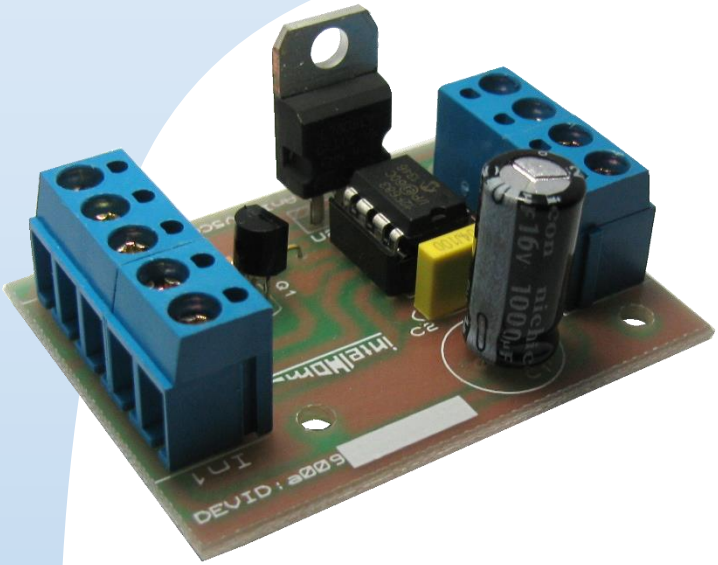
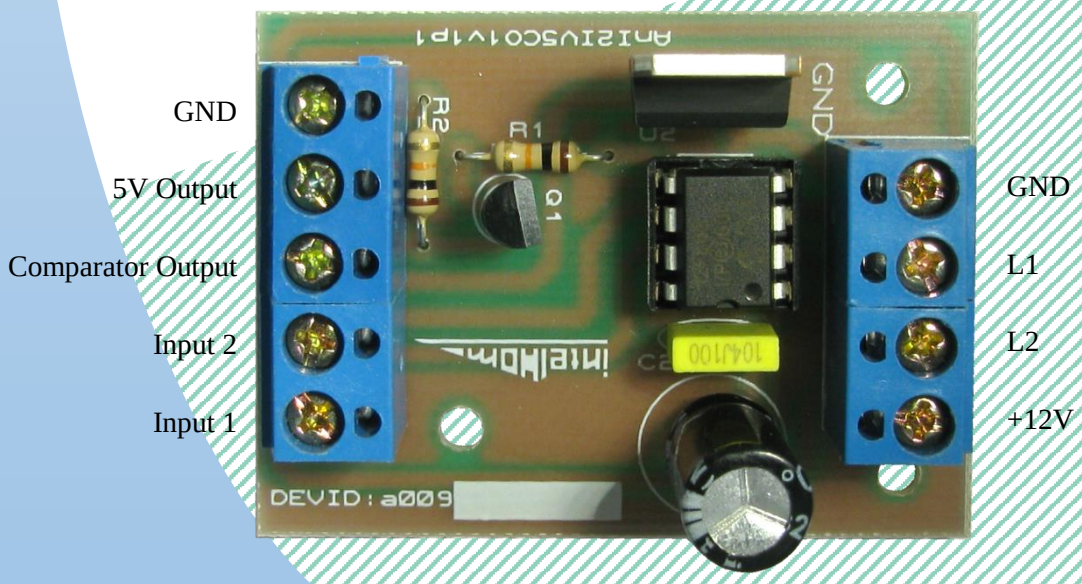
Ani2IV5CO1v1p1



Device ID	A009 ---- ----
Protocols	ihdw1
ihdw Buffer Size	11 bytes
Microcontroller	PIC12F683
Free EEPROM	199 bytes
Operating Voltage	6-15 VDC
Maximum Current	15 mA @ 12 V
Board Dimensions	38 x 52 mm^2
Height	24 mm
Inputs Voltage Range	0-5 VDC
Comp. Output Voltage	0 or Supply Volt.
5V Output Max. Current	400 mA

There are two analog inputs on this module. Each input can measure 0 to 5 VDC independently. There are 3 low values and 3 high values for each input, that passing the input value from them fires the related event. There is also a comparator digital output, can be used to generate a digital signal (0 or 12 VDC) according to the value of inputs. Comparator output value can be related to the value of both inputs or can be the result of the comparison of one input with a constant value. To avoid output bouncing you can specify hysteresis value for the comparator output. The 5 VDC output can provide up to 400 milliamps to power the analog sensors.



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Introduction

There are two analog inputs on this module. Each input can measure 0 to 5 VDC independently. There are 3 low values and 3 high values for each input, that passing the input value from them fires the related event. There is also a comparator digital output, can be used to generate a digital signal (0 or 12 VDC) according to the value of inputs. Comparator output value can be related to the value of both inputs or can be the result of the comparison of one input with a constant value. To avoid output bouncing you can specify hysteresis value for the comparator output. The 5 VDC output can provide up to 400 milliamps to power the analog sensors.

EEPROM Data Structure

There is a *PIC12F683* microcontroller on this module that has 256 bytes of EEPROM. The EEPROM divided into several parts as described below.

- Bytes 0-5 store device ID.
- The device address stored in bytes 6-8,
- Bytes 9-38 used to store the value of properties.
- Bytes 39-50 used to store the address of events.
- Bytes 51-250 are free and used to hold events data.
- Byte 251 stores module state variables and must not be edited.
- Bytes 252-255 are reserved for special purposes.

All bytes can be read using *ihdw ReadEEPROM* command. Bytes 0-8 are read-only; other bytes can be modified by *ihdw WriteEEPROM* command. The only way to change module address is sending *ihdw SetAddress* packet.

Table 1- AnI2IV5CO1v1p1 EEPROM data structure

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	A0	09	??	??	??	??	??	??	??	??	??	??	??	??	??	??
10	??	??	??	??	??	??	??	??	??	??	??	??	??	??	??	??
20	??	??	??	??	??	??	??	??	??	??	??	??	??	??	??	??
30	??	??	??	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
40	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
50	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
60	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
70	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
80	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
90	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	??	??	??	??	??

Device ID	Device Address	Properties	Events Address	Free	State Variables	Reserved

Properties

Here is the list of module properties, these values define the behavior of the module. The module must be reset after changing properties to load new values. Note that the most significant byte of each value stores first.

Table 2- AnI2IV5CO1v1p1 properties

Name	Comp.Variable	EEPROM Address	9 = 0x09
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	This value is used by comparator expression.		

Name	Comp.Hysteresis	EEPROM Address	11 = 0x0B
Type	Number	Size	1 bytes
Range	0-255	Default	10
Description	This value determines the hysteresis of the comparator.		

Name	Comp.Expression	EEPROM Address	12 = 0x0C
Type	Number	Size	1 bytes
Range	0-6	Default	0
Description	This expression is used to calculate comparator output. 0: None 1: Input1 < Input2 2: Input1 > Input2 3: Input1 < Comp.Variable 4: Input2 < Comp.Variable 5: Input2 > Comp.Variable 6: Input1 > Comp.Variable		

Name	AutoResetInterval	EEPROM Address	14 = 0x0E
Type	Number	Size	1 bytes
Range	0-255 = 0-2550 seconds	Default	30 = 300 seconds
Description	Indicates the time delay (in seconds) between inputs reset. Each unit equals 10 seconds.		

Name	AutoResetInputs	EEPROM Address	13 = 0x0D
Type	Number	Size	1 bytes
Range	0-3	Default	0
Description	Determines the inputs that must be reset automatically at certain intervals. 0: None 1: Input2 2: Input1 3: Input1 and Input2		

Name	Input1SetPoint1H	EEPROM Address	27 = 0x1B
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input1GotMoreThanH1 event		

Name	Input1SetPoint1L	EEPROM Address	15 = 0x0F
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input1GotLessThanL1 event		

Name	Input1SetPoint2H	EEPROM Address	29 = 0x1D
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input1GotMoreThanH2 event		

Name	Input1SetPoint2L	EEPROM Address	17 = 0x11
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input1GotLessThanL2 event		

Name	Input1SetPoint3H	EEPROM Address	31 = 0x1F
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input1GotMoreThanH3 event		

Name	Input1SetPoint3L	EEPROM Address	19 = 0x13
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input1GotLessThanL3 event		

Name	Input2SetPoint1H	EEPROM Address	33 = 0x21
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input2GotMoreThanH1 event		

Name	Input2SetPoint1L	EEPROM Address	21 = 0x15
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input2GotLessThanL1 event		

Name	Input2SetPoint2H	EEPROM Address	35 = 0x23
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input2GotMoreThanH2 event		

Name	Input2SetPoint2L	EEPROM Address	23 = 0x17
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input2GotLessThanL2 event		

Name	Input2SetPoint3H	EEPROM Address	37 = 0x25
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input2GotMoreThanH3 event		

Name	Input2SetPoint3L	EEPROM Address	25 = 0x19
Type	Number	Size	2 bytes
Range	0-1023	Default	0
Description	The value for raising the Input2GotLessThanL3 event		

Commands

To use this module, you must send *ihdw* commands to it. The below table contains all commands that are supported by *AnI2IV5CO1v1p1*. For more information about sending *ihdw* commands refer to *ihd Protocol* datasheet available at *intelHom* website (www.intelhom.com).

Table 3- AnI2IV5CO1v1p1 commands

Name	GetInputs	Value	20 = 0x14
Description	Returns the value of inputs and comparator output.		
Input (0 bytes)	no parameters	Output (5 bytes)	First and second bytes: Value of first input Input1 = Byte1 x 256 + Byte2 Third and fourth bytes: Value of second input Input2 = Byte3 x 256 + Byte4 First bit of fifth byte is the value of comparator output.

Name	GetInput1	Value	22 = 0x16
Description	Returns the value of the first input.		
Input (0 bytes)	no parameters	Output (2 bytes)	Value of input (Byte1 x 256 + Byte2)

Name	GetInput2	Value	23 = 0x17
Description	Returns the value of the second input.		
Input (0 bytes)	no parameters	Output (2 bytes)	Value of input (Byte1 x 256 + Byte2)

Name	GetComparator	Value	26 = 0x1A
Description	Returns the value of comparator output.		
Input (0 bytes)	no parameters	Output (1 bytes)	Bit0: Value of comparator output

Name	ResetInput1	Value	30 = 0x1E
Description	Resets the first input and causes execution of the events related to its value.		
Input (0 bytes)	no parameters	Output (0 bytes)	no results

Name	ResetInput2	Value	33 = 0x21
Description	Resets the second input and causes execution of the events related to its value.		
Input (0 bytes)	no parameters	Output (0 bytes)	no results

Name	ResetBothInputs	Value	35 = 0x23
Description	Resets both inputs and causes execution of the events related to their values.		
Input (0 bytes)	no parameters	Output (0 bytes)	no results

Name	SetCompareValue	Value	50 = 0x32
Description	Sets the value of comparator variables.		
Input (2 bytes)	First and second bytes: New value Value = Byte1 x 256 + Byte2	Output (0 bytes)	no results

Name	GetCompareValue	Value	53 = 0x35
Description	Returns the value of the comparator variable.		
Input (0 bytes)	no parameters	Output (3 bytes)	First and second bytes: Value of variable Value = Byte1 x 256 + Byte2

Name	SetPointValueSet	Value	60 = 0x3C
Description	Sets the values for the execution of specified events.		
Input (5 bytes)	First byte: Set-point index (0-5) 0: Input 1 set-point 1 1: Input 1 set-point 2 2: Input 1 set-point 3 3: Input 2 set-point 1 4: Input 2 set-point 2 5: Input 3 set-point 3 Second and third bytes: New low value Forth and fifth bytes: New high value ValueL = Byte2 x 256 + Byte3 ValueH = Byte4 x 256 + Byte5	Output (0 bytes)	no results

Name	SetPointValueGet	Value	63 = 0x3F
Description	Returns the value for the execution of specified events.		
Input (1 bytes)	Set-point index (0-5) 0: Input 1 set-point 1 1: Input 1 set-point 2 2: Input 1 set-point 3 3: Input 2 set-point 1 4: Input 2 set-point 2 5: Input 3 set-point 3	Output (5 bytes)	First byte presents the set-point index (0-5) 0: Input 1 set-point 1 1: Input 1 set-point 2 2: Input 1 set-point 3 3: Input 2 set-point 1 4: Input 2 set-point 2 5: Input 3 set-point 3 Second and third bytes: Low value Forth and fifth bytes: High value ValueL = Byte2 x 256 + Byte3 ValueH = Byte4 x 256 + Byte5

Name	ReadEEPROM	Value	0 = 0x00
Description	Reads data from the device EEPROM.		
Input (2 bytes)	First byte: Address to start reading Second byte: Number of bytes to read (maximum = 8)	Output (3-10 bytes)	First byte: Address of reading start Second byte: Number of read bytes Next bytes: Read data

Name	WriteEEPROM	Value	1 = 0x01
Description	Writes data to the device EEPROM.		
Input (3-10 bytes)	First byte: Address to start writing Second byte: Number of bytes to write (maximum = 8) Next bytes: Data to write	Output (0 bytes)	no results

Name	SoftResetDevice	Value	4 = 0x04
Description	Restarts the device.		
Input (0 bytes)	no parameters	Output (0 bytes)	no results

Name	GetOutputs	Value	70 = 0x46
Description	Returns the outputs enabled, comparator output, and virtual outputs.		
Input (0 bytes)	no parameters	Output (1 byte)	Bit0: First virtual output of input1 Bit1: Second virtual output of input1 Bit2: Third virtual output of input1 Bit3: Comparator output Bit4: First virtual output of input2 Bit5: Second virtual output of input2 Bit6: Third virtual output of input2 Bit7: Indicates if outputs are enabled.

Name	EnableOutputs	Value	73 = 0x49
Description	Enables outputs.		
Input (0 bytes)	no parameters	Output (0 bytes)	no results

Name	DisableOutputs	Value	76 = 0x4C
Description	Disables outputs.		
Input (0 bytes)	no parameters	Output (0 bytes)	no results

Events

Each event occurs in a certain condition. The below table contains all events that are supported by *AnI2IV5CO1v1p1*. For more information about sending *ihdw* commands refer to *ihd Protocol* datasheet available at *intelHom* website (www.intelhom.com).

Table 4- AnI2IV5CO1v1p1 events

Name	Input1GotMoreThanH1	EEPROM Address	45 = 0x2D
Description	This occurs when input 1 value became more than Input1H1.		

Name	Input1GotMoreThanH2	EEPROM Address	46 = 0x2E
Description	This occurs when input 1 value became more than Input1H2.		

Name	Input1GotMoreThanH3	EEPROM Address	47 = 0x2F
Description	This occurs when input 1 value became more than Input1H3.		

Name	Input1GotLessThanL1	EEPROM Address	39 = 0x27
Description	This occurs when input 1 value became less than Input1L1.		

Name	Input1GotLessThanL2	EEPROM Address	40 = 0x28
Description	This occurs when input 1 value became less than Input1L2.		

Name	Input1GotLessThanL3	EEPROM Address	41 = 0x29
Description	This occurs when input 1 value became less than Input1L3.		

Name	Input2GotMoreThanH1	EEPROM Address	48 = 0x30
Description	This occurs when input 2 value became more than Input2H1.		

Name	Input2GotMoreThanH2	EEPROM Address	49 = 0x31
Description	This occurs when input 2 value became more than Input2H2.		

Name	Input2GotMoreThanH3	EEPROM Address	50 = 0x32
Description	This occurs when input 2 value became more than Input2H3.		

Name	Input2GotLessThanL1	EEPROM Address	42 = 0x2A
Description	This occurs when input 2 value became less than Input2L1.		

Name	Input2GotLessThanL2	EEPROM Address	43 = 0x2B
Description	This occurs when input 2 value became less than Input2L2.		

Name	Input2GotLessThanL3	EEPROM Address	44 = 0x2C
Description	This occurs when input 2 value became less than Input2L3.		

Troubleshooting

If the module stopped working, first of all, check the module power supply and data connection lines. If the device still not working refer to this section to find the problem. If the problem does not solve, it is recommended to replace the module with a new one and contact *intelHom* service office in your country.

Events do not fire:

Check inputs voltage and sensors power supply.

Comparator output does not change:

Check inputs voltage and sensors power supply.

Comparator output does not change:

Check hysteresis value.

If none of the above solutions solved the problem, just replace the module with a new one.

Worldwide Sales and Service

For more information about worldwide sales and service offices, visit www.intelhom.com website.