

# NGC2 INDOOR UNIT (IDU)



## OVERVIEW

The Kratos NGC2 Antenna Control System is the new advanced level antenna control system intended for applications with demanding tracking requirements, complex geometries, and dynamic conditions assuming the antenna mount is compatible to the mission.

The NGC2-IDU is designed to operate on GEO/LEO/MEO/EOS satellites.

The NGC2 Antenna Control System offers precise, user-friendly control over the basic motorization kits for Kratos antennas with sizes 2.4 meters and up.

The NGC2-IDU features a SmarTrack® predictive tracking mode that utilizes a patented Three-Point Peak Algorithm that saves wear on the antenna motors and jacks.

The NGC2-IDU provides convenient features such as straightforward color graphics, LCD touch screen interface, and a number of powerful remote control software protocol options, the NGC2 Antenna Control System is an ideal solution for medium- to large- sized earth stations requiring complex pointing and tracking functions.

## DESIGN FEATURES

- **Graphical User Interface** – Common shared interface design between controller, handheld, remote software package. Enables ease of use, reduced training, and advanced graphical operations & diagnostics.
- **Open, Standards Based Platform** – Non-proprietary hardware and software design based on proven and reliable technology.
- **Connectivity & Control** – Full complement of hardware interfaces for legacy and next generation technologies providing flexible accessibility for system networking, monitoring, control and maintenance.
- **Flexible Modular Upgrade Architecture** – Designed for field upgradable drop-in flexibility of hardware and software enhancements for expanded functionality.
- **Fiber Optic Interfacility Link** – SFP based interface to the NGC-ODU or NGC2-ODU for secure and reliable communications, and fiber-optic SFPs allows protection against lightning, interference and transient voltage.
- **Cybersecure** – NIST-800-171 Compliant, Information Assurance Assessment, and Penetration Testing, Assignable User levels restricting functional rights.

# NGC2 INDOOR UNIT (IDU)

## NGC2 SYSTEM DESCRIPTION

The NGC2 system is physically divided into an Indoor Unit (NGC2-IDU) and an Outdoor Unit (NGC-ODU or NGC2-ODU), connected by a user selectable SFP.

The Indoor Unit is a site control element that can access one antennas (multiple antennas in future software), and serve as a gateway to the customer's management and control plane.

The rack-mounted Indoor Unit appliance (NGC2 IDU) is a Linux-based industrial control device that occupies 4RU and contains a multi-core ARM processor, display, networking switches, storage, and control software to manage the local user interface and provide control/management plane interfaces. This may be selected if a site needs low IT presence, if the customer is uncomfortable with more complex IT, or if the installation/operation process needs to be more 'plug and play'.

The NGC2 IDU is more tolerant of environmental variation than most blade servers, so it could be the appropriate selection if the "indoor" equipment is in fact located out-of-doors.

All tracking functions are isolated to the NGC2-IDU, which as mentioned is indoors, where the beacon receiver or other signal measurement device will be located. Future NGC2-ODUs will do closed loop tracking at the antenna.

All motion control functions are isolated to the NGC2-ODU, which is located on positioner or pedestal, allowing termination of all local control cables after short runs and minimizing interconnection between indoor and outdoor to AC power, transmit and receive signals, and typically a single control fiber pair.

The Kratos NGC2-IDU is a modular, scalable, adaptable advanced-level antenna pointing and tracking controller intended for motorized satellite earth station antennas used with LEO, MEO, GEO, EO communications satellites.

The NGC2 provides the following basic and optional features:

- Motor control for two- and three-axis NGC-ODU motor systems complying with the standard Kratos interface, using sub amplifiers for VFDs for driving the Az and El axes
- Support for single speed AC or DC Pol rotators
- Automatic positioning of antennas to pre-programmed look angles
- Motor control for XY and P4800 products (option)
- The IFL is SFP based so it can be fiber or ethernet
- Local control from the indoor unit through an advanced touch screen LCD
- 10/100/1000 BaseT Ethernet interface for external M&Cs (via the IDU)
- Remote control through network-based protocols, including RESTful API, MQTT.
- Optional integral beacon receiver interfaces to support Kratos patented three-point peaking step-track and SmarTrack® hybrid feedback/predictive program tracking algorithms
- NORAD and Intelsat program tracking
- Monopulse tracking for Ka-band applications (requires optional hardware)
- Optional integrated subreflector tracking (SRT) capability for high-accuracy Ka-band tracking, including hybrid main dish and SRT positioning and tracking

# NGC2 INDOOR UNIT (IDU)

## USER INTERFACE

### NGC2-IDU Front Panel

The NGC2-IDU front panel has an 1920x720 24-bit color screen. From this interface, the user can perform all functions to configure, control, and monitor operation of the antenna.

The front panel also includes USB, HDMI and Ethernet

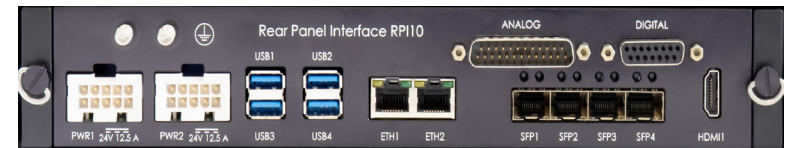


### NGC2-IDU Touch Screen Display

The touch screen display is the key component to control the NGC2-IDU. By its optimized design the NGC2 provides intuitive and easy to use menus.

### NGC2-IDU Back Panel

The NGC2-IDU provides four USB ports used to connect human interface devices such as a mouse, keyboard or other peripheral devices, two Ethernet 10/100/1000 ports to connect to a customer-provided Ethernet LAN, one Analog port to interface with an external beacon receiver, one HDMI port to connect an external monitor and four SFP Ports to support Ethernet SFP modules for fiber optic or copper connection.



The NGC2-IDU Back Panel provides also multiples slots for hardware expansion without the need of opening the unit to install these modules.

Wide bay dims are approx. 11.3" Width x 8.25" Deep x 1.75" High  
 Small bay dims are approx. 4.65" Wide x 8.25" Deep x 1.75" High



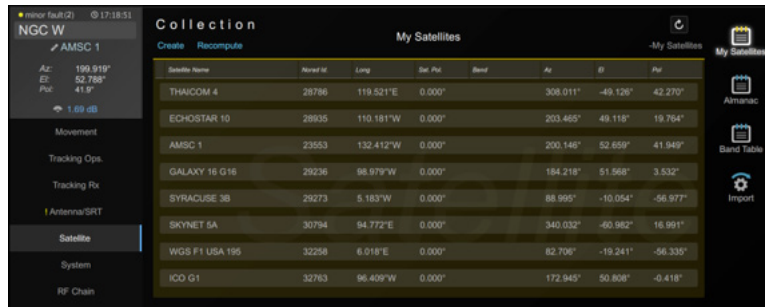
# NGC2 INDOOR UNIT (IDU)

## SATELLITE MEMORY and TRACKING

### SATELLITE DATABASES FUNCTIONS

The NGC2-IDU can hold 5000+ satellites in our satellite almanac any number of which can be designated to a favorites list which is used functionally throughout the system. The satellite almanac table can be updated from a Celestrak or Space-Track.org geo.txt file, including NORAD TLEs, JSON, KVN, OMM XML using a USB flash jump drive or from the network.

Note: The Ephemeris tables should be manually updated periodically.



### EXTERNAL BEACON RECEIVER INTERFACE

The NGC2-IDU can interface to any external analog beacon receiver with a 0-10V DC output. Other output ranges are not recommended and may in fact be harmful.

The NGC2-IDU can also be supplied with an internal Kratos beacon receiver.

### TRACKING ALGORITHMS

The NGC2-IDU supports several tracking algorithms.

- Three-point peaking step-track.
- SmarTrack® hybrid feedback/predictive program tracking
- NORAD ephemeris predictive tracking
- Intelsat Ephemeris predictive tracking
- Monopulse for Ka band application with optional hardware
- TLE tracking

The NGC2-IDU automatically calculates expected 3dB beamwidth from antenna size and downlink frequency. The stepsizes can be configured as a fraction of the 3dB beamwidth. The sensitivity of the tracking algorithms can be configured.

The NGC2-IDU will perform limited signal processing on the tracking signal. This includes wild point removal and averaging to eliminate fluctuations. These functions are parameterized and can be customized for the application from the front panel. For analog interfaces, significant oversampling is used to statistically detect scintillation and reduce its effects.



# NGC2 INDOOR UNIT (IDU)

## NGC2 MONITOR AND CONTROL

### ETHERNET TCP/IP

The NGC2-IDU includes an Ethernet 10/100/1000 interface running TCP/IP. The NGC2-IDU must be configured with a static IP4 address. The current product does not support IPv6, but this will be implemented in a future software release.

### PROTOCOLS

The NGC2-IDU supports management through RESTful API, and MQTT.

### TIME

The NGC2-IDU supports the Network Time Protocol and can use this feature to keep its local time synchronized. All system time is in UTC, no local time zones are used or supported.

### REMOTE CONTROL

A version of the NGC2-IDU front panel software suitable for running on Windows PCs is available for remote access to multiple NGC2-IDU.

### FAULT LOGGING

The NGC2-IDU keeps lists of current, latched, and acknowledged (ACO) alarms, and keeps a time-based history of alarms and other significant events.

These logs can be viewed from the user interface.

### DATA EXPORT

The NGC2-IDU can import and export all configuration files via the USB jump drive, and can save internal log files to the USB jump drive on request.

The NGC2-IDU keeps position, tracking, event/fault, and audit logs for up to one year, but provides an automatic purge function for file management. These files are stored as comma-separated-value (CSV) files and are thus compatible with common office suites for analysis and evaluation.

### SOFTWARE UPDATE

Software Update of the NGC2-IDU is typically accomplished using the jump drive. The NGC2-IDU can also be updated by pushing data through manual installation with SSH and SCP.

# NGC2 INDOOR UNIT (IDU)

## STANDARD SOFTWARE FEATURES

### STEP TRACKING SOFTWARE

The step-track algorithm uses the patented “three point peaking” (3PP) approach, where the antenna is peaked by fitting measured signals to the parabolic loss curve. This gives greater resolution than traditional signal-balancing step-track in less time.

### SMARTRACK TRACKING SOFTWARE

The SmarTrack® algorithm is based on building a mathematical model of observed satellite orbit from the history of Az & El readings during tracking. Once sufficient data is collected to build a reliable model, the system switches to a predictive mode and uses occasional peaking to update the model. The quality level of this model is measured and provided in dB by computing the RMS error between the model's predictions and actual peaking points on the tracking status screen.

### PREDICTIVE TRACKING SOFTWARE

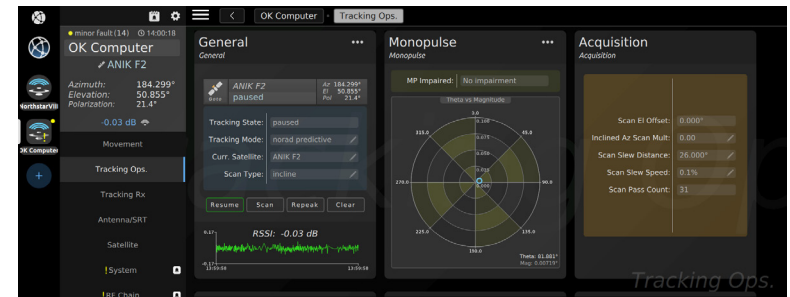
The predictive NORAD or Intelsat tracking mode, regenerates periodically a new angle from the loaded model. The rate at which this happens depends on how much the model indicates satellite appears to be moving.

### ACQUISITION ASSIST SOFTWARE

The acquisition assist is a feature that allows TriFold® antennas to search for likely satellites that match the configured parameters. It requires hardware options including a beacon receiver and sensor package.

### MONOPULSE TRACKING SOFTWARE (NGC2-116)

This software provides monopulse tracking capabilities to the NGC2-IDU. This software requires a Kratos monopulse feed system installed on the antenna.



### SPECTRUM ANALYZER ENHANCED USER INTERFACE

This software provides additional operational capabilities to the spectrum analyzer card giving access to functions available to test equipment such as: CF, Span, VBW, Absolute Power Measurement Functions. It requires the NGC2-002-EDR option.

# NGC2 INDOOR UNIT (IDU)

## SOFTWARE FEATURES (cont)

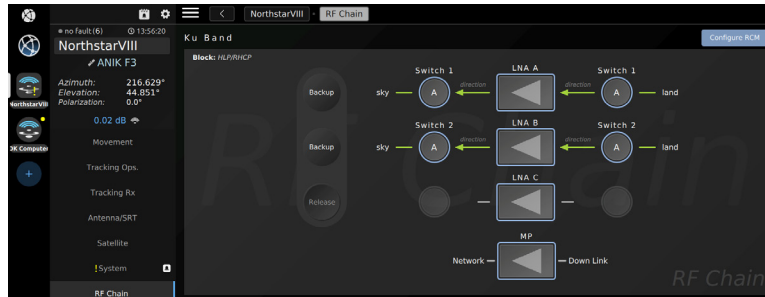
### EXTERNAL DEVICE SWITCHING SOFTWARE

This software is used in conjunction with NGC2 Redundancy or NGC2 waveguide switch matrix control. This software enables the display and control of components and waveguide/coax switches, eliminating the need for dedicated component redundancy controllers. A complete range of LNAs and LNBs are available in various frequency bands.

Refer to the Kratos product bulletins for more information.

### SAND/DUST DEVIATOR FEATURE SOFTWARE

This software is used in conjunction with the precipitation deviator and periodically forces high velocity air across the feed window



to remove sand or dust. This software requires the Precipitation Deviator and the NGC-AESC Kits.

### HIGH AVAILABILITY SYSTEM REDUNDANCY

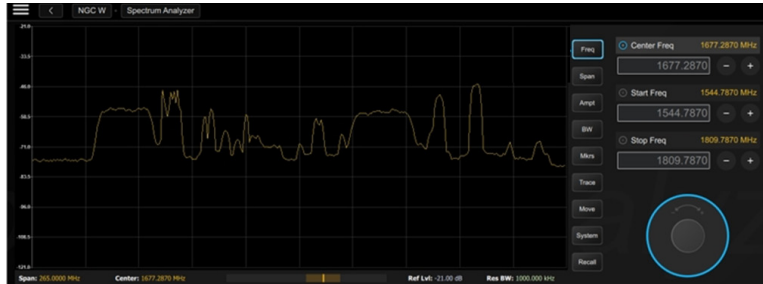
This software provides redundancy for the NGC2-IDU. The master NGC2-IDU will periodically synchronize all parameters with the slave unit at user selected intervals. If a failure is sensed, a fault will occur and the service will revert to the slave. This software requires hardware to be installed in the NGC-ODU.

# NGC2 INDOOR UNIT (IDU)

## OPTIONAL HARDWARE FEATURES

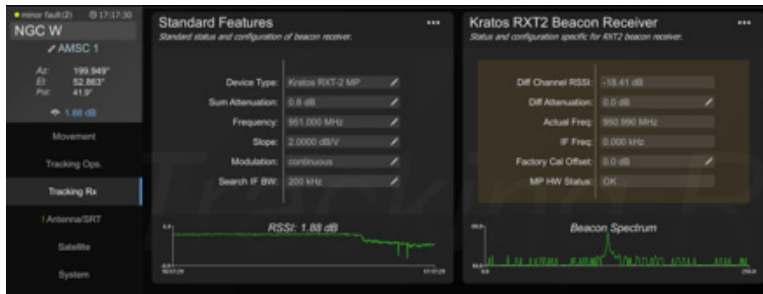
### SPECTRUM ANALYZER ANALOG (NGC2-002-EDR)

This option allows to monitor the L band spectrum and to make measurements using the enhanced user interface spectrum analyzer software.



### BEACON RECEIVER (NGC2-004-03)

This single input L band internal beacon receiver is entirely controlled by the IDU, the system can select one of the two inputs and configure all the RF parameters. this beacon receiver is also capable of monopulse tracking.



The beacon receiver is also available with 2 channels, Monopulse capabilities as well as in 1RU rack mount and outdoor versions.

### REDUNDANT POWER SUPPLY (NGC2-008)

In addition to the external power supply provided with the NGC2-IDU, a second unit can be installed to add PS redundancy capabilities

### RACK SLIDES (NGC2-009)

These rack slides are required when using deep rack units, they secure the IDU unit during maintenance or configuration

### ESTOP RACK MOUNTED (NGC2-010-xx)

This option provides a rack mounted emergency stop button for the NGC2-IDU.

## OPTIONAL EXTERNAL HARDWARE FEATURES

### ENVIRONMENTAL SYSTEM CONTROLLER (NGC-AESC)

This option is connected to the NGC-ODU via the NGC Bus, and provides monitor and control capabilities of the de-ice system, precipitation deviator, feed heater, hub heater and can be connected to an optional weather station. All the information are controlled and displayed from the NGC2-IDU touch screen display.

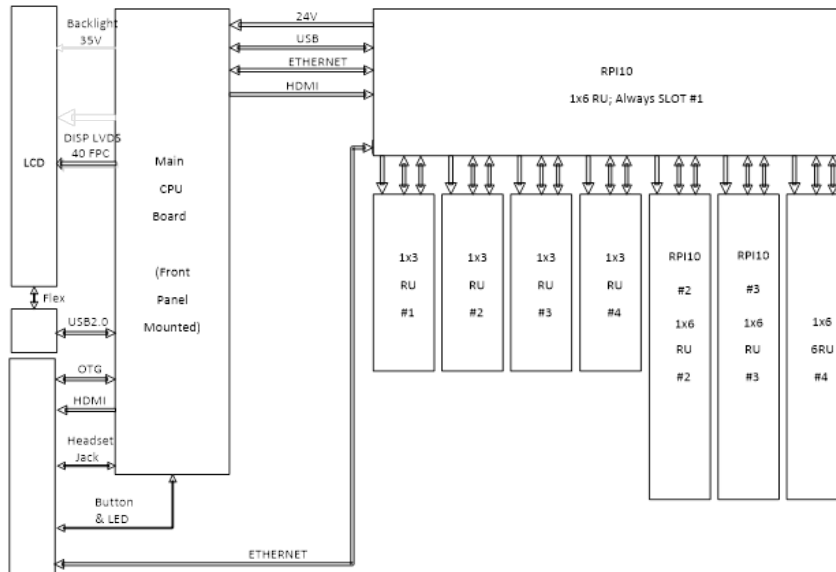


# NGC2 INDOOR UNIT (IDU)

## INDOOR UNIT PHYSICAL HARDWARE

The NGC2 IDU hardware platform consists of

- An SCP10 main processor board with an NXP I.MX-based quad core processor running the Linux operating system with a solid state disk for log and data storage, and display interface capability
- An RPI10 rear panel interface board containing
  - A 14-port network switch that supplies four (4) SFP ports, two Gigabit ethernet ports, and up to 8 internal Gigabit Ethernet ports. These switches can be connected together to form an extended switching platform. Each board's Ethernet switch can use transparent VLANs to segment the network into security domains.
- Four USB Type A jacks for accessory connection externally and 8 USB Type A jacks for accessory connection internally.
- Redundant 24VDC power supply inputs
- Relay contact closure outputs
- Four (4) narrow- and three(3) wide-format expansion slots, which may be used for:
  - NGC2-004-03 beacon receiver
  - NGC2-002-EDR spectrum analyzer
  - NGC2-005-1X8 Coaxial Switch
  - Other future options



# NGC2 INDOOR UNIT (IDU)

## NGC2-IDU Options

Hardware	
NGC2-IDU	NGC Rack Mounted Antenna Controller W/LCD Touch Panel, 4 RU Unit
NGC2-IDU-2	NGC Rack Mounted Antenna Controller, 2 RU Unit
NGC2-002-EDR	NGC2-IDU Spectrum Analyzer Card - Analog; Enhanced Dynamic Range
NGC2-004-03	NGC2 IDU, Single Channel, L-Band Internal Beacon Receiver
NGC2-004-03-2	NGC2 IDU, Dual Channel, L-Band Internal Beacon Receiver, Separate Tuner
NGC2-004-MP	NGC2 IDU, Dual Channel, Monopulse L-Band Internal Beacon Receiver, Single Tuner
NGC2-004-MP-X	NGC2 IDU, Dual Channel, Monopulse L-Band 1RU Beacon Receiver, Single Tuner
NGC2-004-I03-02-IDU	NGC2 IDU, Dual Channel, Monopulse L-Band Outdoor Beacon Receiver, Single Tuner
NGC2-005-1X8	NGC2-IDU, 1x8 Coaxial Switch, 10-6000MHz
NGC2-008	NGC2-IDU, Power Supply
NGC2-009	NGC2-IDU, Rack Slides
NGC2-010-025M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 25M IFL
NGC2-010-050M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 50M IFL
NGC2-010-075M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 75M IFL
NGC2-010-100M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 100M IFL
NGC2-010-150M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 150M IFL
NGC2-010-250M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 250M IFL
NGC2-010-300M	NGC2-IDU, ESTOP, Rack Mount, 1RU, 300M IFL
Software	
NGC2-117	NGC2-IDU, Constellation Tracker

## NGC2-IDU Specifications

Dimensions	Width 19 inches x Height 7 inches x Depth 17.25 inches Rack Mountable 4RU
Weight	25 lbs (approx.)
Weatherproofing	IP32
Operational Temp.	-30 deg to +55 deg Celsius
Storage Temp.	-40 deg to +85 deg Celsius
Humidity	0 - 95% RH Non Condensing
Shock	ISTA 1A
Vibration	IEC 60068-2-6 NEBS Zone 4 Earthquake
AC Power	90 – 264 VAC; 47-63Hz; Single Phase; @115VAC < 3.0A RMS @230VAC < 1.5A RMS @115VAC Better than 0.95 Power Factor @230VAC Better than 0.90 Power Factor



**KRATOS**<sup>®</sup>  
READY FOR WHAT'S NEXT™



Kratos Antenna Solutions  
3801 E. Plano Parkway, Suite 200  
Plano Texas 75074  
USA  
Phone: +1-214-291-7654  
Fax: +1-214-291-7655  
Email: [space@kratosdefense.com](mailto:space@kratosdefense.com)

for information visit: [www.kratospace.com](http://www.kratospace.com)

© 2026 Kratos Defense & Security Solutions, Inc.