# INTRAC 605 Antenna Control Unit

## Monopulse Antenna Tracking Controller for Antennas up to 35 meters


## Features

- High performance, maximum flexibility and high reliability for antennas up to 35 meters in diameter
- Monopulse tracking backed up by INTRAC™ orbit modelling algorithm offers the highest tracking Integrity
- Full continuous servo control of both axes simultaneously
- Accurately tracks satellites with orbital inclinations up to and beyond 10°
- Average tracking signal degradation less than 0.05dB
- Accepts very high-resolution optical encoders (up to 21 bits, 0.5 arc second). Options to use high-resolution resolvers (19 bits, 2 arc seconds).
- Compatible with INTELSAT and EUTELSAT SCPC tracking specifications
- INTRAC algorithm tolerates signal fluctuations that defeat step track and memory track controllers
- Resilient to tracking or monopulse signal loss, maintaining tracking integrity for up to 72 hours by predicting from internal model.
- Non-volatile memory ensures tracking is resumed after power failure

## Overview

The INTRAC™ 605 Monopulse Antenna Controller enables satellite earth station antennas to accurately track geosynchronous satellites with orbital inclinations up to and beyond 10°. The system offers superior tracking integrity with a full continuous servo control suitable for all antennas up to 35m diameter.

The system comprises two interconnected units, the INTRAC ACU and the Monopulse Interface unit (MIU) that together implement Monopulse tracking supplemented by the INTRAC (INtelligent TRacking Antenna Control) algorithm, which has been developed and refined over a 20-year period. In the event of monopulse receiver failure, It provides an alternative tracking system with an accuracy accuracy comparable to monopulse that exhibits exceptional immunity to propagation disturbances and fades and maintains reliable pointing accuracy even at low angles of elevation in regions of high scintillation. The INTRAC 605 is compatible with INTELSAT and EUTELSAT SCPC tracking specifications and is resilient to loss of tracking and monoplulse signals; the unit will maintain tracking integrity by predicting from its internal model for blackout periods up to 72 hours. The non-volatile memory ensures that accurate tracking is resumed after power failure
The system features full remote monitoring and control via a remote control interface as well as full front panel control and supports a wide range selectable operating modes, including satellite acquisition and operation in program track mode using INTELSAT IESS-412 or NORAD data. The continuous servo control enables a fully variable speed manual control capability.

The INTRAC 605 offers full servo dual main axis (including counter torque systems) and polarization control. It drives both main axes simultaneously and continuously while maintaining an average tracking signal degradation less than 0.05dB. It also offers a wide range of auxiliary output options and interlocks, including stow pin drive, brake control and preliminary limit switches (in addition to normal final limits and soft limits).
The INTRAC 605 features a large, multi-line backlit display and can be supplied with an integral L-Band beacon receiver (single channel for INTRAC algorithm tracking).

# INTRAC 605 Antenna Control Unit

## SPECIFICATIONS

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| Operational modes | Standby, Manual (Jog), Manual (Velocity), Search Scan, Remote Control<br>Auto (Monopulse), Auto (INTRAC), Program Track, IESS-412 Pre-set (Position Designate) |
| Tracking Accuracy | Typically better than 0.05dB RMS signal degradation after tracking for 24 hours (with tracking signal), for orbit inclinations up to 10° |
| Prediction Accuracy | Typically better than 0.05dB RMS signal degradation over 72 hours (after loss of tracking signal), for orbit inclinations up to 10° |
| Battery Backup | Model data stored in EEPROM and real time clock supported by battery backup in the event of power failure |
| Configuration Memory | Configuration data is stored in EEPROM |
| Monopulse Tracking Signals | Error signals provided by external Monopulse receiver. Co-ordinate rotation (for beam waveguide antennas) and cosecant correction performed in INTRAC-605 |
| External Error Signals | Voltages varying directly with error in 2 orthogonal axes (normally elevation and cross-elevation)<br>Sensitivity 1.0V to 10V /degree<br>Digital inputs for validity signals |
| INTRAC Tracking Signal | May be derived from an external tracking receiver or optionally from the integral IBR-L beacon receiver |
| External Tracking Signal | Voltage varying directly with received signal strength (in dB).<br>Sensitivity 0.1V / dB to 1.0V / dB<br>Offset + / - 10 volts max<br>Lost Lock input, contact closure when tracking signal is lost (can be inverted). |
| Internal IBR-L | This option accepts an L-Band signal, with an input level of -80 to -45dBm.<br>The signal voltage and lock lost indicators are generated internally. |
| Display | Graphics LCD display giving the areas of information:<br>Azimuth angle, Signal strength, Elevation angle<br>Diagnostics, Polarization angle, On-line help<br>Mode of operation, Operational menus, Configuration menus |
| Limit Switches | Limit switch inputs for elevation, azimuth and polarization. Contacts normally closed |
| Motor Drive | Drive enable and Velocity demand signals to control a velocity servo drive cabinet. Full continuous closed loop position servo control is implemented by the INTRAC simultaneously on both main axes. |

## OPTIONS

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| Polarization | Manual control of polarization axis motor, polarization angles displayed on screen. |
| Beacon Receiver | Eliminates the need for an external tracking receiver (INTRAC algorithm mode). Beacon frequency is selected over a range from 948 to 1700 MHz from the INTRAC front panel. |
| Remote Control Terminal | IBM PC compatible software is available to provide a remote control terminal function. This terminal monitors and controls the INTRAC via the standard serial remote control port. |

## PHYSICAL

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| Temperature Range | 0 to 40°C - Operating<br>-25°C to 85°C - Non Operating (storage) |
| Humidity | 5% to 95% RH non condensing - Operating<br>0% to 99% RH non condensing - Non Operating (storage) |
| Altitude | 10,000 feet max |
| Input Power | 110 or 230V, single phase, 50/60Hz, 50W |
| Dimensions | 2 Units each 483mm (W) x 132mm (H) x 406mm (D). |
| Mounting | 19" rack mounting units, 2 x 3U high. |
| Weight | 24 kg |

## STANDARDS

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| Designed to Meet | EN55022 and EN50082-1 (Europe)<br>FCC P.C.B. Part 15, Subpart B Class A (USA) |


**NORTH AMERICA**
*USA*
Tel: +1 678 889-1831
Fax: +1 678 889-1756
info.usa@advantechwireless.com

*CANADA*
Tel: +1 514 420 0045
Fax: +1 514 420 0073
info.canada@advantechwireless.com

**EUROPE**
*UNITED KINGDOM*
Tel: +44 1480 357 600
Fax: +44 1480 357 601
info.uk@advantechwireless.com

***RUSSIA & CIS***
Tel: +7 495 971 59 18
info.russia@advantechwireless.com

**SOUTH AMERICA**
*USA*
Tel: +1 678 889-1831
Fax: +1 678 889-1756
info.latam@advantechwireless.com

*BRAZIL*
Tel: +55 11 3054 5701
Fax: +55 11 3054 5701
info.brazil@advantechwireless.com


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