

## Pointing Accuracy and Auto TX Shutdown

We, Intellian Technologies, Inc. hereby certifies that the Intellian GX60 will maintain a stabilization pointing accuracy of better than 0.2 degrees and will automatically cease transmission within 100 milliseconds if the pointing error should exceed 0.5 degrees and will not resume transmission until the error drops below 0.2 degrees.

### Product Information:

<b>Product Name:</b>	Intellian GX60, 65cm Ka-band Maritime Stabilized Antenna System
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### Background:

Intellian GX60 employs closed loop servo systems to keep the antenna pointed accurately at the satellite. The closed loop servo system includes highly accurate sensors continuously to monitor the antenna's position in inertial space. In the normal operation, the servo mechanism keeps the antenna pointing within  $\pm 0.1^\circ$  degrees RMS and the pointing accuracy is approximately  $0.2^\circ$  peak. However there always exists the possibility that unexpected conditions will cause the antenna to deviate outside this normal operation.

Examples of some possible conditions are:

- Unexpected mechanical disturbance from an external source.
- Mechanical malfunction.
- Ship motions beyond the pedestal specifications which cause very large accelerations on the axes.
- Failure of one or more drive motors.
- Sensor malfunction (Rate Sensors, GPS, Gyrocompass).

### Antenna Pointing Accuracy:

At all times, the ACU (antenna control unit) continual monitors the antenna position as part of the normal servo loop operation of the antenna and compares a running average of the measured azimuth and elevation to the desired azimuth and elevation positions. If the antenna becomes miss-pointed by exceeding  $0.5^\circ$  from the axis of the main lobe of the target satellite, then the ACU will send a "cease transmissions" signal by providing a TX MUTE instruction to the below-deck satellite modem within 100 milliseconds. The ACU will suppress the signal until the off-axis angle is within  $0.2^\circ$  of the target satellite.

**Authority:** **Kevin Eom/  
CTO,  
Research and Development**

**Signature:** 

**Date:** **December 11, 2014**

## Pointing Accuracy and Auto TX Shutdown

We, Intellian Technologies, Inc. hereby certifies that the Intellian GX100 will maintain a stabilization pointing accuracy of better than 0.2 degrees and will automatically cease transmission within 100 milliseconds if the pointing error should exceed 0.5 degrees and will not resume transmission until the error drops below 0.2 degrees.

### Product Information:

<b>Product Name:</b>	Intellian GX100, 1m Ka-band Maritime Stabilized Antenna System
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### Background:

Intellian GX100 employs closed loop servo systems to keep the antenna pointed accurately at the satellite. The closed loop servo system includes highly accurate sensors continuously to monitor the antenna's position in inertial space. In the normal operation, the servo mechanism keeps the antenna pointing within  $\pm 0.1^\circ$  degrees RMS and the pointing accuracy is approximately  $0.2^\circ$  peak. However there always exists the possibility that unexpected conditions will cause the antenna to deviate outside this normal operation.

Examples of some possible conditions are:

- Unexpected mechanical disturbance from an external source.
- Mechanical malfunction.
- Ship motions beyond the pedestal specifications which cause very large accelerations on the axes.
- Failure of one or more drive motors.
- Sensor malfunction (Rate Sensors, GPS, Gyrocompass).

### Antenna Pointing Accuracy:

At all times, the ACU (antenna control unit) continual monitors the antenna position as part of the normal servo loop operation of the antenna and compares a running average of the measured azimuth and elevation to the desired azimuth and elevation positions. If the antenna becomes miss-pointed by exceeding  $0.5^\circ$  from the axis of the main lobe of the target satellite, then the ACU will send a "cease transmissions" signal by providing a TX MUTE instruction to the below-deck satellite modem within 100 milliseconds. The ACU will suppress the signal until the off-axis angle is within  $0.2^\circ$  of the target satellite.

**Authority:** **Kevin Eom/  
CTO,  
Research and Development**

**Signature:** 

**Date:** December 11, 2014