Honeywell

THE POWER OF **CONNECTED**

Transportation Attitude Reference Sensor (TARS Series)

Ruggedized Inertial Measurement Unit (IMU)

000828

Issue 1

Datasheet

DESCRIPTION

The Transportation Attitude Reference Sensor or TARS-IMU is a packaged sensor array designed to report vehicle angular rate, acceleration, and inclination for demanding applications in industries such as heavy duty, off-highway transportation.

TARS-IMU enables autonomous vehicle characteristics and enhances efficiency and productivity by reporting key data required to automate and monitor movements of vehicle systems and components. The sensor fusion algorithm can be customized for specific vehicle applications through on-board firmware, allowing movement data to be filtered for extraneous environment and vehicle movements.

With two sensor models for different power levels, TARS-IMU accommodates both 5 V and 9 V to 36 V vehicle power systems. While communication is carried to the vehicle through industry standard CAN J1939 connectivity.

As a standard, TARS-IMU is calibrated on aerospace-grade rate tables at the factory to provide calibration consistency between units.

DIFFERENTIATION

- **Flexible.** On-board firmware can tailor TARS-IMU to the specific vehicle and the specific application
- **Durable.** With top-of-the-line sealing (IP67, IP69K) TARS-IMU is ruggedized to withstand harsh or heavy-duty applications
- **Convenient.** TARS-IMU can be pre-configured at the Honeywell factory for immediate installation out of the box, or it can be delivered with customizable firmware that allows manufacturers to use a single part number across vehicles and applications

FEATURES

- High performance IMU, reports vehicle angular rate, acceleration and inclination (6 degrees of freedom)
- Ruggedized PBT thermoplastic housing design for the most demanding applications and environments (IP67 & IP69K certified)
- Advanced filtering of raw sensor data to minimize unwanted noise and vibrations, improves positioning accuracy
- Optional metal guard for added protection
- Supports 5 V and 9 V to 36 V vehicle power systems
- Operating temperature of -40 °C to 85 °C [-40 °F to 185 °F]
- Reduced power consumption
- Small form-factor

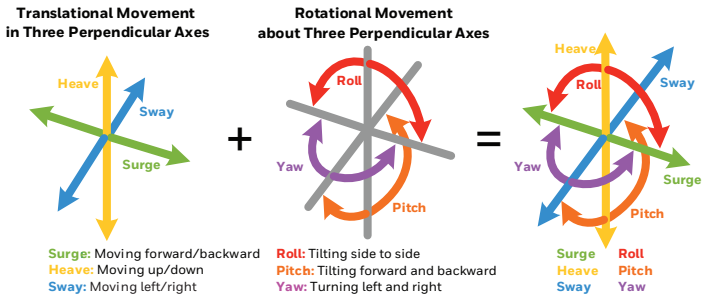
POTENTIAL APPLICATIONS

- Equipment control
- Linkage tracking
- Work monitoring
- Operator assisted control
- Performance and output control
- Linear position
- Bucket control
- Vehicle stability control

VALUE TO CUSTOMERS

- Designed to allow vehicle manufacturers and end users to increase efficiency with the automation of repetitive movements or complex tasks
- Enables precise movement, actuation and guidance over severe terrains and vehicle grades
- Enhances safety through enablement of monitoring and guidance capabilities that improve productivity of operators

SIX DEGREES OF FREEDOM



PORTFOLIO

TARS-IMU joins Honeywell's venerated sensor portfolio, and adds to the ever-increasing connected and intelligence driven capabilities that Honeywell offers. TARS-IMU is built to survive the demanding applications in industries like off-highway transportation and beyond.

Table 1. Sensor Specifications

Characteristic	Min.	Typ.	Max.	Unit
Gyroscope 3 axis performance				
Angular rate range	-245	–	+245	deg/sec
Angular rate resolution	–	7.8125	–	mdps
In-run bias stability	–	1	–	mdps
Rate noise density	–	0.004	–	deg/sec/sqrt/Hz
Offset (0 °C to 50 °C)	-0.8	–	+0.8	deg/sec
Offset (-40 °C to 85 °C)	-1.6	–	+1.6	deg/sec
Accelerometer 3 axis performance				
Acceleration range	-78.48	–	+78.48	m/s^2
Acceleration resolution	–	0.01	–	m/s^2
In-run bias stability	–	50	–	µg
Acceleration noise density	–	65	–	µg/sqrt Hz
Offset (0 °C to 50 °C)	–	±0.05	–	m/s^2
Offset (-40 °C to 85 °C)	–	±0.15	–	m/s^2
Inclination (pitch and roll) performance				
Range (2 axis x & y)	-85	–	+85	deg
Resolution	–	0.058	–	deg
Static inclination error (0 °C to 50 °C)	–	±0.3	–	deg
Static inclination error (-40 °C to 85 °C)	–	±0.9	–	deg
Translational acceleration error	–	±0.5	–	deg
Centripetal acceleration error	–	±0.5	–	deg
Settling time	–	–	2000	mSec

Table 2. Electrical Characteristics • TARS-LCASS Catalog LIsting

Characteristic	Min.	Nominal	Max.	Unit
Supply voltage	4.5	5	5.5	V
Supply current	–	–	100	mA
Start-up time	500	–	2000	mSec
Short circuit protection	CAN output shorted to power line and ground			
Open circuit protection	Single-line interruption and multiple-line interruption			
Reset response	Automatic after voltage drop			
CAN output characteristics per SAE J1939				
CAN Bus data rate	–	250	–	kBaud
Signal update rate	–	–	100	Hz