

# CFA-1301C

Compact, Rugged & Cost Effective  
Fiber Optic Heading Reference



ACCURACY AT WORK  
FOR CIVIL ENGINEERING  
& GEO REFERENCE APPLICATIONS



# ACCURACY AT WORK

## FOR CIVIL ENGINEERING & GEO REFERENCE APPLICATIONS



The **CFA-1301C** 3-axis FOG (fiber optic gyro) attitude and heading reference system has been designed to provide a cost effective, accurate geo-reference in harsh conditions without the need for an external GPS signal. The small size / volume makes it ideal for manual positioning in difficult physical locations.

Operation is based on inertial principles of initial gravity levelling using built-in accelerometers followed by geodetic heading calculation using the 3-axis gyroscopes. This alignment process requires 5 to 12 minutes dependent on latitude.

After inertial alignment the **CFA-1301C** gives continuous outputs of Heading, Roll and Pitch to enable subsequent movement of the target equipment to the required physical position.

Data read-out is achieved using a standard WiFi enabled device (such as smartphone, laptop) or using a custom PDA. In any case, the JSON interface protocol can be hardware platform independent (eg iOS, Android, Win10) to suit the final application. A serial RS422 interface is also available.

Rugged environmental conditions were an important feature in the design of this unit internally with the high integration of electronics and sensors modelled using 3D CAD. This played a key role in keeping the unit shock & vibration resistant.

## APPLICATION EXAMPLES:

- MINING RIG ALIGNMENT
- O&G REFERENCE SYSTEM
- HDD RIG ALIGNMENT
- MINING AUTOMATION

CHARACTERISTICS	CFA-1301C
Heading accuracy (°)*	0.12
Roll / Pitch accuracy (°) RMS**	0.05
Alignment Time (min)***	5 to 12 minutes, dependent on latitude

\* SecLat 1σ

\*\* RMS 1σ

\*\*\* Static

## SYSTEM CHARACTERISTICS

### Gyroscopes

Type: 3-axes FOG  
 Bias stability: >1 deg/hr (measured over 1 month)  
 ARW:  $\geq 0.0037\sqrt{\text{hr}}$   
 Max angular rate: 495°/s

### Accelerometers

Type: 3-axes MEMS  
 Scale Factor stability: 300 ppm (typ measured over 1 year)  
 Bias stability: 3.75 mg (typ measured over 1 year)

### Environmental

Operating Temperature: -40°C to +71°C  
 Storage Temperature: -55°C to +85°C  
 Vibration: IEC 60068-2-6  
 Shock (survival): IEC 60068-2-27  
 Humidity: < = 95% RH

### Power requirements

Input voltage: 18-35V  
 Power consumption: 18W

Export restrictions: None  
 ROHS: Yes

### Connectors

J1: Power, Serial Bus & Test

### Interface

Type: RS422 serial  
 WiFi IEEE 802.11 g 2.4GHz  
 Protocol: JSON

### Physical Properties

Dimensions: 106x132x223mm  
 Weight: 4.2kg  
 Rating: IP67