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Piconet IO Data Mapping Reference Guide for DeviceNet™

TURCK Inc.

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Piconet IO Data Maps

SDNB - 0800D - 000x , 8DI

Input Data (2 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Input8	Discrete Input7	Discrete Input6	Discrete Input5	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1
1	Status Discrete Input8	Status Discrete Input7	Status Discrete Input6	Status Discrete Input5	Status Discrete Input4	Status Discrete Input3	Status Discrete Input2	Status Discrete Input1

SNNE - 0800D - 000x , 8DI

Input Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Input8	Discrete Input7	Discrete Input6	Discrete Input5	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1

SDNB - 0008D - 000x , 8DO

Input Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Status Discrete Output8	Status Discrete Output7	Status Discrete Output6	Status Discrete Output5	Status Discrete Output4	Status Discrete Output3	Status Discrete Output2	Status Discrete Output1

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Output8	Discrete Output7	Discrete Output6	Discrete Output5	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

SNNE - 0008D - 000x , 8DO

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Output8	Discrete Output7	Discrete Output6	Discrete Output5	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

SDNB - 0404D - 000x , 4DI4DO

Input Data (2 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Status Discrete Input4	Status Discrete Input3	Status Discrete Input2	Status Discrete Input1	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1
1	Res ¹	Res	Res	Res	Status Discrete Output4	Status Discrete Output3	Status Discrete Output2	Status Discrete Output1

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Res	Res	Res	Res	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

Note:

1 – Bit4 – 7, reserved bits accounted for and not used.

SNNE - 0404D - 000x , 4DI4DO

Input Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	- ²	-	-	-	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	-	-	-	-	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

Note:

2 – Bit4 – 7, not used and not accounted for.

SDNB - 0808D - 000x , 8DI8DO

Input Data (3 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Input8	Discrete Input7	Discrete Input6	Discrete Input5	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1
1	Status Discrete Input8	Status Discrete Input7	Status Discrete Input6	Status Discrete Input5	Status Discrete Input4	Status Discrete Input3	Status Discrete Input2	Status Discrete Input1
2	Status Discrete Output8	Status Discrete Output7	Status Discrete Output6	Status Discrete Output5	Status Discrete Output4	Status Discrete Output3	Status Discrete Output2	Status Discrete Output1

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Output8	Discrete Output7	Discrete Output6	Discrete Output5	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

SNNE - 0808D - 000x , 8DI8DO

Input Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Input8	Discrete Input7	Discrete Input6	Discrete Input5	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Output8	Discrete Output7	Discrete Output6	Discrete Output5	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

SDNB - 40A - 000x , 4AI

Input Data (9 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Analog input 1 Low Byte							
1	Analog input 1 High Byte							
2	Analog input 2 Low Byte							
3	Analog input 2 High Byte							
4	Analog input 3 Low Byte							
5	Analog input 3 High Byte							
6	Analog input 4 Low Byte							
7	Analog input 4 High Byte							
8	Res	Res	Res	Res	AI-4 Status	AI-3 Status	AI-2 Status	AI-1 Status

Output Data (0 Byte)

SNNE - 40A - 000x , 4AI

Input Data (8 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Analog input 1 Low Byte							
1	Analog input 1 High Byte							
2	Analog input 2 Low Byte							
3	Analog input 2 High Byte							
4	Analog input 3 Low Byte							
5	Analog input 3 High Byte							
6	Analog input 4 Low Byte							
7	Analog input 4 High Byte							

Output Data (0 Byte)

SDNB - 04A - 000x , 4AO

Input Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Res	Res	Res	Res	AI-4 Status	AI-3 Status	AI-2 Status	AI-1 Status

Output Data (8 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Analog output 1 Low Byte							
1	Analog output 1 High Byte							
2	Analog output 2 Low Byte							
3	Analog output 2 High Byte							
4	Analog output 3 Low Byte							
5	Analog output 3 High Byte							
6	Analog output 4 Low Byte							
7	Analog output 4 High Byte							

SNNE - 04A - 000x , 4AO

Input Data (0 Byte)

Output Data (8 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Analog output 1 Low Byte							
1	Analog output 1 High Byte							
2	Analog output 2 Low Byte							
3	Analog output 2 High Byte							
4	Analog output 3 Low Byte							
5	Analog output 3 High Byte							
6	Analog output 4 Low Byte							
7	Analog output 4 High Byte							

SDNB - 10S – 0001 , Incremental Encoder

Input Data (7 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Status							
1	Counter Data 0							
2	Counter Data 1							
3	Latch							
4	Period Data 0							
5	Period Data 1							
6	Device Status							

Device Status:

\$ bit0 = Internal bus error
 \$ bit1 = Configuration error
 \$ bit2 = reserved
 \$ bit3 = reserved
 \$ bit4 = reserved
 \$ bit5 = reserved
 \$ bit6 = Bus Sense Error
 \$ bit7 = Fieldbus error / Idle mode

Output Data (6 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Control							
1	Data 0							
2	Data 1							
3	Reserved							
4	Reserved							
5	Reserved							

SNNE - 10S – 0001 , Incremental Encoder

Input Data (6 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Status							
1	Counter Data 0							
2	Counter Data 1							
3	Latch							
4	Period Data 0							
5	Period Data 1							

Output Data (6 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Control							
1	Data 0							
2	Data 1							
3	Reserved							
4	Reserved							
5	Reserved							

SDNB - 10S - 0002 / 0003 / 0004

RS232 / (TTY) / RS422 & RS485

Input Data (7 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Status							
1	Data 0							
2	Data 1							
3	Data 2							
4	Data 3							
5	Data 4							
6	Device Status							

Device Status:

\$ bit0 = Internal bus error
\$ bit1 = Configuration error
\$ bit2 = reserved
\$ bit3 = reserved
\$ bit4 = reserved
\$ bit5 = reserved
\$ bit6 = Bus Sense Error
\$ bit7 = Fieldbus error / Idle mode

Output Data (6 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Control							
1	Data 0							
2	Data 1							
3	Data 2							
4	Data 3							
5	Data 4							

SNNE - 10S - 0002 / 0003 / 0004

RS232 / (TTY) / RS422 & RS485

Input Data (6 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Status							
1	Data 0							
2	Data 1							
3	Data 2							
4	Data 3							
5	Data 4							

Output Data (6 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Serial Interface Control							
1	Data 0							
2	Data 1							
3	Data 2							
4	Data 3							
5	Data 4							

SDNB - 10S - 0005 , SSI Interface

Input Data (5 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Data 0							
1	Data 1							
2	Data 2							
3	Data 3							
4	Device Status							

Data format:

Format	Bit 31					Bit 0
UDINT		Data 3	Data 2	Data 1	Data 0	

Device Status:

- \$ bit0 = Internal bus error
- \$ bit1 = Configuration error
- \$ bit2 = reserved
- \$ bit3 = reserved
- \$ bit4 = reserved
- \$ bit5 = reserved
- \$ bit6 = Bus Sense Error
- \$ bit7 = Fieldbus error / Idle mode

SNNE - 10S - 0005 , SSI Interface

Input Data (4 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0								Data 0
1								Data 1
2								Data 2
3								Data 3

Data format:

Format	Bit 31				Bit 0
UDINT	Data 3	Data 2	Data 1	Data 0	

SDNB – 0202D – 0003 , Up/Down Counter

Input Data (11 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter 1 (C1) Communication Status							
1	C1 Data 0							
2	C1 Data 1							
3	C1 Data 2							
4	C1 Data 3							
5	Counter 2 (C2) Communication Status							
6	C2 Data 0							
7	C2 Data 1							
8	C2 Data 2							
9	C2 Data 3							
10	Res	Res	Res	Res	Res	Res	C2 Device Status	C1 Device Status

Device Status

Bit	Function
0	No fault
1	Device Faulted

Output Data (10 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter 1 (C1) Control							
1	C1 Data 0							
2	C1 Data 1							
3	C1 Data 2							
4	C1 Data 3							
5	Counter 2 (C2) Control							
6	C2 Data 0							
7	C2 Data 1							
8	C2 Data 2							
9	C2 Data 3							

SNNE - 0202D - 0003 , Up/Down Counter

Input Data (10 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter 1 (C1) Communication Status							
1	C1 Data 0							
2	C1 Data 1							
3	C1 Data 2							
4	C1 Data 3							
5	Counter 2 (C2) Communication Status							
6	C2 Data 0							
7	C2 Data 1							
8	C2 Data 2							
9	C2 Data 3							

Output Data (10 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter 1 (C1) Control							
1	C1 Data 0							
2	C1 Data 1							
3	C1 Data 2							
4	C1 Data 3							
5	Counter 2 (C2) Control							
6	C2 Data 0							
7	C2 Data 1							
8	C2 Data 2							
9	C2 Data 3							

Coupler Module

SDNL - 0404D - 000x Data Map

Input Data (2 Bytes)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	-	-	-	-	Discrete Input4	Discrete Input3	Discrete Input2	Discrete Input1
1	Status Byte							

Status:

\$ bit0 = Internal bus error
 \$ bit1 = Configuration error
 \$ bit2 = reserved
 \$ bit3 = reserved
 \$ bit4 = reserved
 \$ bit5 = reserved
 \$ bit6 = Bus Sense Error
 \$ bit7 = Fieldbus error / Idle mode

Output Data (1 Byte)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	-	-	-	-	Discrete Output4	Discrete Output3	Discrete Output2	Discrete Output1

Data Mapping of Coupler and Extension Modules

The byte oriented data represents data of the analog or special function IO modules. The bit oriented data represents data of the discrete IO modules.

The input data map of the coupler module consists of byte oriented input data, followed by the bit oriented input data and the coupler status byte at the end.

The output data map of the coupler consists of byte oriented output data, followed by the bit oriented output data.

Input Data

The input (produced) data which is transferred from the SDNL-0404D-000x (coupler) to the DeviceNet master / scanner start with byte-oriented input data of the analog input and/or special signal extension modules. The bit-oriented data of the coupler module and the digital inputs of the extension modules are mapped after the byte-oriented data. If the total number of digital inputs is not a multiple of 8, there will be a number of the padding bits in the last data byte. These bits are not used but are accounted for. An extra coupler status byte is mapped at the end of the input data map.

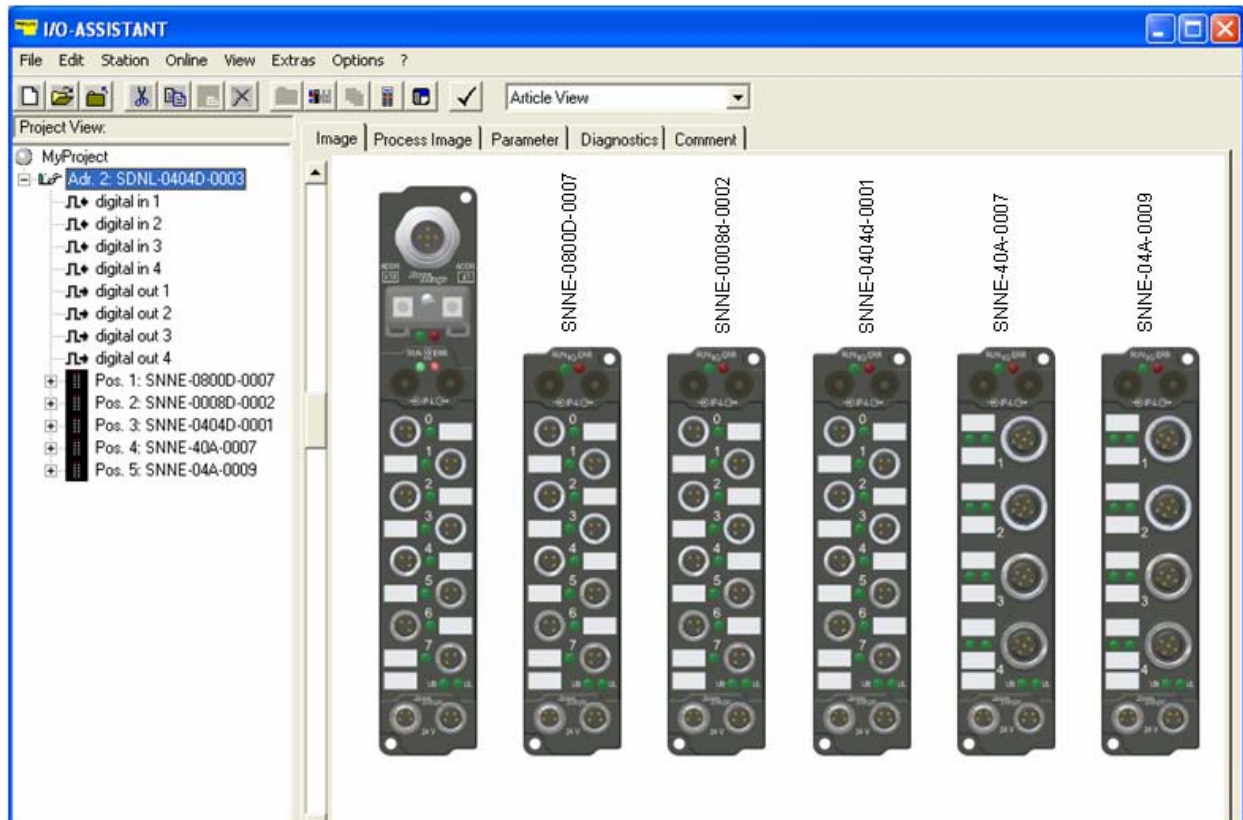
The status byte provide following information:

- Bit0: IPLink_Error : IO Error, Coupler internal data exchange fault
- Bit1: SDNL_Cfg : Coupler Configuration Error
- Bit2: reserved
- Bit3: Diag : Diagnostics of an analog module
- Bit4: reserved
- Bit5: reserved
- Bit6: reserved
- Bit7: FB_Error : Fieldbus Error / Idle Mode

Output Data

The output (consumed) data which is transferred from the DeviceNet Master / Scanner to the SDNL-0404D-000x begins with byte-oriented output data which is the data for the analog output and special signal extension modules. The bit-oriented data for the digital outputs of the SDNL-0404D-000x and the digital output extension modules is mapped after the byte-oriented data. If the total number of digital outputs is not a multiple of 8, there will be a number of the padding bits in the last data byte. These bits are not used but are accounted for

Mapping example:



Input data map – 11 bytes:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
I : 1.1	SNNE-40A-0007, Analog Input 1															
I : 1.2	SNNE-40A-0007, Analog Input 2															
I : 1.3	SNNE-40A-0007, Analog Input 3															
I : 1.4	SNNE-40A-0007, Analog Input 4															
I : 1.5	SNNE-0404D-0001				SNNE-0800D-0007								SDNL-0404			
I : 1.6	SDNL-0404D-0003 Status byte															
I : 1.7																
I : 1.8																

Output data map – 10 bytes:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
O : 1.1	SNNE-04A-0009, Analog Output 1															
O : 1.2	SNNE-04A-0009, Analog Output 2															
O : 1.3	SNNE-04A-0009, Analog Output 3															
O : 1.4	SNNE-04A-0009, Analog Output 4															
O : 1.5	Not used - padding				SNNE-0008D-0007								SDNL-0404			
O : 1.7																
O : 1.8																