Huron Net Works

DeviceNet DN-IDS16

Device Profile

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Revision # 1.2

Board Revision 1.1
Firmware Revision 1.1

Rev	Date	Note(s)
1.0	7/02/97	Original
1.1	7/05/97	Add Factory Test Class
1.2	7/17/97	Add FAULT to POLL Response

1.0 Object Model

The DN-IDS16 can accept up to sixteen PNP or NPN switches. It is derived from the Generic Device Profile (Device Type 0). In addition to the standard objects there is one vendor specific object which allows serial number and vendor ID to be programmed into the non-volitile memory.

1.1 Objects Present in Device

Object	Class ID	Optional/Required	# of Instances
Identity	0x01	Required	1
Message Router	0x02	Required	1
DeviceNet	0x03	Required	1
Assembly	0x04	Required	1
Connection	0x05	Required	2 (one I/O, one Explicit Messaging

1.2 Objects That Effect Behavior

Object	Effect on Behavior
Identity	Supports the Reset Service
Message Router	No Effect
DeviceNet	Configures Port Attributes
Assembly	Defines data format
Connection	Establishes the number of connections

1.3 Object Interfaces

Object	Interface
Identity	Message Router
Message Router	Explicit Message Connection Instance
DeviceNet	Message Router
Assembly	I/O Connection or Message Router
Connection	Message Router

1.4 Identification of I/O Assembly Instances

Number	Type	Name
1	Input	Device Inputs

1.5 Format of I/O Assembly Data Attribute

1.5.1 Assembly #1 -- Device Inputs

Byte	7	6	5	4	3	2	1	0
0	8A	7A	6A	5A	4A	3A	2A	1A
1	8B	7B	6B	5B	4B	3B	2B	1B
2	0	0	0	0	0	0	0	FAULT

The names of the bits in bytes 0 and one of this assembly correspond to the legend on the lexan overlay for the IDS16.

The FAULT bit is set whenever one or more of the connectors has Vs shorted to V-. It is cleared when the fault condition is removed.

2.0 Standard Objects

2.1 Identity Object (0x01)

There is a single instance of the identity object for the device. No class attributes are supported. All of the instance attributes are contained in ROM or EEPROM and are getable but not setable. The table below shows the values.

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Vendor	UINT	0x0014
2	Get	Device Type	UINT	0x0000
3	Get	Product Code	UINT	0x0008
4	Get	Revision	STRUCT	01.01
5	Get	Status	WORD	0x0000
6	Get	Serial #	UDINT	0x00001000*
7	Get	Product Name	STRUCT	5,"IDS16"

* -- Base Serial Number. Actual serial number is programmed at final assembly

Identity Object Services

Service Code	**Class Service**	**Instance Service**	**Service Name**	**Description**
0x05	No	Yes	Reset	Power on Reset
0x0E	No	Yes	Get Attribute Single	Return the value of the requested attribute

2.2 Message Router Object (0x02)

There is no externally visible interface to the Message Router Object.

2.3 DeviceNet Object (0x03)

There is a single instance of the DeviceNet Object for the device. One class attribute is supported which is the revision.

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	0x0002

DeviceNet Object Instance Attributes

Attribute ID	Access Rule	Name	Data Type	Value
1	Get/Set	MACID	USINT	EEPROM Default = 63
2	Get/Set	Baud Rate	USINT	EEPROM Default = 0
3	Get/Set	BOI	BOOL	0x00 Fault
4	Get/Set	Bus-Off Counter	USINT	0x00
5	Get	Allocation Information	STRUCT	Allocate Service

DeviceNet Object Services

Service Code	**Class Service**	**Instance Service**	**Service Name**	**Description**
0x0E	Yes	Yes	Get Attribute Single	Return the value of the requested attribute
0x10	No	Yes	Set Attribute Single	Sets the value of the requested attribute
0x4B	No	Yes	Allocate	Allocate instances of the predefined Master Slave connection Set
0x4C	No	Yes	Release	Release instances of the predefined Master Slave Connection Set.

2.4 Connection Object (0x05)

There are two instances of the Connection Object in the device. Instance #1 is assigned to the explicit messaging connection. Instance #2 is assigned to the Polled I/O connection. The tables below show the attributes and the predefined values where applicable.

Explicit Message Connection (Instance #1)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	state	USINT	0x03
2	Get	instance_type	USINT	0x00
3	Get	Xport Class trigger	USINT	0x83
4	Get	produced connection ID	UINT	0x5FB for MAC ID 63
5	Get	consumed connection ID	UINT	0x5FC for MAC ID 63
6	Get	initial comm characteristics	USINT	0x21
7	Get	produced connection size	UINT	0x0007
8	Get	consumed connection size	UINT	0x0007
9	Get/Set	expected packet rate	UINT	Application Dependent
10	N/A	N/A	N/A	Not Used
11	N/A	N/A	N/A	Not Used
12	Get	watchdog timeout action	USINT	0x01 Auto Delete
13	Get	produced path length	UINT	0x0000
14	Get	produced path	Array of USINT	<NULL>
15	Get	consumed path length	UINT	0x0000
16	Get	consumed path	Array of USINT	<NULL>
17	Attribute Not Supported	production inhibit timer	UINT	*

* Server devices do not use this timer

Poll I/O Message Connection (Instance #2)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	state	USINT	0x03
2	Get	instance_type	USINT	0x01
3	Get	Xport Class trigger	USINT	0x82
4	Get	produced connection ID	UINT	0x3FF for MAC ID 63
5	Get	consumed connection ID	UINT	0x5FD for MAC ID 63
6	Get	initial comm characteristics	USINT	0x01
7	Get	produced connection size	UINT	0x0002
8	Get	consumed connection size	UINT	0x0000
9	Get/Set	expected packet rate	UINT	Application Dependent
10	N/A	N/A	N/A	Not Used
11	N/A	N/A	N/A	Not Used
12	Get	watchdog timeout action	USINT	0x00 Time Out
13	Get	produced path length	UINT	0x0006
14	Get	produced path	Array of USINT	20.04.24.01.30.03
15	Get	consumed path length	UINT	0x0000
16	Get	consumed path	Array of USINT	<NULL>
17	Attribute Not Supported	production inhibit timer	UINT	*

* Server devices do not use this timer

Connection Object Services

Service Code	Class Service	Instance Service	Service Name	Description
0x05	No	Yes	Reset	Used to reset a connection in the timed-out state
0x0E	No	Yes	Get Attribute Single	Return the value of the requested attribute
0x10	No	Yes	Set Attribute Single	Sets the value of the requested attribute

3.0 Vendor Specific Objects

3.1 Factory Test Object (0xC4)

The factory test object has no class attributes, and it has no instance attributes. It does have class services which implement the following behaviors. Any required data follows the instance ID in an explicit message.

Factory Test Object Services

Service Code	Class Service	Instance Service	Service Name	Description
0x3C	No	Yes	Set Serial Number	Change the serial number in RAM for the Identity Object
0x40	No	Yes	Change Vendor Id	Change the vendor Id in RAM for the Identity Object
0x3B	No	Yes	Factory Lock	Copy vendor ID, serial number, baudrate and MACID to EEPROM
0x3A	No	Yes	Factory Unlock	Invalidate the EEPROM contents

Factory Test Class Example Messages
masterid = 1 && slaveid = 63

Message	Encoding
Change Vendor Id to 0x0015	[5FC]<01 40 C4 01 15 00>
Set Serial Number to 0xAA247301	[5FC]<41 3C C4 01 01 73 24 AA>
Factory Lock	[5FC]<01 3B C4 01>
Factory Unlock	[5FC]<41 3A C4 01>