



## Mixed DC I/O Module

16 Input / 16 Output Channels

*SmartStix*

**HE550DIQ811 / HE559DIQ811**  
**12/24 Vdc In, Positive/Negative Logic**  
**24Vdc Out, Negative Logic**  
**HE559DIQ816**  
**12/24 Vdc In, Positive Logic**  
**24Vdc Out, Positive Logic**

For electronic information, see [www.HornerOCS.com](http://www.HornerOCS.com). Programming information is contained in the Control Station Hardware Manual (MAN0227).

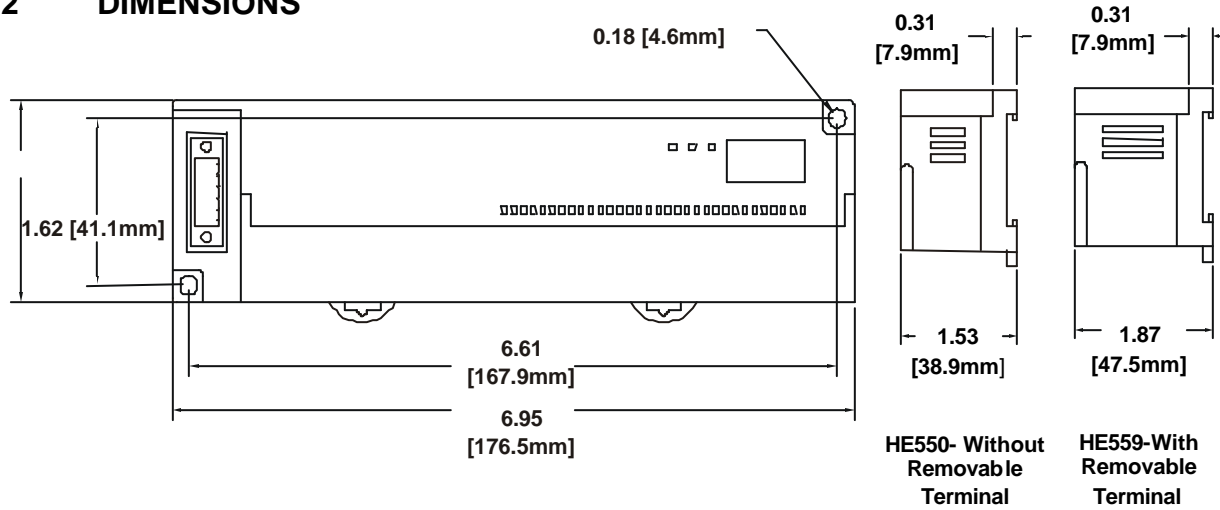
HE550 denotes a non-removable terminal strip; HE559 denotes a removable terminal strip.

### 1 SPECIFICATIONS

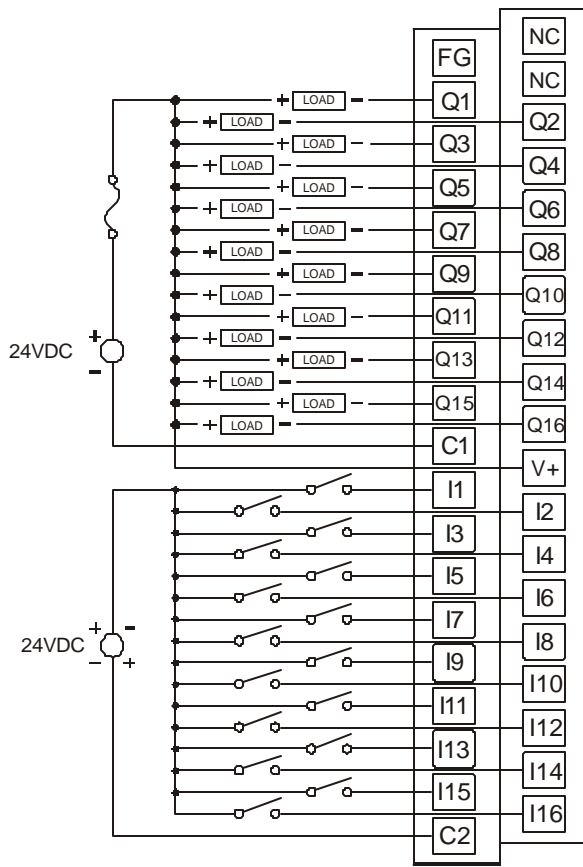
DIQ811 / 816 IN				
Number of input points	16	OFF to ON Response	0 - 3ms. or less	
Rated Input Current	7mA	ON to OFF Response	0 - 3ms. or less	
ON Voltage Level	19VDC or less	Common Terminal	16 points / COM	
OFF Voltage Level	6VDC or less	Operating Indicator	LED turns on during ON state of input	
Input Characteristics	Bidirectional	External Connections	Terminal block connector (M3 x 6 screws)	
Isolation Method	Photo Coupler			
DIQ811 / 816 OUT				
Number of output points	16	External Power Supply	Voltage	24VDC $\pm$ 10%(ripple voltage: 4Vp-p or less)
Commons per Module	1		Current	30mA (TYP, All points ON)
Operating Voltage	24VDC	OFF to ON Response	2ms.	
Rated Load Voltage	24VDC	ON to OFF Response	2ms.	
Max. Load Current per channel	DIQ 811	0.1A Max. per output 2A per common	Output Type	DIQ811 Sinking
				DIQ816 Sourcing
	DIQ 816	0.5A Max. per output 3A per common	Max. Inrush Current per channel	DIQ811 0.4A, 10ms.
				DIQ816 1A, 10ms
OFF Leakage Current	0.1mA or less	Common Method	16 points / COM	
Internal power Consumption (mA)	350	Weight	DIQ811	8.40 oz. (238 g)
			DIQ816	10.16 oz. (288 g)

GENERAL				
Storage Temperature	-25° to 70° C	Altitude for use	Up to 2,000m	
Operating Temperature	0° to 55° C	Operating and Storage Humidity	5 to 95% Non-condensing	
Atmosphere	Free from corrosive gases and excessive dust	Pollution degree	2 or lower	
Cooling method	Self-cooling			
Vibration				
Occasional Vibration				
Frequency	Acceleration	Amplitude	Sweep Count	
10 ≤ f < 57 Hz	-	0.075 mm	10 times in each direction for X,Y,Z	
57 ≤ f ≤ 150 Hz	9.8 m/s <sup>2</sup> {1G}	-		
Continuous Vibration				
Frequency	Acceleration	Amplitude	Sweep Count	
10 ≤ f < 57 Hz	-	0.035 mm	10 times in each direction for X,Y,Z	
57 ≤ f ≤ 150 Hz	4.9 m/s <sup>2</sup> {0.5G}	-		
Shocks				
Maximum shock acceleration	147 m/s <sup>2</sup> {15G}			
Duration Time	11 ms.			
Pulse Wave	Half sine wave pulse (3 times in each of X, Y, Z directions)			
Noise Immunity				
Square wave impulse noise	AC: ± 1,500VDC DC: ± 900VDC			
Electrostatic Discharge	Voltage: 4kV (contact discharge)			
Radiated electromagnetic field	27 – 500MHz, 10V/m			
Fast Transient Burst Noise	Severity level	All power modules	Digital I/Os (Ue ≥ 24V)	Digital I/Os (Ue < 24 V) Analog I/Os Communication I/Os
	Voltage	2 kV	1 kV	0.25 kV

## 2 DIMENSIONS



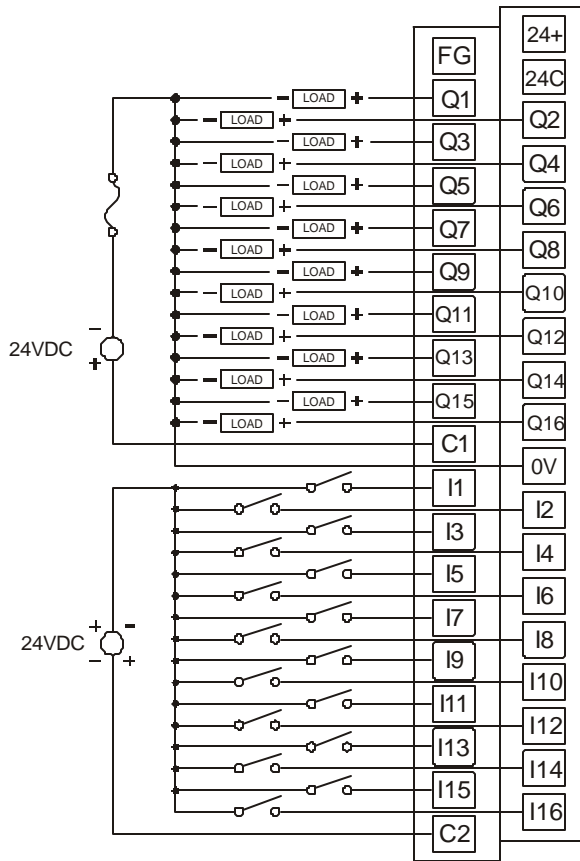
## 3 WIRING



006DIQ003

DIQ811	
FG	Frame Ground
Q1	Output 1
Q3	Output 3
Q5	Output 5
Q7	Output 7
Q9	Output 9
Q11	Output 11
Q13	Output 13
Q15	Output 15
C1	Isolated Common
I1	Input 1
I3	Input 3
I5	Input 5
I7	Input 7
I9	Input 9
I11	Input 11
I13	Input 13
I15	Input 15
C2	Isolated Common

DIQ811	
NC*	No Connection (*Do not Connect)
NC*	No Connection (*Do not connect)
Q2	Output 2
Q4	Output 4
Q6	Output 6
Q8	Output 8
Q10	Output 10
Q12	Output 12
Q14	Output 14
Q16	Output 16
V+	Isolator Power
I2	Input 2
I4	Input 4
I6	Input 6
I8	Input 8
I10	Input 10
I12	Input 12
I14	Input 14
I16	Input 16



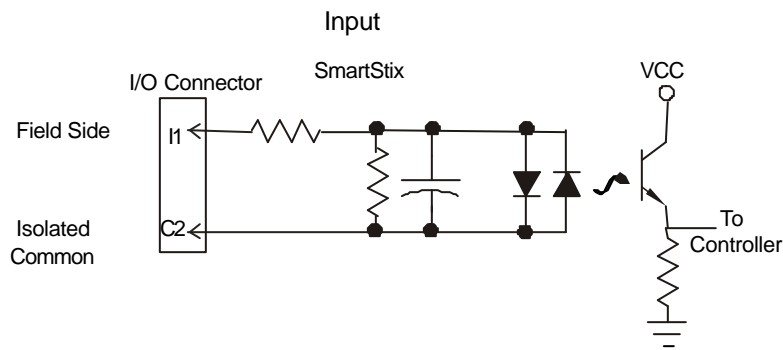
006DIQ004

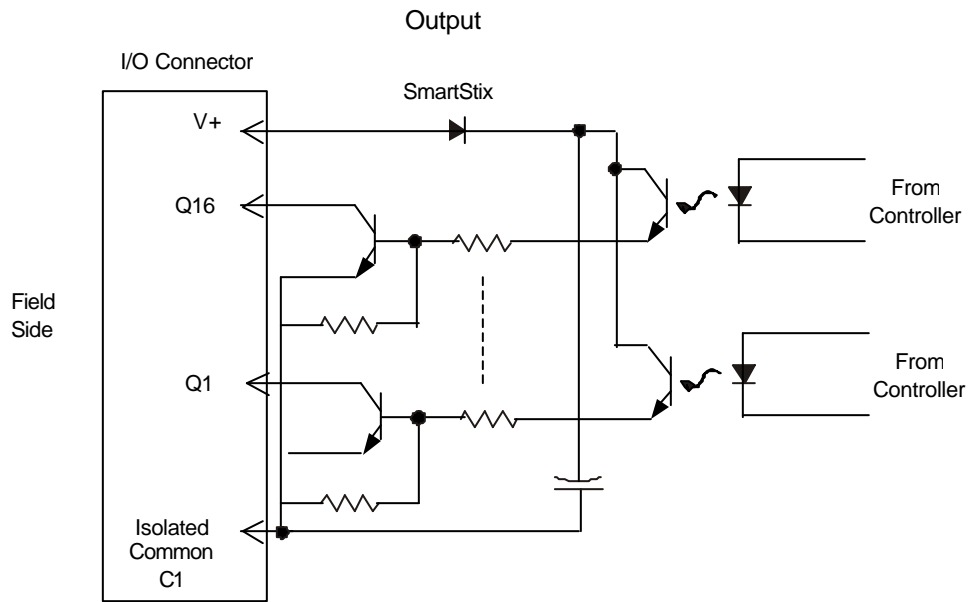
DIQ816	
FG	Frame Ground
Q1	Output 1
Q3	Output 3
Q5	Output 5
Q7	Output 7
Q9	Output 9
Q11	Output 11
Q13	Output 13
Q15	Output 15
C1	Isolated Common Power
I1	Input 1
I3	Input 3
I5	Input 5
I7	Input 7
I9	Input 9
I11	Input 11
I13	Input 13
I15	Input 15
C2	Isolated Common

DIQ816	
24V+	24V+ Power
24C	24V+ Common
Q2	Output 2
Q4	Output 4
Q6	Output 6
Q8	Output 8
Q10	Output 10
Q12	Output 12
Q14	Output 14
Q16	Output 16
0V	Isolated Ground
I2	Input 2
I4	Input 4
I6	Input 6
I8	Input 8
I10	Input 10
I12	Input 12
I14	Input 14
I16	Input 16

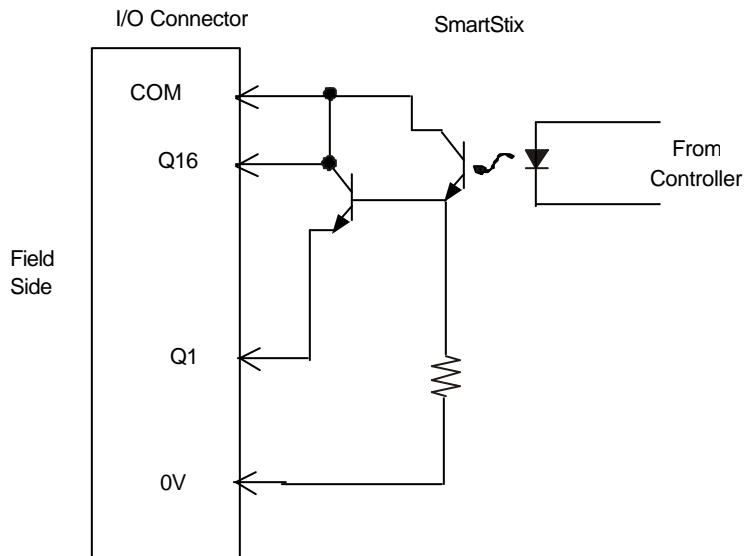
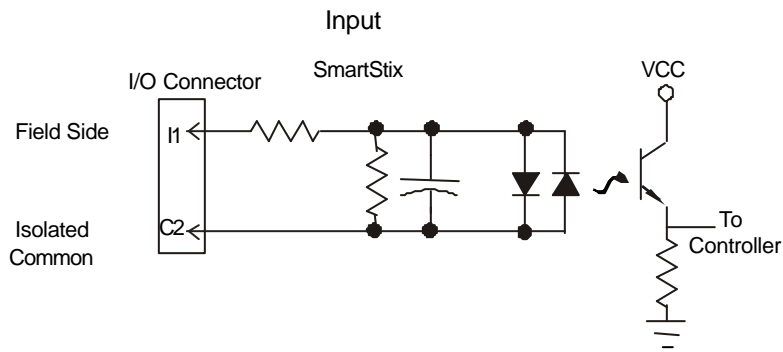
## 4 INTERNAL WIRING

### a. DIQ811



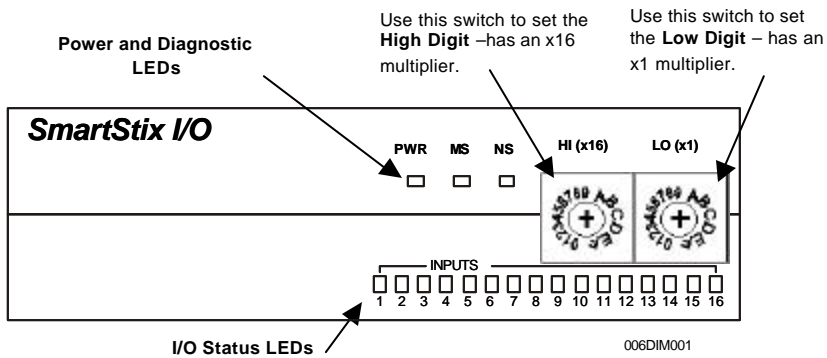


b. DIQ816



## 5 SETTING ID SWITCHES

CsCAN Network IDs are set using the hexadecimal number system from 01 to FD. The decimal equivalent is 1-253. Refer to following table which contains the decimal equivalent of hexadecimal numbers. Set a unique Network ID by inserting a small Phillips screwdriver into the two *identical* switches. **Note:** The CsCAN Baud Rate for SmartStix I/O is fixed at 125Kbaud.



Close-up of Switches

Decimal (Dec) to Hexadecimal (Hex) Conversion																
Dec	Hex		Dec	Hex		Dec	Hex		Dec	Hex	Dec	Hex		Dec	Hex	
	HI	LO		HI	LO		HI	LO				HI	LO		HI	LO
			54	3	6	108	6	C	162	A	2	216	D	8		
1	0	1	55	3	7	109	6	D	163	A	3	217	D	9		
2	0	2	56	3	8	110	6	E	164	A	4	218	D	A		
3	0	3	57	3	9	111	6	F	165	A	5	219	D	B		
4	0	4	58	3	A	112	7	0	166	A	6	220	D	C		
5	0	5	59	3	B	113	7	1	167	A	7	221	D	D		
6	0	6	60	3	C	114	7	2	168	A	8	222	D	E		
7	0	7	61	3	D	115	7	3	169	A	9	223	D	F		
8	0	8	62	3	E	116	7	4	170	A	A	224	E	0		
9	0	9	63	3	F	117	7	5	171	A	B	225	E	1		
10	0	A	64	4	0	118	7	6	172	A	C	226	E	2		
11	0	B	65	4	1	119	7	7	173	A	D	227	E	3		
12	0	C	66	4	2	120	7	8	174	A	E	228	E	4		
13	0	D	67	4	3	121	7	9	175	A	F	229	E	5		
14	0	E	68	4	4	122	7	A	176	B	0	230	E	6		
15	0	F	69	4	5	123	7	B	177	B	1	231	E	7		
16	1	0	70	4	6	124	7	C	178	B	2	232	E	8		
17	1	1	71	4	7	125	7	D	179	B	3	233	E	9		
18	1	2	72	4	8	126	7	E	180	B	4	234	E	A		
19	1	3	73	4	9	127	7	F	181	B	5	235	E	B		
20	1	4	74	4	A	128	8	0	182	B	6	236	E	C		
21	1	5	75	4	B	129	8	1	183	B	7	237	E	D		
22	1	6	76	4	C	130	8	2	184	B	8	238	E	E		
23	1	7	77	4	D	131	8	3	185	B	9	239	E	F		
24	1	8	78	4	E	132	8	4	186	B	A	240	F	0		
25	1	9	79	4	F	133	8	5	187	B	B	241	F	1		
26	1	A	80	5	0	134	8	6	188	B	C	242	F	2		
27	1	B	81	5	1	135	8	7	189	B	D	243	F	3		
28	1	C	82	5	2	136	8	8	190	B	E	244	F	4		
29	1	D	83	5	3	137	8	9	191	B	F	245	F	5		
30	1	E	84	5	4	138	8	A	192	C	0	246	F	6		
31	1	F	85	5	5	139	8	B	193	C	1	247	F	7		
32	2	0	86	5	6	140	8	C	194	C	2	248	F	8		
33	2	1	87	5	7	141	8	D	195	C	3	249	F	9		
34	2	2	88	5	8	142	8	E	196	C	4	250	F	A		
35	2	3	89	5	9	143	8	F	197	C	5	251	F	B		
36	2	4	90	5	A	144	9	0	198	C	6	252	F	C		
37	2	5	91	5	B	145	9	1	199	C	7	253	F	D		
38	2	6	92	5	C	146	9	2	200	C	8					
39	2	7	93	5	D	147	9	3	201	C	9					
40	2	8	94	5	E	148	9	4	202	C	A					
41	2	9	95	5	F	149	9	5	203	C	B					
42	2	A	96	6	0	150	9	6	204	C	C					
43	2	B	97	6	1	151	9	7	205	C	D					
44	2	C	98	6	2	152	9	8	206	C	E					
45	2	D	99	6	3	153	9	9	207	C	F					
46	2	E	100	6	4	154	9	A	208	D	0					
47	2	F	101	6	5	155	9	B	209	D	1					
48	3	0	102	6	6	156	9	C	210	D	2					
49	3	1	103	6	7	157	9	D	211	D	3					
50	3	2	104	6	8	158	9	E	212	D	4					
51	3	3	105	6	9	159	9	F	213	D	5					
52	3	4	106	6	A	160	A	0	214	D	6					
53	3	5	107	6	B	161	A	1	215	D	7					

## 6 LEDS

SmartStix I/O Modules provide diagnostic and status LED indicators.

### a. Diagnostic LED Indicators

Diagnostic LED	State	Meaning
<b>MS</b> (indicates fault status of the Module)	Solid Red	RAM or ROM test failed
	Blinking Red	I/O test failed
	Blinking Green	Module is in power-up state
	Solid Green	Module is running normally
<b>NS</b> (indicates fault status of the Network)	Solid Red	Network Ack or Dup ID test failed
	Blinking Red	Network ID test failed
	Blinking Green	Module is in Life Expectancy default state
	Solid Green	Network is running normally

### b. Status LED Indicators

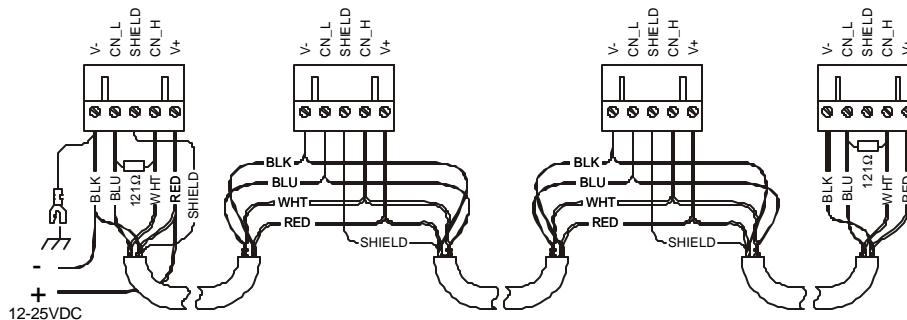
The Power Status LED illuminates Red when power is applied to the module. There are I/O Status LED indicators for each of the Digital I/O points, which illuminate Red when an I/O point is ON.

## 7 NETWORK CABLE

For detailed wiring information, refer to Chapter Two in the **Control Station Hardware Manual** (MAN0227). A handy checklist is provided that covers panel box layout requirements and minimum clearances.

Pin	Description
1	V+
2	CAN_H
3	Shield
4	CAN_L
5	V-

Recommended Cable	
Thick: (Max Distance = 500m)	Belden 3082A
Thin: (Max Distance = 100m)	Belden 3084A



**Note:** 12 - 24VDC must be supplied to the network.



## 8 INSTALLATION / SAFETY

- a. All applicable codes and standards need to be followed in the installation of this product.
- b. For I/O wiring (discrete), use the following wire type or equivalent: Belden 9918, 18 AWG or larger.
- c. For detailed installation information, refer to Chapter Two in the Control Station Hardware Manual (MAN0227). A handy checklist is provided that covers panel box layout requirements and minimum clearances.



**Warning:** Consult user documentation.



**Warning:** Electrical Shock Hazard.

## 9 TECHNICAL ASSISTANCE

For assistance, contact Technical Support at the following locations:

### North America:

(317) 916-4274  
[www.heapg.com](http://www.heapg.com)

### Europe:

(+) 353-21-4321-266  
[www.horner-apg.com](http://www.horner-apg.com)

NOTES