HALLSENSOREV1 USER GUIDE

DESCRIPTION

The HALLSENSOREV1, Figure 1, is a PCB constructed using an FR4 base for demonstrating various Diodes Inc Hall sensor devices in a sales environment. There are on-board LEDs to show the operation of the devices, as well as test points to connect an oscilloscope or multimeter.

The board is operated from a PP3 9V battery, fitted to the underside, and has a diode fitted for reverse polarity protection. The power switch is at the top right hand corner of the board.

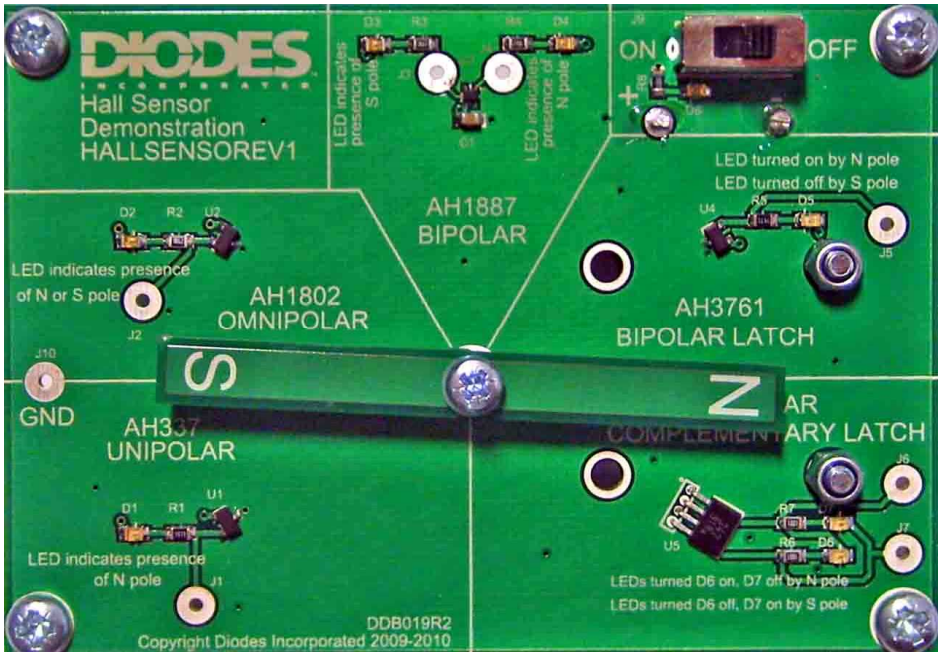


Figure 1: HALLSENSOREV1 Demonstration board

Once the board is switched on, the Hall sensor devices will respond to magnetic fields, which can either be introduced by an external magnet, or by turning the magnet rotor arm to place the N or S fields over each Hall sensor device.

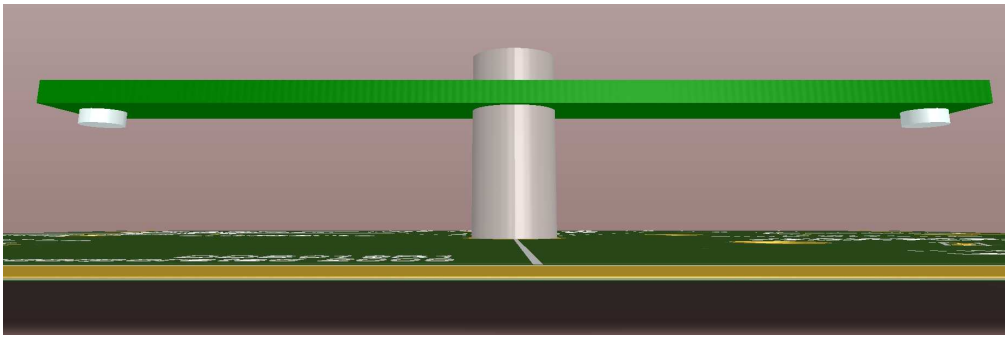


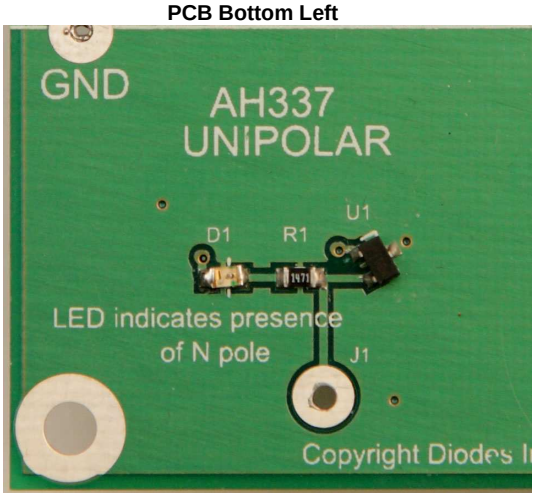
Figure 2: Magnet rotor arm

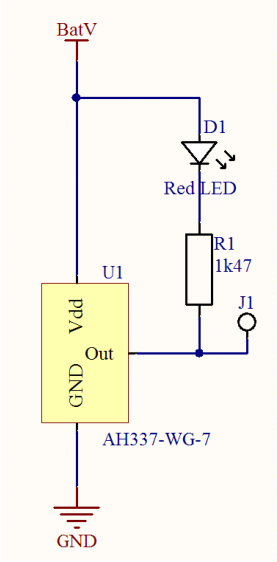
The magnet rotor arm (figure 2) is simply a swiveling arm that is fitted with two magnets. It is marked on the top side with the pole of the magnet that is pointed downward toward the device – N at one end of the arm, S at the other. This shows the behaviour of each device in the presence of an N or S field.

When a device is activated by the magnetic field, LEDs on the board will light to show what the device outputs are doing. The outputs are also available on test points.

AH337 UNIPOLAR - http://www.diodes.com/products/catalog/detail.php?item-id=1796

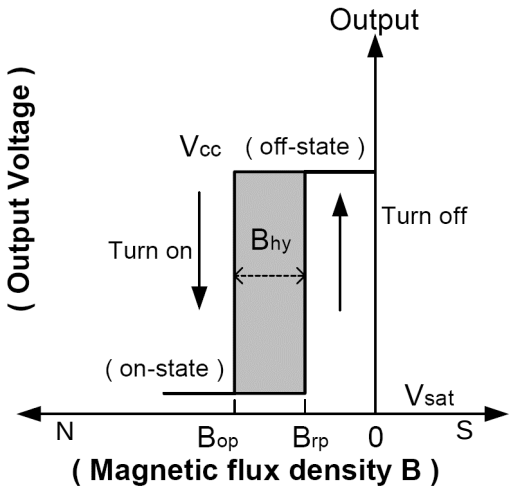
PCB Bottom Left





Figures 3&4: AH337 Circuit

AH337 is a Unipolar Device. The output will be switched on (active low) when a N pole is placed over the device (Please note the package orientations in the datasheet). The output does not latch, nor respond to a S field. The red LED adjacent to the AH337 will illuminate when a strong enough N field is present.



Parameter	Typical Value/range	Unit
Bop	-120	Gauss
Brp	-60	Gauss
Vsat	300	mV
Vdd	4.2 – 28	V

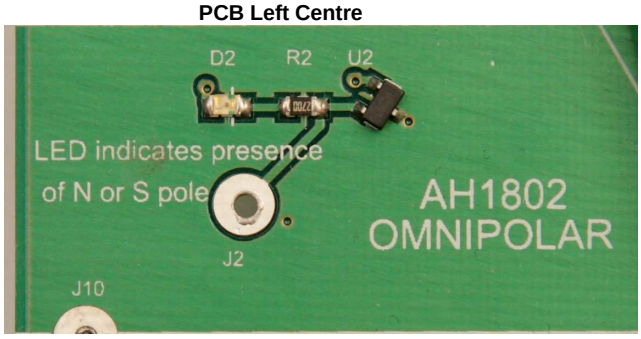
Figure 5 & Table 1: AH337 Operating characteristics

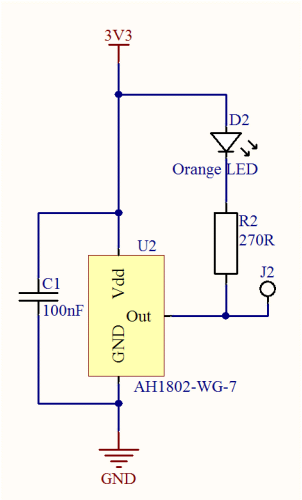
Device	Package Code	Packaging (Note 3)	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH337-PL-A	P	SIP3	NA	NA	NA	NA	4000/Box	-A
AH337-PL-B	P	SIP3	1000	-B	NA	NA	NA	NA
AH337-WL-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA
AH337-WG-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA

Table 2: AH337 Package and Reel options

AH1802 OMNIPOLAR - http://www.diodes.com/products/catalog/detail.php?item-id=1801

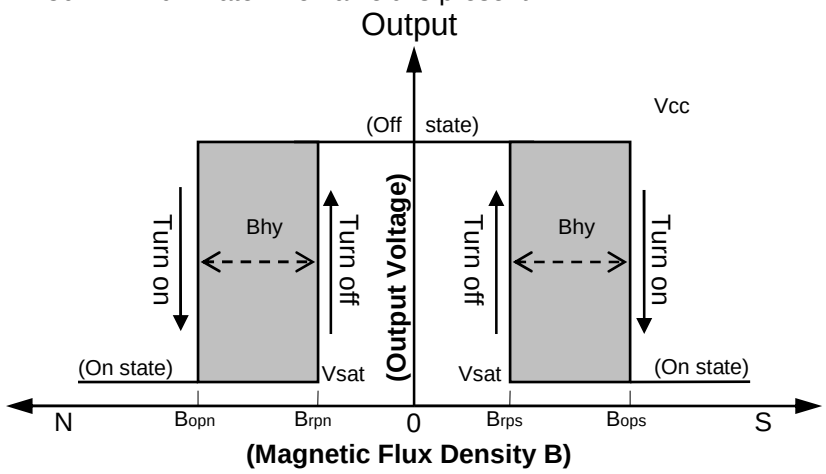
PCB Left Centre





Figures 6&7: AH1802 circuit

AH1802 is an Omnipolar device. The single output will be switched on (active low) when either a north or south pole is place over the device. The output does not latch. The orange LED adjacent to the AH1802 will illuminate when a field is present.



Parameter	Typical Value/range	Unit
Bops	28	Gauss
Brps	20	Gauss
Bopn	-28	Gauss
Brpn	-20	Gauss
Vdd	2.2 – 5.5	V

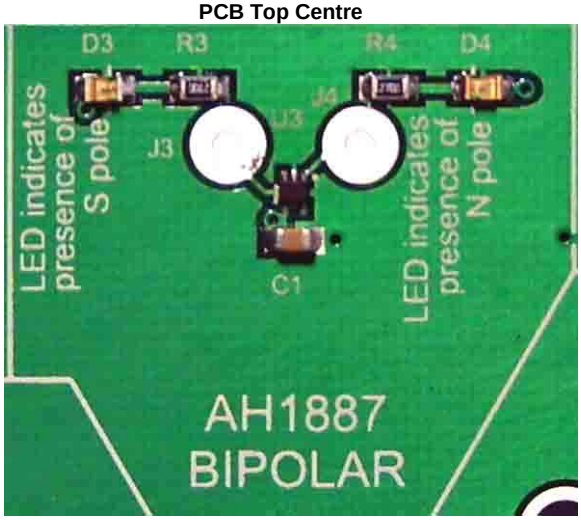
Figure 8 & Table 3: AH1802 Operating characteristics

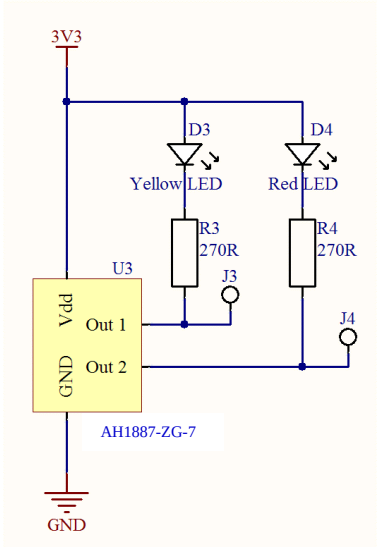
Device	Package Code	Packaging (Note 2)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1802-WG-7	W	SC59	3000/Tape & Reel	-7
AH1802-SNG-7	SN	DFN2020-6	3000/Tape & Reel	-7
AH1802-FJG-7	FJ	DFN2020-3	3000/Tape & Reel	-7
AH1802-FY4G-7	FY4	DFN2015H4-3	3000/Tape & Reel	-7

Table 4: AH1802 Package and Reel options

AH1887 BIPOLAR- http://www.diodes.com/products/catalog/detail.php?item-id=1808

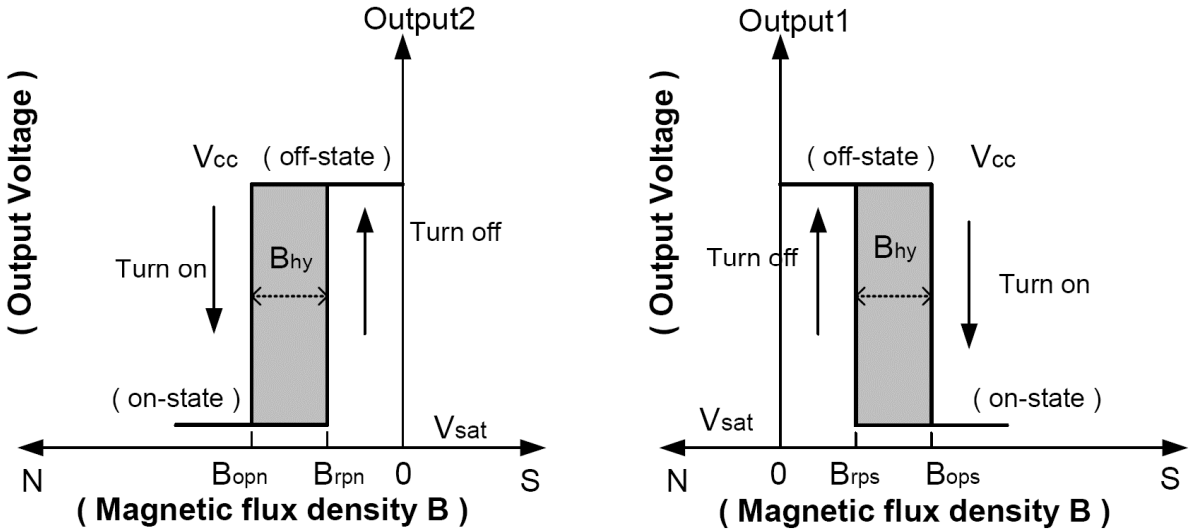
PCB Top Centre





Figures 9&10: AH1887 Circuit

AH1887 is best described as a Twin Unipolar device, although it could be considered Bipolar. Output 1 will be switched on (active low) when a S pole is placed over the device and will release when the field is removed. Output 2 will be switched on (active low) when a N pole is placed over the device and will release when the field is removed. Neither output latches. Output 1 will illuminate a yellow LED (south field) and output 2 will illuminate a red LED (north field).



Parameter	Typical Value/range	Unit
Bops	61	Gauss
Brps	53	Gauss
Bopn	-61	Gauss
Brpn	-53	Gauss
Vsat	0.2	V
Vdd	1.65 – 3.3	V

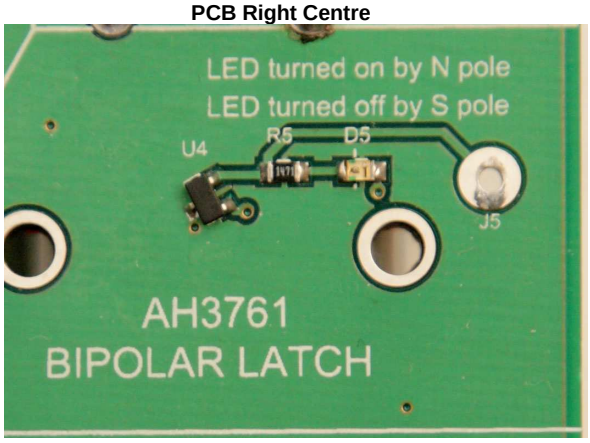
Figure 11 & Table 5: AH1887 Operating characteristics

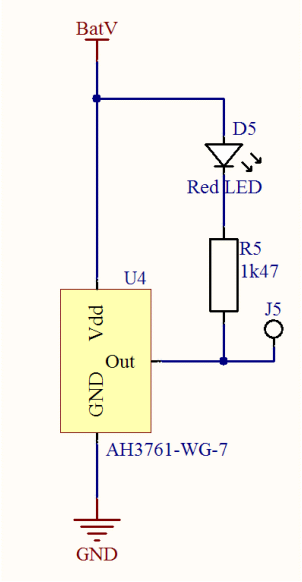
Device	Package Code	Packaging (Note 2)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1887-ZG-7	Z	SOT553	3000/Tape & Reel	-7

Table 6: AH1887 Package and Reel options

AH3761 BIPOLAR LATCH - http://www.diodes.com/products/catalog/detail.php?item-id=5486

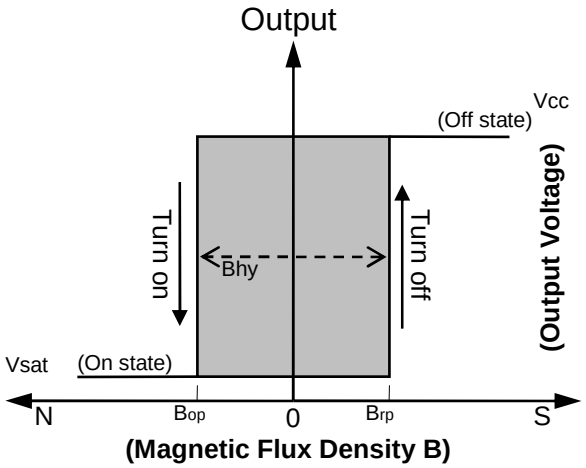
PCB Right Centre





Figures 12&13: AH3761 circuit

The AH3761 is a Bipolar latching device. The output is switched on by the presence of a north pole and switched off by the presence of a south (note package orientation in the datasheet. The characteristic diagram below is drawn to show the operation of the surface mount device when operated from above (ie marking side)).



Parameter	Typical Value/range	Unit
Bop	-30	Gauss
Brp	30	Gauss
Vsat	300	mV
Vdd	3 – 28	V

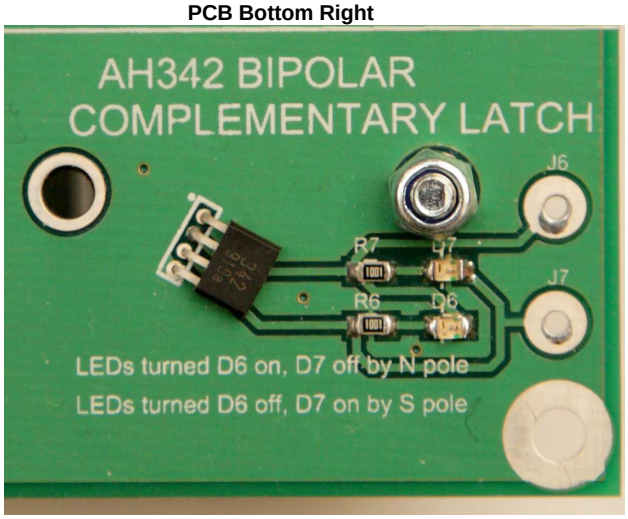
Figure 14 & Table 7: AH3761 Operating characteristics

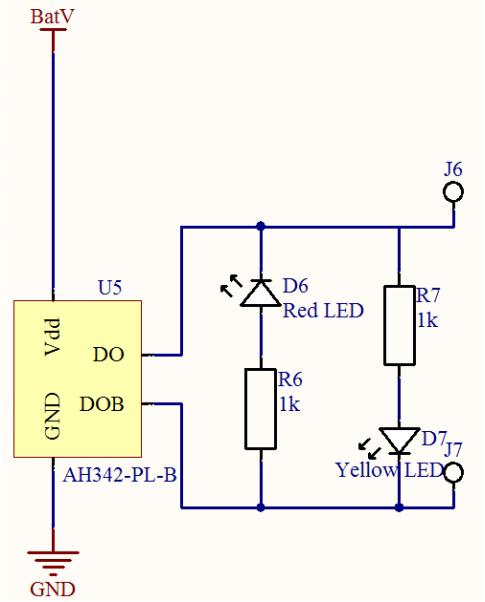
Device	Package Code	Packaging (Note 2)	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH3761-PG-A	P	SIP3	NA	NA	NA	NA	4000/Box	-A
AH3761-PG-B	P	SIP3	1000	-B	NA	NA	NA	NA
AH3761-WG-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA

Table 8: AH3761 Package and Reel options

AH342 BIPOLAR LATCH - http://www.diodes.com/products/catalog/detail.php?item-id=1814

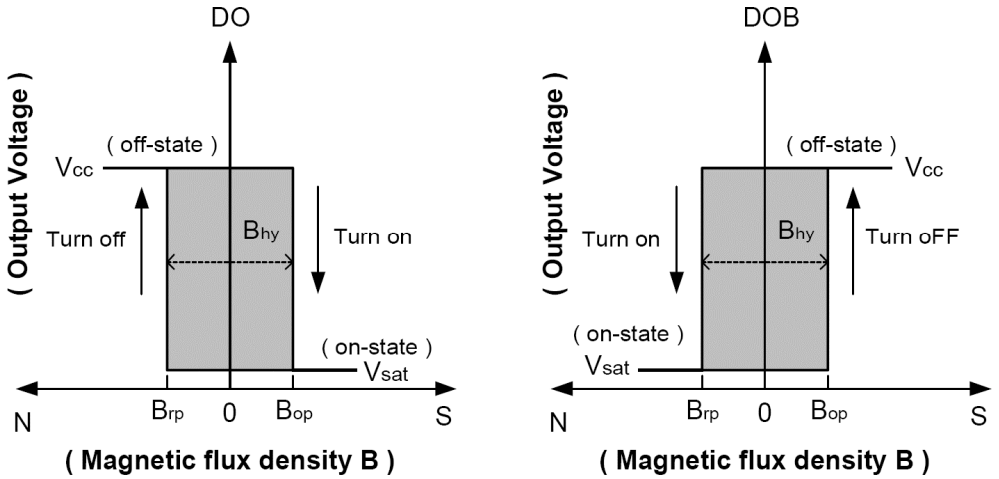
PCB Bottom Right





Figures 15 & 16: AH342 circuit

The AH342 is a Bipolar complementary latching device. The two outputs will be in opposite states, depending on the magnetic field detected. Additionally, the outputs will both sink and source current. If the outputs are connected across the load (as on this board) then the direction of current flow will indicate the polarity of the last detected magnetic field. The red LED (D6) will be lit when a north pole is detected and remain lit until a south pole is detected. The yellow LED (D7) is lit by a south pole being detected and turned off by a north pole.



Parameter	Typical Value/range	Unit
Bop	30 – 150	Gauss
Brp	-30 – -150	Gauss
Vsat	0.1	V
Vdd	4.5 – 28	V

Figure 17 & Table 9: AH342 Operating characteristics

Device	Package Code	Packaging (Note 2)	Bulk	
			Quantity	Part Number Suffix
AH342-PL-B	P	SIP-4L	1000	-B

Table 10: AH342 Package Option

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Sales offices

The Americas
3050 E. Hillcrest Drive
Westlake Village,
CA 91362-3154
Tel: (+1) 805 446 4800
Fax: (+1) 805 446 4850

Europe
Kustermannpark
Balanstraße 59,
D-81541 München
Germany
Tel: (+49) 894 549 490
Fax: (+49) 894 549 4949

Taiwan
7F, No. 50,
Min Chuan Road
Hsin-Tien
Taipei, Taiwan
Tel: (+886) 289 146 000
Fax: (+886) 289 146 639

Shanghai
Rm. 606, No.1158
Changning Road
Shanghai, China
Tel: (+86) 215 241 4882
Fax (+86) 215 241 4891

Shenzhen
Room A1103-04,
ANLIAN Plaza, #4018
Jintian Road
Futian CBD,
Shenzhen, China
Tel: (+86) 755 882 849 88
Fax: (+86) 755 882 849 99

Korea
6 Floor, Changhwa B/D,
1005-5 Yeongtong-dong,
Yeongtong-gu, Suwon-si,
Gyeonggi-do, Korea 443-813
Tel: (+82) 312 731 884
Fax: (+82) 312 731 885