EXDD-02 Digital Input Expansion

A Much Better Idea : Logical : Unique

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Electronic Controllers

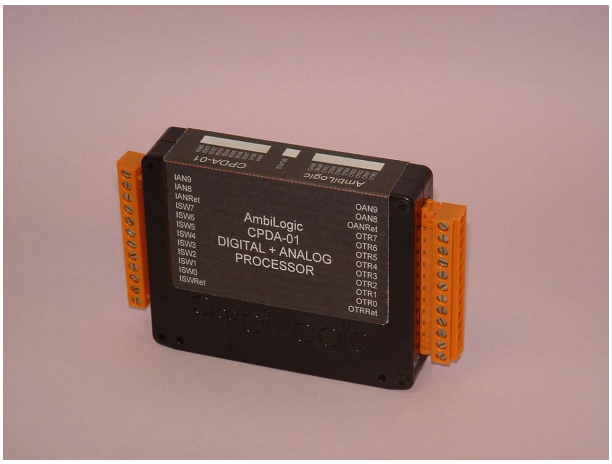
Features:-

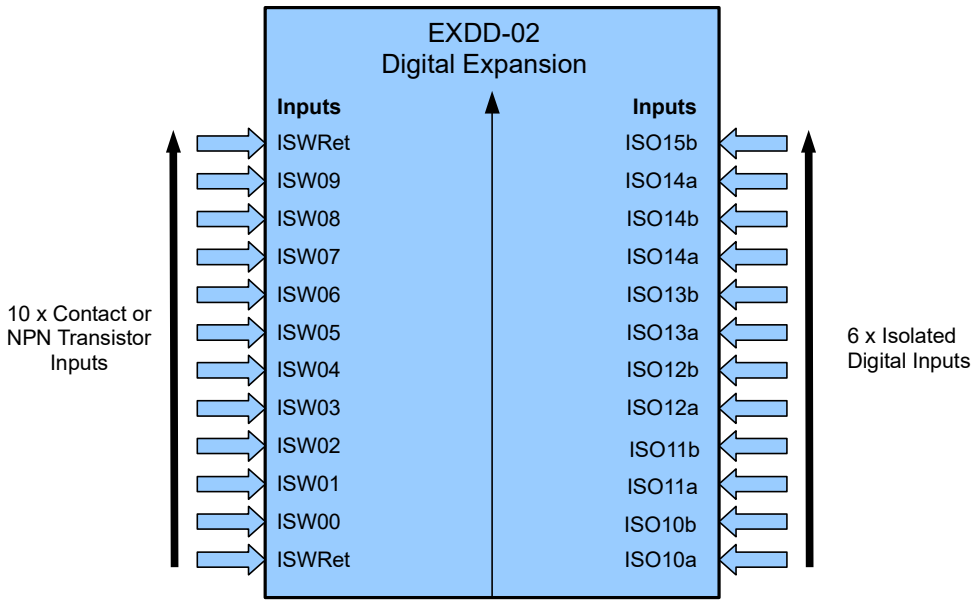
16 inputs:-

- 10: simple switch/NPN inputs
- 6: isolated digital inputs.

Low 2W power consumption.

Connections via detachable screw terminals.





Connection Diagram

The EXDD-02 is a programmable digital input expansion module which plugs into an AmbiLogique backplane. This module offers 10 switch/NPN digital inputs similar to those on the CPDA-01 Processor Module, plus 6 isolated polarity-insensitive voltage-driven digital inputs.

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The EXDD-02 has the following selection of inputs:-

- 10 switch or NPN non-isolated transistor digital inputs
- 6 0 to 40V isolated polarity-insensitive digital inputs.

This makes a total of 16 inputs.

Connections are made via detachable screw terminals.

The EXDD-02 controller plugs into any numbered slot in any of the AmbiLogique backplanes, and takes its power from the backplane. Its Slot address is picked up automatically from the backplane, and its facilities then become available to diagrams running in the Processor module on the backplane.

A new feature of the EXDD-02 is its 6 isolated digital inputs.
These are voltage-sensing and are polarity-insensitive.
A voltage of less than 2.5 will be seen as logic 0: a voltage of more than 4.5 is a logic 1.
These inputs withstand differential voltages up to 40 in either direction.
The common-mode voltage may be up to 130 peak.
NOTE: These inputs are NOT rated for mains voltage isolation.

These isolated inputs are extremely useful where PNP-output sensors are the only option.

Please Note: Some AmbiLogique products or components may carry the “AmbiLogic” trade mark from our former Australian company.

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Connections:

Note: The Subslot, Register and Mask values are needed to map the physical inputs and outputs into the Control Diagram.

Terminal	Signal	Description	Subslot	Register	Mask
A12	ISWRet	Return for ISW Inputs			
A11	ISW9+	Switch / Contact / NPN Input	0	1	512
A10	ISW8+	Switch / Contact / NPN Input	0	1	256
A09	ISW7+	Switch / Contact / NPN Input	0	1	128
A08	ISW6+	Switch / Contact / NPN Input	0	1	64
A07	ISW5+	Switch / Contact / NPN Input	0	1	32
A06	ISW4+	Switch / Contact / NPN Input	0	1	16
A05	ISW3+	Switch / Contact / NPN Input	0	1	8
A04	ISW2+	Switch / Contact / NPN Input	0	1	4
A03	ISW1+	Switch / Contact / NPN Input	0	1	2
A02	ISW0+	Switch / Contact / NPN Input	0	1	1
A01	ISWRet	Return for ISW Inputs			
C01	ISW15b	Isolated Input	0	2	32
C02	ISW15a	Isolated Input			
C03	ISW14b	Isolated Input	0	2	16
C04	ISW14a	Isolated Input			
C05	ISW13b	Isolated Input	0	2	8
C06	ISW13a	Isolated Input			
C07	ISW12b	Isolated Input	0	2	4
C08	ISW12a	Isolated Input			
C09	ISW11b	Isolated Input	0	2	2
C10	ISW11a	Isolated Input			
C11	ISW10b	Isolated Input	0	2	1
C12	ISW10a	Isolated Input			

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Interface to Diagram:

The Slot address for all facilities is taken from the slot into which the EXDD-02 is plugged. In practice this will be 1 upwards, because Slot 0 is always occupied by the Processor Module.

Subslot 0: Input/Output

Register 0:	Device Identifier: returns hex A502 (42242) for EXDD-02.
Register 1:	Contact/NPN Inputs: bit mapped: use mask to select required input.
Register 2:	Isolated digital inputs: bit mapped: use mask to select required input.

Specifications

1. Power Input:
   +8V 100 mA
   This is the standard output from the AmbiLogique Power/Comms modules – so you don't have to worry about it.
   The current quoted is with all inputs ON.

2. Contact / NPN Transistor Digital Inputs:

Excitation voltage:	6.0 to 9.0 V
Sink current:	3.0 to 5.0 mA
Maximum Input voltage:	-1.0 to +120 V
Protection:	Blocking diode
Internal signal:	open = FALSE; closed = TRUE;
Thresholds:	5.0 V (open); 3.0 V (closed) typical

3. Isolated Digital Inputs:

Excitation voltage: logic 0:	0 to 2.5 V
Excitation voltage: logic 1:	4.5 to 40 V
Polarity:	Don't care
Input current:	internally limited: 5.0 to 7.0 mA
Protection:	Bipolar transient voltage suppressor
Internal signal:	low voltage = FALSE; high voltage = TRUE

Specifications (continued)

4. Dimensions:
   Heights: 83 mm above backplane
   97 mm above mounting base when assembled
   on to an AmbiLogique backplane on TS35 rail.

   Width: 25.0 mm max

   Depths: 103 mm over body
   125 mm over terminals

7. Ambient temperature: -10 to +60 °C

Indicators

There are 3 groups of indicators on the top panel of the EXDD-02.

Contact / NPN Input Group:
These are labelled "**ISW0**" through "**ISW9**"
The indicators are ON when the input is TRUE, i.e. switched to Return.

Isolated Input Group:
These are labelled "**ISO10**" through "**ISO15**"
The indicators are ON when the input is TRUE, i.e. energised at more than threshold voltage.

Comms:
This indicator flashes each time the module is interrogated or commanded via the backplane bus. The indicator lights when it recognises a packet addressed to its slot, and goes out when the response has been transmitted.
If this indicator is not flashing, the module is not being addressed. This is not necessarily a fault condition if the processor is not reading the module's inputs or adjusting it s outputs. That is to say if the diagram makes no reference to any of the EXDD-02's inputs or outputs, no packets will be sent to the module, and the Status indicator will not flash.
If the outputs alone are referenced, even if the outputs are unchanging, the backplane communications protocol ensures that they are refreshed periodically, so the Status indicator will flash.

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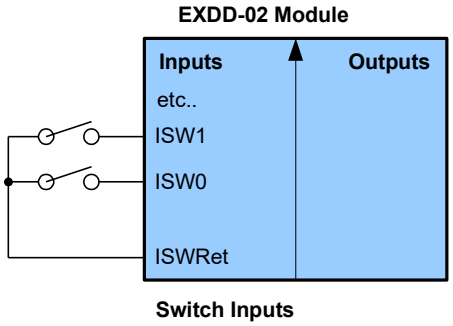
Connecting External Devices

1. Switch Inputs ISW0..9

a) Contact Input:

Wire the contact between ISW.. and ISWRet.

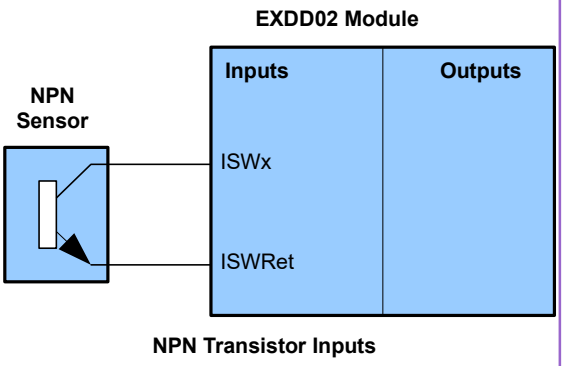
The input will be TRUE when the contact is closed.



b) NPN Transistor Input:

Collector to ISW..
Emitter to ISWRet

The input will be TRUE when the transistor is ON.



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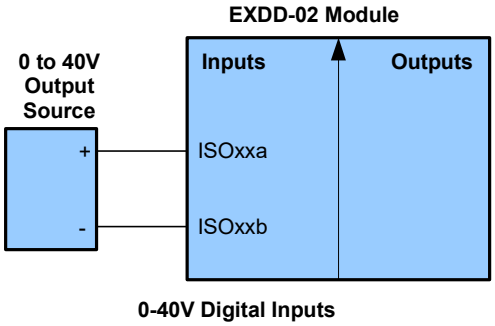
Connecting External Devices (continued)

2. Isolated Inputs ISW10 thru 15:

a) 0 to 40 V input:

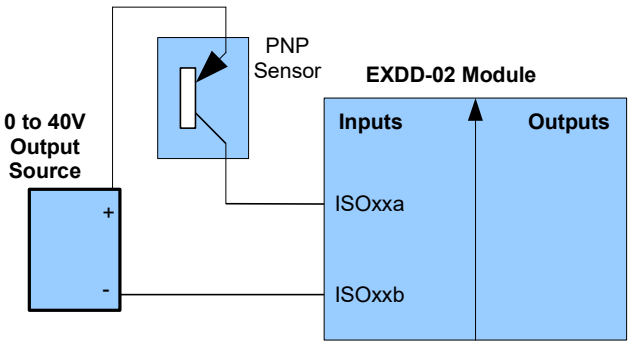
Apply with either polarity to activate the input.



0-40V Digital Inputs

b) PNP or high side or low side switch:

Because a voltage of either polarity will be detected as '1', there is complete freedom of choice in switch and voltage source configurations.



PNP Transistor Inputs

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WARNING
SAFETY-CRITICAL SYSTEMS

A Safety-Critical system is a system whose failure or malfunction could cause death, significant injury or loss of property.

AmbiLogique products incorporate electronic hardware and software, both of which carry a remote but real possibility of failure. AMBILOGIQUE DOES NOT WARRANT, CLAIM OR REPRESENT THAT ITS PRODUCTS ARE INFALLIBLE.

It is therefore THE RESPONSIBILITY OF THE DESIGNER of any safety-critical system which incorporates AmbiLogique products to ensure that:-

1. The system is designed so that any failure of an AmbiLogique component will not cause death, injury or loss of property.
2. The system incorporates independent monitoring means which detect the failure of any of the electronic control elements.
3. The system has alternative and independent means of control which enable it to be controlled and shut down in an orderly manner.
4. Any and all other industry-specific safety requirements are fully implemented.

Revision History:

R 0.0 2021-11-25 Initial issue.