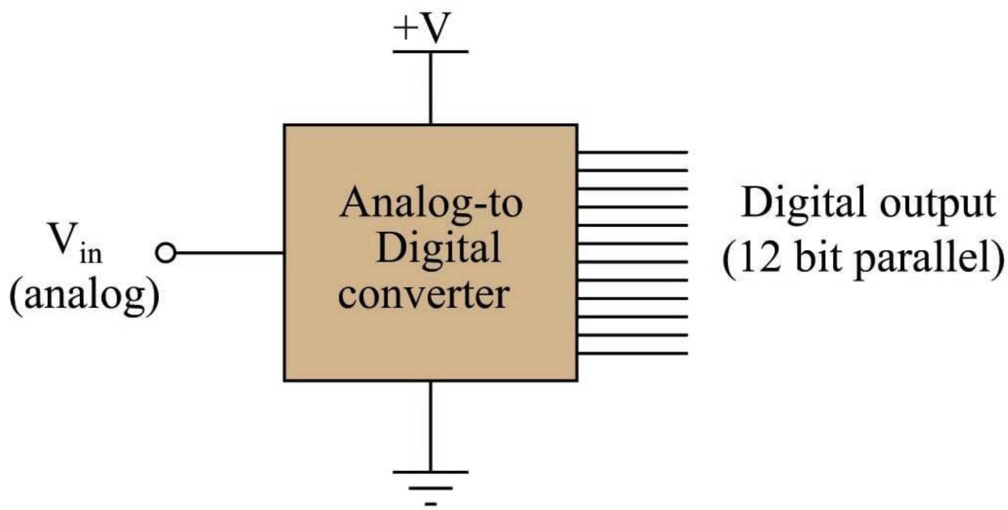
$$\% \text{ signal} = \frac{\text{(mA reading) - 4ma}}{\text{20mA - 4mA}} = \frac{\text{(signal count) - (4mA count)}}{\text{(ADC max count) - (4mA count)}} = \frac{\text{reading - (live zero)}}{\text{span of reading}}$$

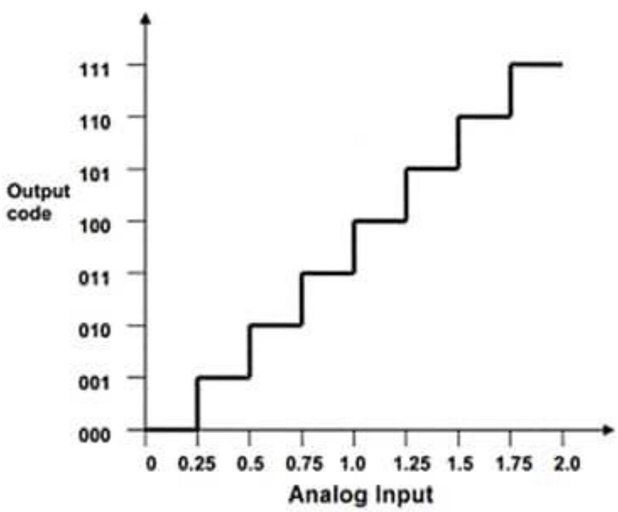
ADC count = @20mA = 31,208 counts / 20mA = 1560.4 counts per mA

$$4\text{mA} = \frac{\text{1560 counts}}{\text{1mA}} * 4\text{mA} = 6240 \text{ counts}$$

$$\% \text{ signal} = \frac{\text{(signal count) - (4mA count)}}{\text{(ADC max count) - (4mA count)}} = \frac{\text{(signal count) - (6240 counts)}}{\text{(31208 counts) - (6240 counts)}} = \frac{\text{(signal count) - (6240)}}{24968}$$

Analog to Digital Convertor (ADC)





Analog Data Format

The data returned from the analog-to-digital converter in the module is 12-bit resolute. This value is left-justified into a 16-bit field, reserving the most significant bit for a sign bit.

Input

A/D Unipolar Data		11	10	09	08	07	06	05	04	03	02	01	00			
		⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓			
Analog Value	0*	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

* = Always positive

A/D Bipolar Data	S	10	09	08	07	06	05	04	03	02	01	00				
	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓				
Analog Value	S	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

Output

D/A Data	S	11	10	09	08	07	06	05	04	03	02	01	00			
	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓	⇓			
Analog Value	S	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

Current (mA)	4-20mA Mode	0-20mA Mode	Voltage (V)	±10 Volt Mode		0-10 Volt Mode
				Input	Output	
			-10.50	8000	8000	
0.00		0000	-10.00	8620	8618	
1.00		0618	-9.00	9250	9248	
2.00		0C30	-8.00	9E80	9E78	
3.00		1248	-7.00	AAB0	AAA8	
4.00	0000	1860	-6.00	B6E0	B6D8	
5.00	0787	1E78	-5.00	C310	C310	
6.00	0F0F	2490	-4.00	CF40	CF40	
7.00	1696	2AA8	-3.00	DB70	DB70	
8.00	1E1E	30C0	-2.00	E7A0	E7A0	
9.00	25A5	36D8	-1.00	F3D0	F3D0	
10.00	2D2D	3CF0	0.00	0000	0000	0000
11.00	34B4	4310	1.00	0C30	0C30	0C30
12.00	3C3C	4928	2.00	1860	1860	1860
13.00	43C3	4F40	3.00	2490	2490	2490
14.00	4B4B	5558	4.00	30C0	30C0	30C0
15.00	52D2	5B70	5.00	3CF0	3CF0	3CF0
16.00	5A5A	6188	6.00	4920	4928	4928
17.00	61E1	67A0	7.00	5550	5558	5558
18.00	6969	6DB8	8.00	6180	6188	6188
19.00	70F0	73D0	9.00	6DB0	6DB8	6DB8
20.00	7878	79E8	10.00	79E0	79E8	79E8
21.00	7FFF	7FF8	10.50	7FF0	7FF8	7FF8

0-20mA
3mA 4,680
4mA 6,240
8mA 12,480
12mA 18,728
16mA 24,968
20mA 31,208
21mA 32,760
30,840