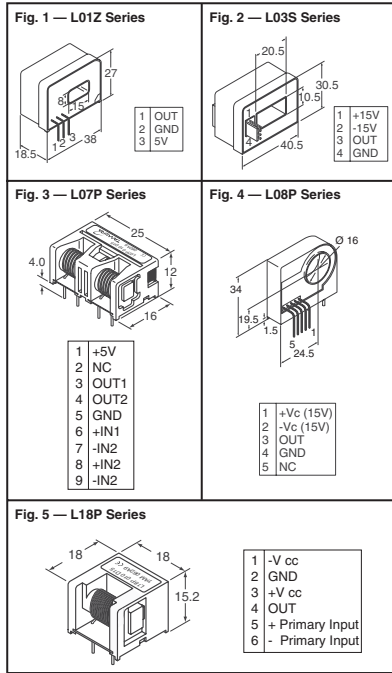




Open Loop Current Sensors Hall Effect Technology



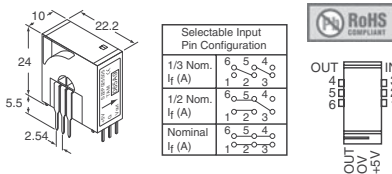
A hall effect current sensor measures the magnetic flux which is produced proportionally to the current without any contact with the primary circuit. This results in no voltage drop in the measured circuit which provide excellent galvanic isolation. **Features:** • Galvanic isolation between primary and measuring circuit, measures DC or AC (kHz) • Zero insertion loss • Quick response **Specifications** (measured at Input Voltage and @ 25°): • Frequency Band Width (-3dB): L01Z, L03S, L08P, L18P: DC-50kHz; L07P: DC-35kHz • Output Linearity: ±1% • Operating Temperature: -10°C - 80°C • Insulation Resistance @ 500VDC: ≥500MΩ - di/dt • Response Time: 5μs Sec. Typ. (10μ for L08P Series) • Load Resistor: 10kΩ 3mW minimum.

Fig.	Primary Nominal Current (A)	Supply Voltage (V)	Secondary Output Volt. (V)	Saturation Current (A)	Offset Temp. Coefficient (mV/°C)	Digi-Key Part No.	1	10	25	50	Tamura Part No.
L01Z Series											
1	±50	+5	4†	±62.5	≤±2	MT7173-ND◆	17.75	14.20	11.36	10.65	L01Z050S05
	±100	+5	4†	±125	≤±1	MT7174-ND◆	17.75	14.20	11.36	10.65	L01Z100S05
	±150	+5	4†	±187.5	≤±1	MT7175-ND◆	17.75	14.20	11.36	10.65	L01Z150S05
	±200	+5	4†	±250	≤±1	MT7176-ND◆	17.75	14.20	11.36	10.65	L01Z200S05
	±400	+5	4†	±500	≤±1	MT7178-ND◆	17.75	14.20	11.36	10.65	L01Z400S05
	±600	+5	4†	±750	≤±1	MT7180-ND◆	17.75	14.20	11.36	10.65	L01Z600S05
L03S Series (Molex Mating Connector Required)											
2	±50	±15	±4	±150	≤±2	MT7181-ND◆	17.48	13.98	11.19	10.49	L03S050D15
	±200	±15	±4	±600	≤±1	MT7183-ND◆	17.48	13.98	11.19	10.49	L03S200D15
	±400	±15	±4	±700	≤±1	MT7185-ND◆	17.48	13.98	11.19	10.49	L03S400D15
	±500	±15	±4	±700	≤±1	MT7186-ND◆	17.48	13.98	11.19	10.49	L03S500D15
L07P Series — RoHS Compliant											
3	±3	±15	±4	±9	≤±2	MT7297-ND	17.90	14.32	11.46	10.74	L07P003D15
	±5	±15	±4	±15	≤±2	MT7298-ND	17.90	14.32	11.46	10.74	L07P005D15
	±10	±15	±4	±30	≤±2	MT7299-ND	17.90	14.32	11.46	10.74	L07P010D15
	±15	±15	±4	±45	≤±2	MT7300-ND	17.90	14.32	11.46	10.74	L07P015D15
	±20	±15	±4	±60	≤±2	MT7301-ND	17.90	14.32	11.46	10.74	L07P020D15
	±25	±15	±4	±75	≤±2	MT7302-ND	17.90	14.32	11.46	10.74	L07P025D15
L08P Series											
4	±50	±15	±4	±150	≤±2	MT7188-ND◆	16.20	12.96	10.37	9.72	L08P050D15
	±100	±15	±4	±300	≤±1	MT7189-ND◆	16.20	12.96	10.37	9.72	L08P100D15
	±150	±15	±4	±350	≤±1	MT7190-ND◆	16.20	12.96	10.37	9.72	L08P150D15
L18P Series — RoHS Compliant											
5	±3	±15	±4	±9	≤±1.5	MT7311-ND	12.60	10.08	8.07	7.56	L18P003D15
	±5	±15	±4	±15	≤±1.5	MT7312-ND	12.60	10.08	8.07	7.56	L18P005D15
	±10	±15	±4	±30	≤±1.5	MT7313-ND	12.60	10.08	8.07	7.56	L18P010D15
	±15	±15	±4	±45	≤±1.5	MT7314-ND	12.60	10.08	8.07	7.56	L18P015D15
	±20	±15	±4	±60	≤±1.5	MT7315-ND	12.60	10.08	8.07	7.56	L18P020D15
	±25	±15	±4	±60	≤±1.5	MT7316-ND	12.60	10.08	8.07	7.56	L18P025D15
	±30	±15	±4	±90	≤±1.5	MT7317-ND	12.60	10.08	8.07	7.56	L18P030D15

† + Vref = 2.5V at 0 Amps ◆ RoHS Compliant

WM2022-ND	Waldom Molex, 4 Position Housing (2.50mm) KK Series	\$59
WM2312-ND	Waldom Molex, Crimp Terminal - Wire Size: 22-30AWG; Insulation Dia.: .062" (1.57) Max; Finish: Selective Gold 15u"	\$2.68/10
WM1129-ND	Waldom Molex, Crimp Terminal - Wire Size: 22-30AWG; Insulation Dia.: .062" (1.57) Max; Finish: Gold 15u"	\$8.66/10
WM1114-ND	Waldom Molex, Crimp Terminal - Wire Size: 22-30AWG; Insulation Dia.: .062" (1.57) Max; Finish: Tin	\$1.24/10
WM9999-ND	Waldom Molex, Universal Crimp Tool	\$50.75
WM9927-ND	Waldom Molex, Extraction Tool	\$6.77

Closed Loop Multi-range Current Sensors



Closed loop (compensated) current sensor provides an exact duplication of the primary current scaled by the number of turns in the secondary coil. Each multi-range sensor has a nominal sensing current but can be changed by configuring the primary pins. The sensing current can be scaled down by 1/2 or 1/3 the nominal output sensing current, which gives you the flexibility to sense 3 different current ranges with only one part.

Specifications (measured at input voltage and 25°C): • Frequency Bandwidth S22P(1dB): DC-200kHz (at higher frequencies derating is required to prevent core from overheating) • Output Linearity: ±0.25% • Operating Temperature: -10°C - 85°C • Insulation Resistance @ 500VDC: ≥ 500MΩ • Response Time: 1μSec. • Load Resistor 10kΩ 3mW Minimum

Primary Nominal Current (A)	Supply Voltage (V)	Secondary Output Volt. (V)±1%	Saturation Current (A)	Offset Temp. Coefficient (mV/°C)	Digi-Key Part No.	1	10	25	50	Tamura Part No.	
S22P Series											
±6	+5	2.5±30mV	±18	1.25	MT7318-ND	15.18	12.14	9.72	9.11	S22P006S05	
±15	+5	2.5±20mV	±45	1.25	MT7319-ND	15.18	12.14	9.72	9.11	S22P015S05	
±25	+5	2.5±15mV	±75	1.25	MT7320-ND	15.18	12.14	9.72	9.11	S22P025S05	



Current Transformer Standard Accuracy Low-Cost 50/60 Hz

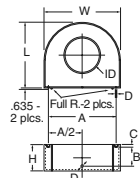
Applications:

- Sensing current overload
- Ground fault detection
- Metering

Notes:

• RCF: Ratio Correction Factor. Multiply current readings by this factor to compensate for transformer losses. • Data is deemed reliable at the time of publication, but may be subject to change without notice.

Size Code	Dimensions - mm							
	W	L	H	A	B	C	D (Dia.)	ID
A	23.83	23.83	11.13	15.24	7.62	1.75	0.81	9.53
B	30.18	30.18	14.30	20.32	10.16	2.08	1.02	11.43
C	34.93	34.93	14.30	25.40	10.16	2.08	1.02	14.61
D	38.10	38.10	15.88	30.48	10.16	2.84	1.02	14.61
E	44.45	44.45	14.30	35.56	10.16	2.08	1.02	19.05
F	55.58	55.58	20.65	45.72	12.70	3.96	1.02	23.88



Size Code	Rated Ip Amps	Turns Ratio	Nominal DCR	RCF @ 10% (1)	Volts/Amp @ Rated Ip, for Various Loads (Ω)				Digi-Key Part No.	Price Each			Amveco Part No.
					100	500	2K	5K		1	10	25	
A	5.0	1000:1	39	1.040	0.10	0.45	1.35	1.8	TE1005-ND◆	9.21	7.68	6.14	AC-1005
A	10.0	1000:1	39	1.035	0.10	0.45	1.00	1.3	TE1010-ND◆	9.21	7.68	6.14	AC-1010
A	15.0	1000:1	39	1.030	0.10	0.43	0.80	1.0	TE1015-ND◆	9.21	7.68	6.14	AC-1015
A	20.0	1000:1	39	1.030	0.10	0.42	0.70	0.8	TE1020-ND◆	7.53	6.28	5.02	AC-1020
B	25.0	1000:1	46	1.020	0.10	0.40	1.00	1.2	TE1025-ND◆	11.01	9.18	7.34	AC-1025
B	30.0	1000:1	46	1.020	0.10	0.40	0.85	1.1	TE1030-ND◆	11.04	9.20	7.36	AC-1030
C	40.0	1000:1	46	1.020	0.10	0.45	0.75	1.0	TE1040-ND◆	12.78	10.65	8.52	AC-1040
C	50.0	1000:1	46	1.020	0.10	0.44	0.70	0.8	TE1050-ND◆	13.89	11.58	9.26	AC-1050
D	60.0	1000:1	23	1.020	0.10	0.36	0.60	0.7	TE1060-ND◆	14.49	12.08	9.66	AC-1060
D	75.0	1000:1	23	1.015	0.10	0.35	0.50	0.6	TE1075-ND◆	14.55	12.13	9.70	AC-1075
E	100	1000:1	20	1.015	0.10	0.35	0.50	0.6	TE1100-ND◆	14.97	12.48	9.98	AC-1100
F	150	1000:1	10	1.010	0.10	0.32	0.55	0.6	TE1150-ND◆	19.83	16.53	13.22	AC-1150
F	200	1000:1	10	1.010	0.10	0.30	0.45	0.6	TE1200-ND◆	20.10	16.75	13.40	AC-1200

◆ RoHS Compliant

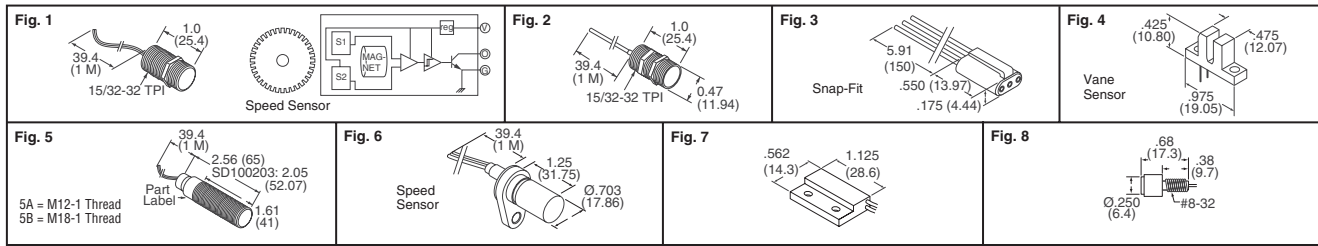
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CHERRY Solid State Magnetic Hall Effect Sensors



Cherry magnetic sensors are used to detect changes in magnetic field polarities and the motion of ferrous metals such as gear tooth movements. Used for such applications as speed and proximity sensing, magnetic polarity detection and current flow monitoring. Solid state design for unlimited life.

Features:

MP100 Series:

- Aluminum threaded barrel sensor for speed and position sensing
- The threaded barrel allows precise positioning and adjustment

GS100 Series:

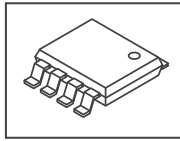
- Barrel sensors intended for gear tooth speed sensing
- High speed capability, ideal for timing power gears, conveyor speed and other rotating gear
- Built-in magnet supplies its own bias field
- GS101202 is plastic housing with steel bushing

Fig.	Supply Voltage	Output Current	Terminal Type	Polarity	Digi-Key Part No.	1	10	50	100	Cherry Part No.
1	4.5-24VDC	25mA	20AWG Wires	Gear Teeth	CH398-ND†	31.16	27.70	23.08	21.35	GS100701
2	4.75-24VDC	25mA	20AWG Wires	South Pole	CH396-ND†	25.19	22.40	18.66	17.27	MP100701
3	4.75-24VDC	25mA	24AWG Wires	South Pole	CH399-ND	6.26	5.57	4.64	4.30	MP101301
4	4.5-24VDC	25mA	PC Mount 24AWG Wires	Ferrous Vane	CH401-ND◆ CH712-ND◆	6.89 7.53	6.12 6.70	5.10 5.58	4.72 5.17	VN101501 VN101503
5A	4.5-24VDC	25mA	20AWG Wires 22AWG Wires	Gear Teeth	CH416-ND† CH414-ND*	31.16 55.62	27.70 49.44	23.08 41.20	21.35 38.11	GS100502 GS100102
5A	4.75-24VDC	25mA	20AWG Wires	South Pole	CH708-ND†	25.19	22.40	18.66	17.27	MP100502
	4.5-24VDC	25mA	12mm Conn.		CH705-ND*	60.64	53.91	44.92	41.56	GS100201
	4.5-24VDC	25mA	22AWG Wires	Gear Teeth	CH415-ND*	57.24	50.88	42.40	39.22	GS100202
	5-24VDC	—	20AWG Wires		CH706-ND*	52.92	47.04	39.20	36.26	GS100203
6	5-24VDC	25mA	20AWG Wires	Gear Teeth	CH417-ND	33.26	29.57	24.64	22.80	GS101202
7	4.5-24VDC	25mA	24AWG Wires	North Pole	CH400-ND◆	7.40	6.58	5.48	5.07	MP102103
8			Threaded Actuator, South pole magnet, Aluminum Housed		CH700-ND◆	5.29	4.71	3.92	3.63	AS101001

† Industrial Grade-Stainless Steel † Commercial Grade Aluminum ◆ RoHS Compliant

Honeywell Sensors

Linear / Angular / Rotary Displacement Sensors – HMC1501 / HMC1512



High resolution, low power MR sensor capable of measuring the angle direction of a magnetic field from a magnet with <0.07° resolution. Output is typical Wheatstone Bridge

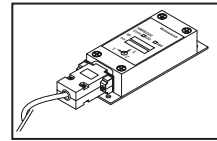
- No "rare earth" magnets; functions with Alnico or ceramic type magnets
- Linear range of 8mm with two sensors mounted on two ends; range may be increased through multiple sensor arrays operating together
- Absolute sensing ability to know exact position and require no indexing for proper positional output
- No moving parts to wear out
- 8-pin SMT package
- Case dimensions (exclusive of pins) of 5mm x 4mm x 1.2mm total mounting envelope, with pins of less than 6mm square
- Full scale output range of 120mV with 5V of power supply.

- Applications: Linear Displacement • Angular Displacement • Motor Control • Valve Position • Proximity Detection • Current Spike Detection
- Specifications (at 25°C except stated otherwise):
- Typical Bridge Supply: 5V, Vbridge referenced to GND
- Sensitivity Vbridge = 5V, field 80 Oe: 2.1mV/° @ zerocrossing; 1.8mV/° @ zero crossing, averaged in the range of 45°
- Typical Peak-to-Peak Voltage: 120mV, Vbridge=5V, field=80 Oe
- Bandwidth: 0MHz - 5MHz, Magnetic signal
- Typical Hysteresis Error: 30µV°, 1.7x10⁻⁶ mV°, Magnetic field saturation field, Vbridge = 5V

Typ. Bridge Resistance @ 1mA	Angle Range ± Saturation Field	Typ. Resolution 10Hz Bandwidth Vbridge=5V <0.07°	Digi-Key Part No.	Price Each	Honeywell Part No.
5KΩ	±45°	<0.07°	342-1008-5-ND	17.00	HMC1501
2.1KΩ	±90°	<0.05°	342-1010-1-ND	17.00	HMC1512
2.1KΩ	±90°	<0.05°	342-1010-2-ND†	1625.00/1,000	HMC1512

† Tape and Reel

Smart Digital Magnetometer – HMR2300

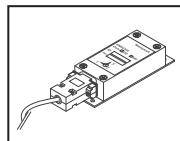


Microcontroller-Based Smart Sensor with range of ±2 Gauss; <70µGauss Resolution. Has high accuracy over ±1 Gauss; <0.5%FS; and Output Rate Selectable of 10 to 154 Samples/Sec. This sensor has a three-axis digital output, BCD ASCII or Binary, RS-232 Serial Output (9600 or 19200), and a 9-pin D-Sub connector.

- Applications: Compassing – Avionics and Marine • Remote Vehicle Monitoring (Roll/Pitch/Yaw) • Process Control • Laboratory Instrumentation • Anomaly Detection • Traffic and Vehicle Detection • Security Systems
- Specifications: • Supply Voltage: 6.5V – 15V; Pin 9 referenced to Pin 5
- Typical Supply Current: 27mA; Vsupply=15V, with S/R=ON
- Operating Temp: -40°C - 85°C; Ambient
- Field Range: ±2 gauss; Full scale (FS) - total applied field
- Typical Linearity Error: 1%FS; Best fit straight line at 25°C ±2 Gauss
- Typical Hysteresis Error: 0.01%FS; 3 sweeps across ±2 Gauss @ 25°C
- Minimum Resolution: 67µgauss; Applied field to change output. (Units: 1 gauss (G) = 1 Oersted (in air), 1G=79.58A/m, 1G=10E-4 Tesla, 1G=10E5 gamma)

Serial Output	Description	Digi-Key Part No.	Price Each	Honeywell Part No.
RS-232	Flush Mount Enclosure, Aluminum, 3.25" x 1.50" x 1.13" (82.55 x 38.1 x 28.70mm)	342-1015-ND	744.30	HMR2300-D20-232
RS-232	Extended Enclosure, Aluminum, 4.00" x 1.50" x 1.13" (101.60 x 38.1 x 28.70mm)	342-1016-ND	744.30	HMR2300-D21-232
RS-485	Without Enclosure	342-1017-ND	700.00	HMR2300-D00-485
RS-485	Flush Mount Enclosure, Aluminum, 3.25" x 1.50" x 1.13" (82.55 x 38.1 x 28.70mm)	342-1018-ND	744.30	HMR2300-D20-485
RS-485	Extended Enclosure, Aluminum, 4.00" x 1.50" x 1.13" (101.60 x 38.1 x 28.70mm)	342-1019-ND	744.30	HMR2300-D21-485
RS-232	HMR2300 Development Kit with RS-232 Output, Cables, Manual	342-1012-ND	795.00	HMR2300-Demo-232

Digital Compass Module – HMR3000



Electronic compass module that provides heading, pitch and roll output for navigation and guidance systems. This solid state magnetoresistive sensors make this strapdown compass both rugged and reliable. This compass provides fast response time up to 20Hz and high heading accuracy of 0.5° with 0.1° resolution.

- Built with solid state magnetic sensors and no moving parts improves response time, allowing faster updates compared to gimbaled fluxgates
- Available as a circuit board 1.2" x 2.95", weighing less than one ounce, or in an aluminum enclosure
- Operates with less than 35mA, allowing for long operation with a battery
- Accuracy better than 0.5° with 0.1° resolution for critical positioning applications
- Tilt range of ±40° for both the roll and pitch allows operation for most applications
- Calibration routines to compensate for distortion due to nearby ferrous objects and stray fields, such as vehicles
- User settings of baud rate, update rate, output format, units, filter settings, deviation angles, alarms, and warnings are stored internally in non-volatile memory.

- Specifications: • Typical Supply Voltage: 5.0VDC regulated, 6-15VDC unregulated
- Typical Power: 35mA @ 6VDC Normal Operation, 13mA STOP Mode, 2.0mA SLEEP Mode
- Serial: RS-232 / RS-485 (Half Duplex) • Baud Rate: 1200 - 38400 bps

Serial Output	Description	Digi-Key Part No.	Price Each	Honeywell Part No.
RS-232	Without Enclosure	342-1024-ND	650.00	HMR3000-D00-232
RS-232	Enclosure, Extended Base	342-1025-ND	675.00	HMR3000-D21-232
RS-485	Without Enclosure	342-1026-ND	650.00	HMR3000-D00-485
RS-485	Enclosure, Extended Base	342-1027-ND	675.00	HMR3000-D21-485
	HMR 3000 Development Kit, with RS-232 Output, Cables, Manual	342-1022-ND	795.00	HMR3000-Demo-232

Digital Compass Module – HMR3200/3300

Electronic compassing solutions that provide heading information for use in navigation and guidance systems. Magnetoresistive sensors are utilized to provide the reliability and accuracy of these small, solid state compass designs. These compass solutions are easily integrated into systems using a UART interface in ASCII format.

- Features: Accuracy: 1° heading accuracy, 0.1° resolution and 0.5° repeatability
- Tilt Range: The HMR3300 may be operated up to a ±60° tilt range for both pitch and roll. Accuracy and performance are enhanced over a wider range of operating conditions and applications with this feature.
- The HMR3200 is not tilt compensated. Performance is optimized in horizontal or vertical orientations.
- Low Power: Typical operating current is 18mA for the HMR3200
- Response Time: The HMR3200 has 15Hz response time for faster updates compared to gimbaled, mechanical fluxgate compasses.

- Specifications: • Magnetic Field: Range: ±2 gauss typical, Resolution: 0.1 mGauss
- Electrical: Input Voltage: Unregulated: 6VDC - 15VDC, Regulated: 5.0Vdc
- Interface: UART - User selectable baud rate 2400 - 19200 baud
- Physical: Dimensions - Conditions: Circuit board, 1.0" x 1.45" x 0.4" (25.4 x 36.8 x 11 mm)

Header Pin Assignment	
Pin No.	Pin Name
1	SCK
2	RX/SDI
3	TX/SDO
4	CS
5	CAL
6	5V
7	GND
8	+V

Serial Output	Description	Digi-Key Part No.	Price Each	Honeywell Part No.
UART	Digital Compass Module 2-axis	342-1030-ND	300.00	HMR3200
UART	Digital Compass Module 3-axis	342-1032-ND	385.00	HMR3300
	HMR 3200 Development Kit, with RS232 Output, Cables, Manual	342-1031-ND	365.00	HMR3200-Demo-232
	HRMR 3300 Digital Compass Module with RS232 Motherboard	342-1039-ND	450.00	HMR3300-D00-232
	HMR 3300 Development Kit, with RS232 Output, Cables, Manual	342-1033-ND	450.00	HMR3300-Demo-232

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