ICM-HDIO-20P

High Denisty I/O Expander - 8 I/O Modules Input/Output

Electronic Solutions for the 21st Century

ICM-HDIO-20P

PRODUCT DESCRIPTION:

The **ICM-HDIO-20P** is designed for direct connection with any of the Divelbiss *Bear Bones*, *High Density Bear Bones*, *Boss Bear*, *Boss32*, *Universal Control Panel (UCP)* and *Universal Machine Controller (UMC)* product families.

PRODUCT FEATURES:

- Quickly Connects using ICM-HDCA Series Cables
- Optically Isolated I/O points
- Reverse polarity protection
- Small size and light weight
- Mounts on industry standard DIN rail type NS31 or NS35
- Addressable via programming jumpers
- Detatachable Input / Output blocks
- Polarized and locking data and power bus connections
- LED monitoring of I/O status
- Engineered to meet NEMA part ICS 3-304
- Module Inputs and/or Outputs
- Fused Outputs with Spare Fuse & Fuse Tester

Proudly Made in the USA

Data Sheet

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----WARNING----

The ICM-HDIO-20P, as with other solid state control devices, must not be used in applications which would be hazardous to personnel in the event of failure of the controller. Precautions must be taken to provide mechanical and/or electrical safeguards external to the controller. This device is **NOT APPROVED** for domestic or human medical use.

Input SPECIFICATIONS:

# Channels:	up to 8
Input Voltage:	Module Dependent

AC Input Modules

AC Input Module MODEL:	ICM-HDMI-01	ICM-HDMI-02
Input Voltage Range:	90-140 VAC	180-280 VAC
Input Current:	11mA (@ Max Line)	6.5mA (@ Max Line)
Turn on Time:	20mSec	2mSec
Turn off Time:	20mSec	20mSec
Input Allowed for No Output:	3mA, 45VAC	1.7mA, 80VAC
Input Resistance:	14K Ohms	14K Ohms
Operating Temp:	-30 to 70 deg. C	-30 to 70 deg. C
Isolation (Input to Output):	4000VRMS	4000VRMS

DC Input Modules

DC Input Module MODEL:	ICM-HDMI-03	ICM-HDMI-04	ICM-HDMI-05	ICM-HDMI-06	ICM-HDMI-07
Input Voltage Range:	12-32VDC	2.5-16VDC	4-16VDC	2.5-28VDC	35-60VDC
Input Current:	25mA (@ Max Line)	30mA (@ Max Line)	45ma(@ Max Line)	30mA(@ Max Line)	6mA(@ Max Line)
Turn on Time:	5mSec	.025mSec	.05mSec	1mSec	10mSec
Turn off Time:	5mSec	.025mSec	.1mSec	1.5mSec	10mSec
Input Allowed for No Output:	1mA, 3VDC	.2mA, 1VDC	.7mA, 1VDC	.2mA, 1VDC	.8mA, 9VDC
Input Resistance:	1K Ohms	500 Ohms	300 Ohms	900 Ohms	10K Ohms
Operating Temp:	-30 to 70 deg. C	-30 to 70 deg. C	-30 to 70 deg. C	-30 to 70 deg. C	-30 to 70 deg. C
Isolation (Input to Output):	4000VRMS	4000VRMS	4000VRMS	4000VRMS	4000VRMS

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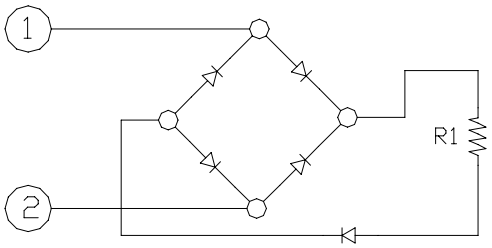
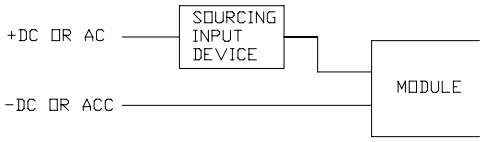
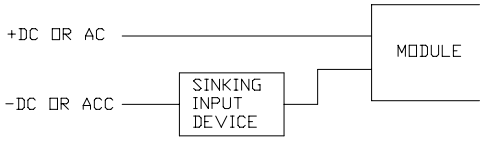
TYPICAL INPUT CIRCUIT DIAGRAMS

Typical ICM-HDIO-20P Module Input Circuit





Sinking Input Circuit



Sourcing Input Circuit

OUTPUT SPECIFICATIONS:

# Channels:	up to 8
Output Voltage:	Module Dependent

AC Output Modules

AC Output Module MODEL:	ICM-HDMO-01	ICM-HDMO-02	ICM-HDMO-06
Line Voltage Nominal:	120 VAC	240 VAC	120/240 VAC
Operating Voltage Range:	12-140 VAC	24-280 VAC	24-280 VAC
Turn on Time:	1/2 Cycle Max*	1/2 Cycle Max*	1/2 Cycle Max*
Turn off Time:	1/2 Cycle Max**	1/2 Cycle Max**	1/2 Cycle Max**
Minimum Load Current:	20mA	20mA	20mA
Operating Frequency:	25-65 Hz	25-65 Hz	25-65 Hz
Operating Temp:	-30 to 70 deg. C	-30 to 70 deg. C	-30 to 70 deg. C
Isolation (Input to Output):	4000VRMS	4000VRMS	4000VRMS
Off State Leakage Current:	5mA	2.5mA	5mA
Peak Repetitive Voltage:	500VAC	500VAC	500VAC
Output Voltage Drop Max:	1.6VAC	1.6VAC	1.6VAC
One Cycle Surge:	80A Peak	80A Peak	80A Peak

* @ Zero Voltage
** @ Zero Current

Data Sheet

DC Output Modules

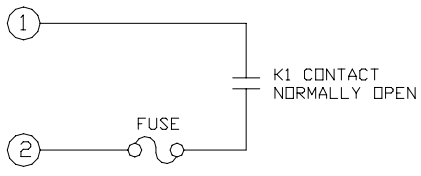
DC Output Module MODEL:	ICM-HDMO-03	ICM-HDMO-04
Line Voltage Max:	60 VDC	200 VDC
Operating Voltage Range:	5-60 VDC	5-200 VDC
Turn on Time:	100µSec	100µSec
Turn off Time:	750µSec	750µSec
One Second Surge:	5A	5A
Output Voltage Drop Max:	1.6VDC	1.6VDC
Operating Temp:	-30 to 70 deg. C	-30 to 70 deg. C
Isolation (Input to Output):	4000VRMS	4000VRMS
Off State Leakage Current:	1mA	2mA

Relay Output Modules

Relay Output Module MODEL:	ICM-HDMO-05
Contact Form:	Form A, SPST Normally Open
Contact Rating:	10 VA
Turn on Time:	500µSec
Turn off Time:	500µSec
Contact Bounce:	250µSec
Contact On Resistance:	200 milliOhms
Operating Temp:	0 to 70 deg. C
Isolation (Input to Output):	1500 VDC
Switching Volts:	100VDC / 130VAC Max
Switching Current:	.5 Amperes Max
Carry Current:	1.5A Max
Mechanical Life:	5 x 106 Cycles

TYPICAL RELAY OUTPUT CIRCUIT DIAGRAMS

Typical Relay Module Output Circuit



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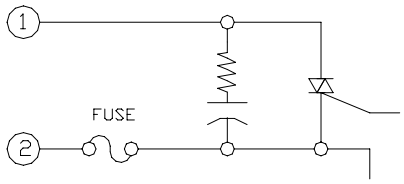
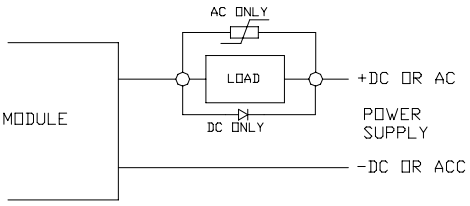
TYPICAL OUTPUT CIRCUIT DIAGRAMS

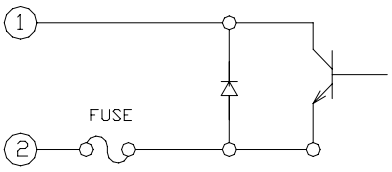
Typical AC Module Output Circuit

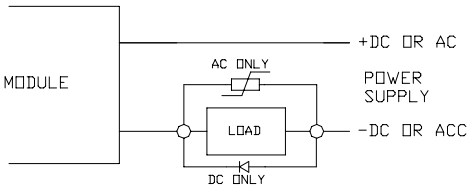




Sinking Module Output Circuit

Typical DC Module Output Circuit



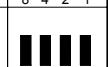
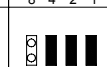
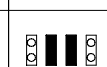
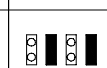
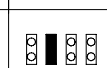
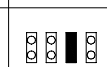
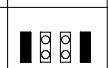
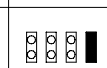
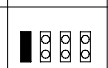


Sourcing Module Output Circuit

Data Sheet

Addressing I/O Points

The I/O is addressed into "pages". Each "page" represents 16 inputs and 16 outputs. The HDIO-20P addresses a "half page". It may be addressed to any page 0 through 7. Limitations apply when connected to a *Bear Bones*, *Baby Bear Bones* or *High Density Bear Bones* CPU. When connected to these CPUs, the HDIO may **NOT** be addressed on "Page 1". "Page" selection is done via programming shunts "Address Selector(s) 1,2,4,8". See page selection to the right for more details. ***Note: Some models may only use selectors 1,2,4. Page 6 cannot be address when HDIO is used with PIC-AB-01.***

Card Page Address	Card Paging Shunts (Address Selector) 8 4 2 1	U/L Selector Lower / Upper	DIN/ DOUT 8 I/O Cards	DIN/ DOUT 16 I/O Cards	Card Page Address	Card Paging Shunts (Address Selector) 8 4 2 1	U/L Selector Lower / Upper	DIN/ DOUT 8 I/O Cards	DIN/ DOUT 16 I/O Cards
0			0-7 8-15	0-15	8			128-135 136-143	128-143
1			16-23 24-31	16-31	9			144-151 152-159	144-159
2			32-39 40-47	32-47	10			160-167 168-175	160-175
3			48-55 56-63	48-63	11			176-183 184-191	176-191
4			64-71 72-79	64-79	12			192-199 200-207	192-207
5			80-87 88-95	80-95	13			208-215 216-223	208-223
6			96-103 104-111	96-111	14			224-231 232-239	224-239
7			112-119 120-127	112-127	15			240-247 248-255	240-255

Power Consumption

Power Input Standby:	+5VDC @ 2mA Maximum
Power Input Origin:	Controller/Aux Powersupply via Cable 3
I/O Point Power Consumption:	
Activated Inputs:	1.7mA each input point (5V Supply) (additional)
Activated Outputs:	20mA each output point (5V Supply) (additional)

DATA CONNECTIONS

The data is received from the controller via a ribbon cable connected to Conn6. The controller provides all the addressing, data and selection signals necessary for complete operation.

MOUNTING & DIMENSIONS

Mounting Type:	Industry Standard DIN Rail NS 31 or NS 35
Dimensions:	
Width:	4.00 Inches
Length:	6.375 Inches
Depth:	2.5 Inches (including din rail mounting feet)

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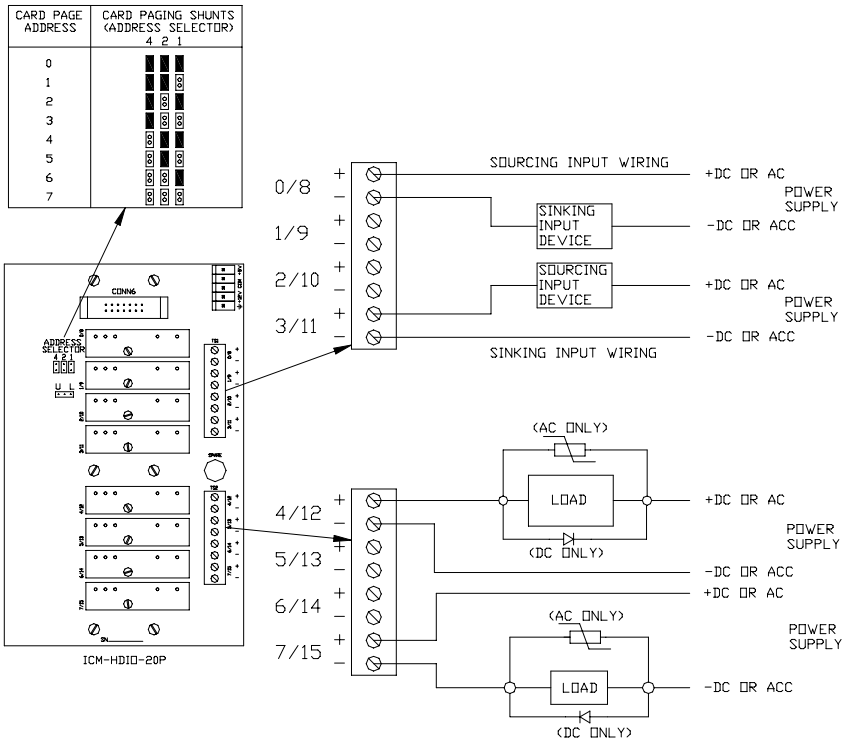
CONNECTIVITY DIAGRAMS

For additional Addressing, See Chart on Page 4.



Maximum Recommended wire size is 14 AWG.

CABLING

The ICM-HDIO-20P connects to any of the Divelbiss controllers using standard cable sets. See below for proper cable. Custom Cabling is also available.

Connect to Boss32, UCP, UMC and HDCPU.	
ICM-HDCA-01	Connects 1 Expander (9”)
ICM-HDCA-02	Connects 2 Expander (18”)
ICM-HDCA-03	Connects 3 Expander (27”)
ICM-HDCA-04	Connects 4 Expander (36”)
ICM-HDCA-05	Connects 5 Expander (45”)
ICM-HDCA-06	Connects 6 Expander (54”)

Connect to Boss Bear, Bear Bones, and Baby Bear Bones.	
ICM-HDCA-11	Connects 1 Expander (9”)
ICM-HDCA-12	Connects 2 Expander (18”)
ICM-HDCA-13	Connects 3 Expander (27”)
ICM-HDCA-14	Connects 4 Expander (36”)
ICM-HDCA-15	Connects 5 Expander (45”)
ICM-HDCA-16	Connects 6 Expander (54”)

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