

## Stepper motor micro stepping based Dual Gimbal Antenna Drive Electronics

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has developed Stepper motor micro stepping based Drive Electronics for Dual Gimbal Antenna. Innovative Real Time Precise Position Tracking scheme with Stepper Motor using Frequency Modulation based Micro stepping.



Drive Electronics



DGE Controller Card

### Salient Features

- ✦ Design and implementation of Frequency modulation-based stepper motor micro stepping drive scheme.
- ✦ Reference based motor drive in Open loop control.
- ✦ PWM chopper-based motor current controller implementation.
- ✦ Motor drive directly through Satellite Raw Bus (28-42V).
- ✦ Capable of meeting high antenna pointing accuracy at higher speeds in real time.

## Major Specifications

Motor Supply voltage range	15V-40V
Motor maximum drive current	1.0A
Maximum angular tracking rate	6.0 deg/s
Maximum angular acceleration	1.0 deg/s <sup>2</sup>
Motor control scheme	Open loop Micro step drive with Programmable micro stepping options
TC, TM interface	Mil Std 1553B
Position Sensor	Resolver, single speed, 3.0 arc minutes accuracy
Resolver carrier excitation	2kHz, 4V rms, sinusoid carrier
DC DC converter	30W, ART2815T/M3G
Primary Raw Power (Electronics)	~7.5W
Mass of the drive package	~3.5kg
Package Dimension	267 x 189 x 119 mm <sup>3</sup>
Targetted Antenna Pointing accuracy (System Level)	0.3deg
System redundancy	Yes

## Technology Transfer

URSC-ISRO offers to transfer this technology of Stepper motor micro stepping based Dual Gimbal Antenna Drive Electronics to industries in India with adequate experience and facilities. Industries interested in obtaining knowhow may write giving details of their present activities, infrastructure and facilities.

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🌐 <https://www.ursc.gov.in/industry/index.jsp>