Vac/dc Power Supply<br>**Warning:** Add an external fuse (315 mA (T)) for the power supply. The fuse and correct wiring accessories are included in the product delivery. |
| G0 | 0 V Common |
| A+ | RS-485 A+ Connection (BACnet) |
| B- | RS-485 B- Connection (BACnet) |
| G0 | 0 V Common |
| DI1 | Digital Input; Volt-Free, Max 25 Hz, Min Pulse Length 20 ms |
| DI2 | Digital Input; Volt-Free, Max 25 Hz, Min Pulse Length 20 ms |

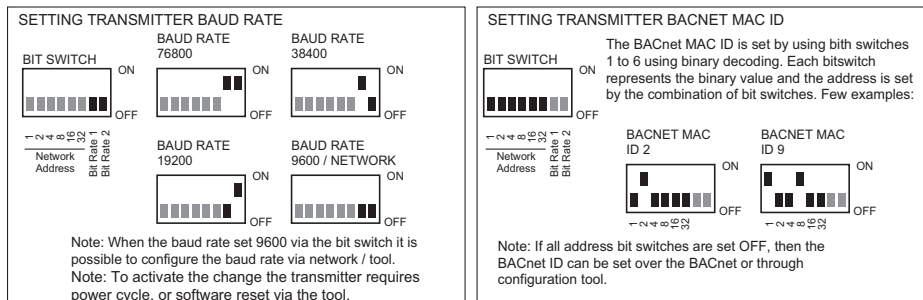**Digital Input Pulse Counting**

Digital Inputs can be used for pulse counting up to 25Hz, minimum pulse length 20mS. The pulse count is stored in a dedicated register and can be read over the network. It is possible to write to this register to reset the value.

*NOTE: The pulse count value is not battery backed, and therefore the network master is required to manage the data synchronisation in case of power failure.*

**Setting Up BACnet Address and Baud Rate**

The BACnet address and the baud rate is normally set through the bit switch. It is also possible to set the address and baud rate over the configuration tool or over the BACnet communication network.

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***NOTE: The new settings are activated automatically after approx 5 seconds if the bit switch positions have not been moved. In this case the controller reset is applied to activate the new settings.***



### BACnet Interoperability Building Blocks Supported (Annex K)

| Application Service | Initiate | Execute | BIBB |
|---|---|---|---|
| ReadProperty | | Yes | DS-RP-B |
| ReadPropertyMultiple | | Yes | DS-RPM-B |
| WriteProperty | | Yes | DS-WP-B |
| ReinitializeDevice | | Yes | |
| Who-Is | | Yes | DM-DDB-B |
| I-Am | Yes | | |
| Who-Has | | Yes | DM-DOB-B |
| I-Have | Yes | | |
| DeviceCommunicationControl | | Yes | DM-DCC-B |

### BACnet Standard Object Types Supported

No dynamic Creation or Deletion supported. Objects, and object instances, are assigned to fixed functions within the proprietary control application of the product as follows:

| Object | Number Of Instances | Instance Assignments |
|---|---|---|
| Device Object | 1 | |
| Binary Input | 2 | BI(0) – DI1 input<br>BI(1) – DI2 Input |
| Binary Output | 2 | BO(0) – DO1 Output<br>BO(1) – DO2 Output |

### Device Object Properties (Required Object Properties)

| Property Name /ID | Attributes | Range | Default |
|---|---|---|---|
| Object Identifier | R/W | | MAC_Address + 651000 |
| Object Name | R/W | 32 Characters Max | Concatenation of product type and MAC address i.e. "BIO_001" |
| Object Type | R | | 8 |
| System Status | R | | STATUS_OPERATIONAL |
| Vendor Name | R | | SyxthSense |
| Vendor Identifier | | | 651 |
| Model Name | R | | URD |
| Protocol Version | R | | 1 |
| Protocol Revision | R | | 10 |
| Max APDU Length | R | | 480 |
| Segmentation Support | R | | No |
| APDU Timeout | R | | 3000 ms |
| Number APDu Retries | R | | 3 |
| MaxMaster | R | | 127 |
| Max_Info_Frames | R | | 1 |
| Database Revision | R | | 0 |

**Binary Input Objects**

|  | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R |  |  |
|  | Object Name | R |  | BI(0) = "DI1"<br>BI(1) = "DI2" |
|  | Object Type | R |  | 3 |
|  | Present Value | R/W | 0..1 |  |
|  | Status Flags | R |  |  |
|  | Event State | R |  |  |
|  | Out-Of-Service | R/W |  | FALSE |
|  | Polarity | R/W |  | POLARITY_NORMAL |
|  | Active Text | R |  | "on" |
|  | Inactive Text | R |  | "off" |
| **Optional Properties** | None |  |  |  |
| **Proprietary Properties** | None |  |  |  |

**Binary Output Objects**

|  | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R |  |  |
|  | Object Name | R |  | BO(0) = "DO1"<br>BO(1) = "DO2" |
|  | Object Type | R |  | 4 |
|  | Present Value | R/W | 0..1 |  |
|  | Status Flags | R |  |  |
|  | Event State | R |  |  |
|  | Out-Of-Service | R/W |  | FALSE |
|  | Polarity | R/W |  | POLARITY_NORMAL |
|  | Priority Array | R |  |  |
|  | Relinquish Default | R/W |  | BINARY_INACTIVE |
|  | Active Text | R |  | "on" |
|  | Inactive Text | R |  | "off" |
| **Optional Properties** | None |  |  |  |
| **Proprietary Properties** | None |  |  |  |

**Proprietary Object Types**      No dynamic Creation or Deletion supported

| Object | Number Of Instances | Instance Assignments |
|---|---|---|
| Application Configuration Object | 1 | Provides a container for all the proprietary application specific properties. |

**App_Config Object**

|  | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R |  | MAC_Address + 651000 |
|  | Object Name | R |  | "App_Config" |
|  | Object Type | R |  | 128 |
| **Optional Properties** | None |  |  |  |

|  | Property ID | Description | BACnet Data Type | Range |
|---|---|---|---|---|
| **Proprietary Properties** | 30100 | Firmware Version | Unsigned | Read Only |
|  | 40050 | MAC Address | Unsigned | 0..255 |
|  | 40051 | Baud Rate | Unsigned | 0 = 9600 (Default)<br>1 = 19200<br>2 = 38400<br>3 = 57600 |
|  | 40067 | Hold On Delay Setting for Digital Input 1 | Unsigned | 1..7200 Seconds |
|  | 40068 | Hold On Delay Setting for Digital Input 2 | Unsigned | 1..7200 Seconds |
|  | 40100 | Force Reset | Unsigned | 0 = Normal<br>1 = Force Reset |
|  | 40101 | Non Volatile Memory Update | Unsigned | 0 = Normal<br>1 = Update |
|  | 40103 | Force Factory Defaults | Unsigned | 0 = Normal<br>1 = Force Defaults |
|  | 40104 | Force 0..10V Output Calibration Routine | Unsigned | 0 = Normal<br>1 = Force Calibration |