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HCM4100S
Technical Data Sheet



HCM4100S Hybrid Sensor



- 2 Axis inclinometer
- 20 configurable I/O's
- 1 CANbus
- Programmable via Guitu
- Intelligent CANopen profile
- Designed for operation at both 12V and 24V

HCM4100S Hybrid Sensor features combines dual accelerometer and programmable controller with 20 configurable I/O lines. Sensor is targeted for tough environmental conditions for applications where high stability is demanded.

Advanced sensor design minimises disturbances from mechanical shocks and vibration.

HCM4100S can be used as standalone solution or as a part of CAN based control system.

Technical Information

- 9-32V operating voltage range
(Protected against reverse polarity)
- Less than 100mA current consumption at no load
- $\pm 90^\circ$ inclinometer measuring range (X & Y)
0.1° accuracy ($\pm 45^\circ$)
0.5° accuracy ($-85^\circ \dots -45^\circ$ and $45^\circ \dots 85^\circ$)
- $-40 \dots +85^\circ\text{C}$ operating temperature range
- 32-bit microprocessor
- IP67 aluminium housing
- Weight 0.6kg
- Main dimensions 112mm x 102mm x 34mm
- One 26 pin AMP Super Seal connector
- CAN Interface 2.0B, ISO 11898



I/O Interface

- Total of 20 configurable IO-lines
- The I/O interface is protected against short to GND and to supply voltage
- Configurable reference voltage: 5V / 10V, max 250mA

| Amount | Configurability | Details |
|--------|--|---|
| 2 | Digital input | Low<3.5V, High>5V, max 100Hz |
| 6 | Digital input Analog input | Low<3.5V, High>5V, max 100Hz 12-bit AD conv., 0-10.4V/0-22mA |
| 8 | Digital input Digital output Current controlled PWM output | Low<3.5V, High>5V, max 100Hz High side switch, max. 3A High side switch, max. 3A |
| 4 | Digital input Frequency/pulse input Digital output PWM output | Low<3.5V, High>5V, max 100Hz Low<3.5V, High>5V, max 8kHz High side switch, max. 3A High side switch, max. 3A |

Inclinometer

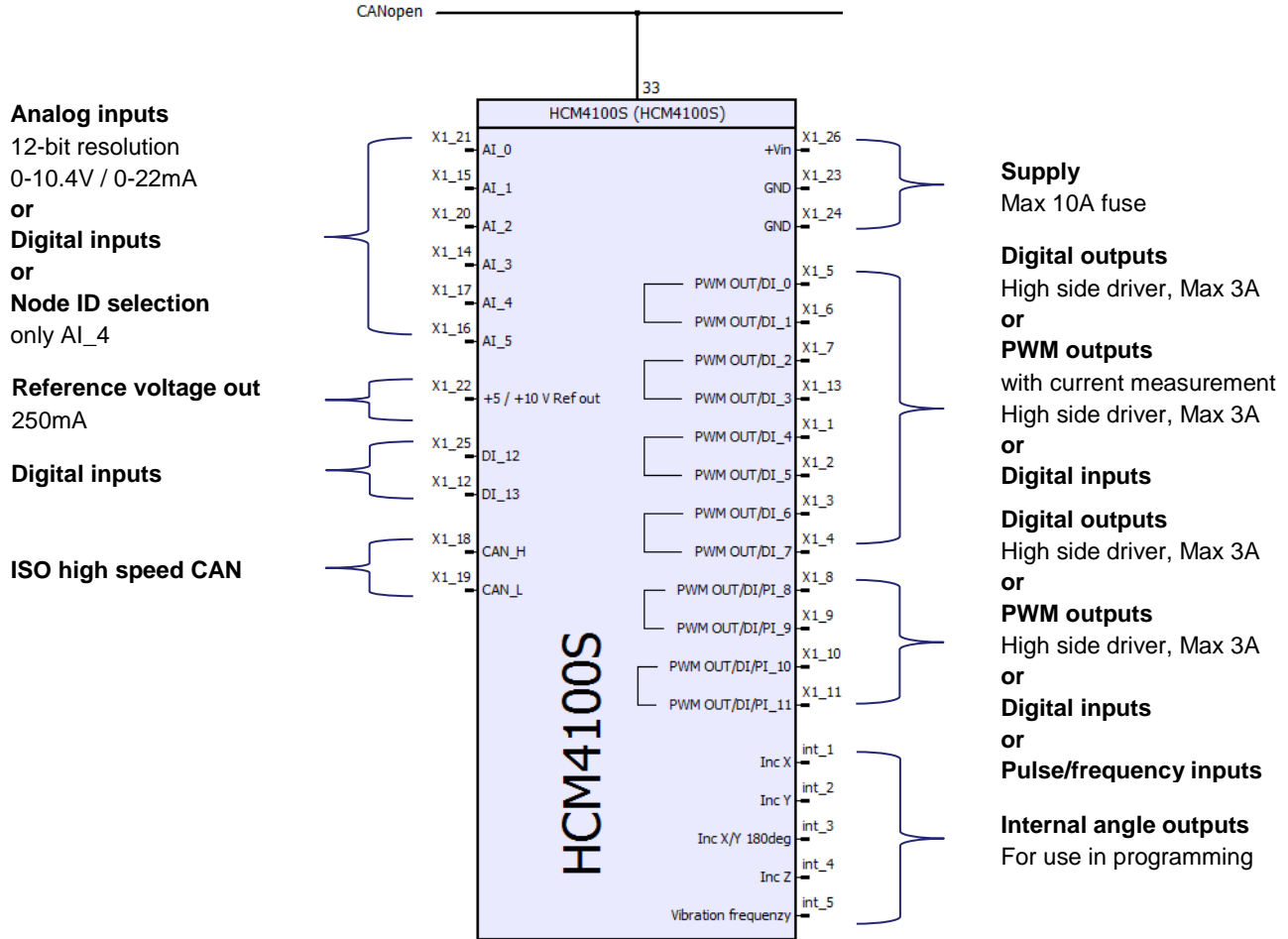
The product has built-in inclinometer. The data from it is brought to CAN bus as default:

| TPDO5 | Description | Details |
|--------|---------------|--|
| Byte 0 | X angle | -900 ... +900 [equals -90.0° ... +90.0°] |
| Byte 2 | Y angle | -900 ... +900 [equals -90.0° ... +90.0°] |
| Byte 4 | X angle speed | 10=1.0 °/s, accuracy 0.2 |
| Byte 6 | X angle speed | 10=1.0 °/s, accuracy 0.2 |

| TPDO6 | Description | Details |
|--------|-------------------------|--|
| Byte 0 | X angle acceleration | 10=1.0 °/s ² , accuracy 0.4 |
| Byte 2 | Y angle in acceleration | 10=1.0 °/s ² , accuracy 0.4 |
| Byte 4 | X/Y full rotation | -1800 ... +1800 [equals -180.0° ... +180.0°] |
| Byte 6 | Vibration frequency | 1=1Hz *) |

*) The measurement axis can be selected over object 2027h

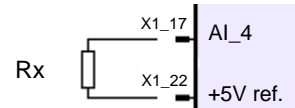
Wiring Diagram:



Node ID

As default the unit Node address is set by voltage level at AI_4.

| Voltage at AI_4 | Node ID offset | Rx / Ω |
|-----------------|----------------|---------------|
| 0V | 1 | open |
| 1.7V | 3 | 150k |
| 3.5V | 5 | 33k |
| 5.2V | 7 | 0 |
| 6.9V | 9 | n/a |
| 8.7V | 11 | n/a |
| 10.4V | 13 | n/a |



Node ID = Base Node ID (32) + Node ID offset

See also product's CANopen profile for further details.

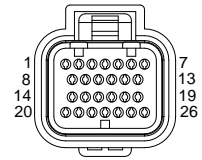
Connector

Tyco Electronics Super Seal Connector

Needed connector components:

| | |
|--|--|
| Super Seal Connector Plug Housing | AMP 3-1437290-7 |
| Receptacle Contact (0.75 – 1.25mm ²) | AMP 1447221-3 |
| Filler Plug ¹⁾ | AMP 4-1437284-3 Deutsch 0413-204-2005 |

¹⁾ Filler plugs must be used to reach waterproofness

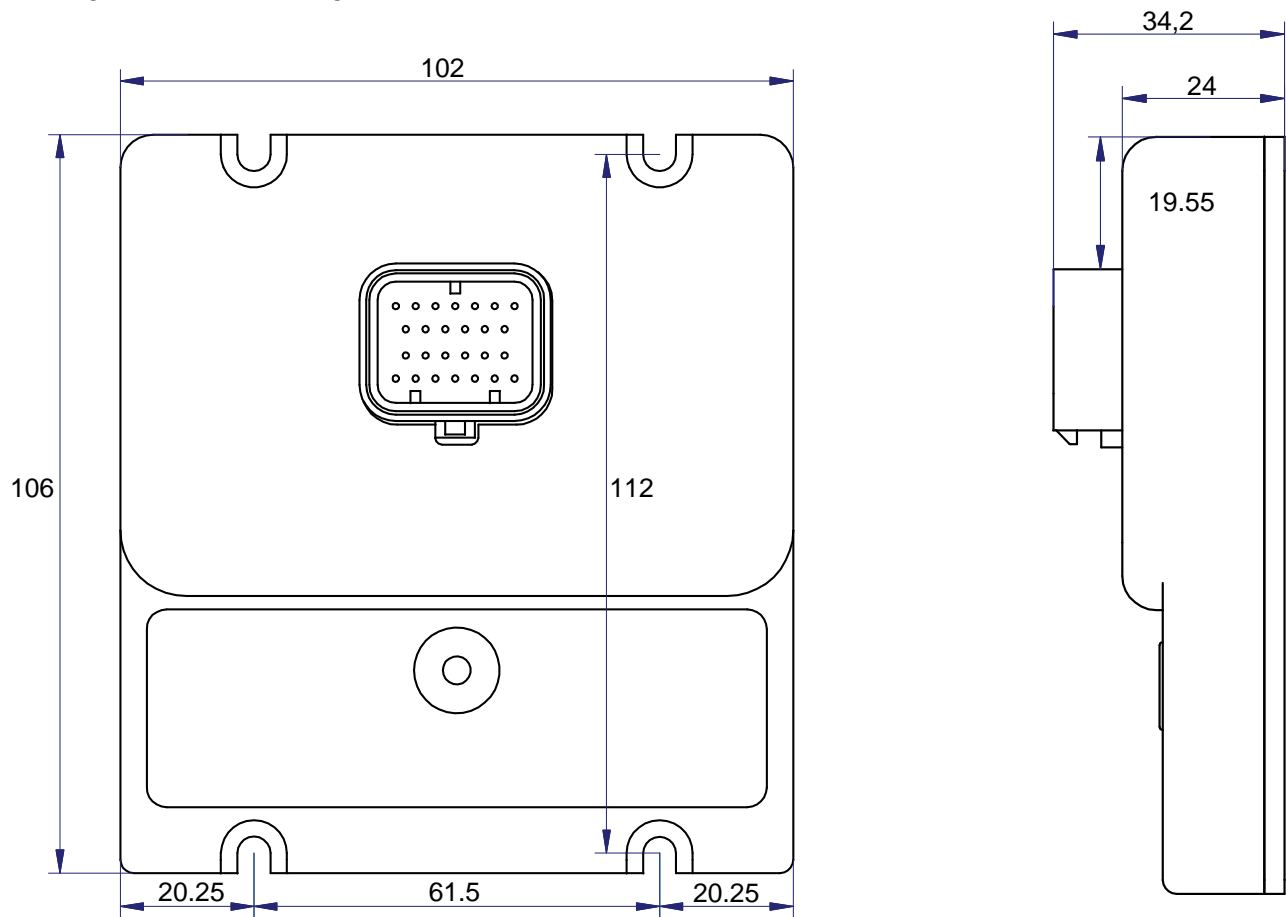


Tests & CE compliance – tests still pending

| | |
|---------------|---|
| EMC | <p>EN 61000-4-2, Testing and measurement techniques – Electrostatic discharge immunity test E/ECE Regulation No. 10, Revision 4 (2012), Emission and immunity tests</p> <p>IEC 60255-22-1, Electrical disturbance tests for measuring relays and protection equipment – 1 MHz burst immunity test</p> |
| Environmental | <p>EN 60068-2-1, Cooling test</p> <p>IEC 60068-2-2, Dry heat test</p> <p>IEC 60068-2-30, Damp heat test</p> <p>EN 60068-2-6, Stationary vibration</p> <p>EN 60068-2-27, Mechanical shock test</p> <p>IEC 60529, IP6X dust test</p> <p>IEC 60529, IPX7 temporary inversion test to 1m</p> <p>ISO 9227, Salt spray test</p> |

Mounting and Housing Dimensions

HCM4100S is fixed to flat surface with four M5 screws. The recommended mounting position is AMP connector facing down or to the side. In latter case it is recommended to leave some loose cable hanging in downward arc to prevent any moisture from accessing the module through the connector.



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