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Vaisala Sigmet
Radar and Antenna Control Processor RCP8™

Features

The Vaisala Sigmet RCP8™ is the 3rd generation radar/antenna control processor. It is a proven, trusted product, re-hosted on a PC/Linux platform:

- PC/Linux architecture in standard PCI package
- Flexible I/O via the Vaisala IO-62 PCI card
- Rackmount backpanel for easy signal connection
- Configurable digital antenna servos with built-in simulator
- Comprehensive static discharge protection
- Front panel active matrix display of AZ/EL
- Fail-safe watchdog software to protect antenna
- Programmable control logics for custom fault response
- Optional moving platform stabilization
- Output via 10/100/100T Ethernet or RS232C serial line
- Can run as a separate "thread" on Vaisala Sigmet IRIS™ Radar Control Workstation (RCW)
- Public API's

Connecting a Weather Radar to the Outside World

The purpose of a controller is to provide a simple interface between high-level user applications to the various electrical signals that are required to control and monitor a radar and antenna system. The RCP8™, our PCI/Linux based controller, provides the flexibility to connect to radar systems from a variety of manufacturers. With comprehensive BITE monitoring, wide range inputs and programmable control logics, the RCP8™ offers outstanding versatility in the field. We provide a fully documented API so that sophisticated users can develop their own application software. Specify the RCP8™ for weather radar upgrades or for new weather radar systems. Of course the RCP8™ is 100% compatible with the IRIS™ software for UNIX workstations.

Flexible Algorithms for Ground-Based and Stabilized Moving Platform Applications

The RCP8™ implements digital position and velocity servos that are more flexible than traditional analog servos- there are no pots to tweak to tune the servos. Because of the digital approach, the servo feedback can be easily adjusted to stabilize virtually any weather radar antenna system. The RCP8™ is so flexible that it is the favorite controller for shipboard weather radar applications since it can connect to an inertial navigation unit and compensate for ship motion to 0.1 degree.

Comprehensive Over Voltage Protection for I/O Lines

The I/O-62 PCI card serves as the gateway for signals in and out of the RCP8™. Each I/O line is configured with a fast switching diode to protect it against transient high-voltage spikes from lightning or other sources. This is important since radar systems are often sited in locations that are prone to lightning strikes.

Fail-Safe Protection for Your Investment

A radar antenna is a costly item. To protect this investment, the RCP8™ provides the most comprehensive fail-safe features in the industry. For example, a watchdog program constantly checks for consistency between the tachometer vs position angles, for velocity over-speed, unresponsive antenna and out of tolerance elevation angles. Aside from these built-in safety checks, the RCP8™'s programmable control logics allow users to create their own custom monitoring/response actions (e.g., alarm bells, warning lights, transmitter shutdown, etc.).

Technical data

RCP8™ I/O Characteristics

EXPANDABLE I/O
I/O-62 PCI card (one standard) with RCP8™ rackmount backpanel

AZ AND EL ANGLE INPUTS
TTL 16-bit binary or BCD for AZ and EL or Synchro/Resolver (various frequencies supported)

AZ AND EL ANGLE OUTPUTS
Parallel TTL Binary angle up to 16 bits, or serial RS232 Asynch

TACH INPUTS
Analog up to ± 80 V

ANTENNA DRIVE OUTPUT
+ 10 V to servo amplifiers for AZ and EL

STATUS BIT INPUT RANGE
Switch closure or wide range ± 27 V triggering at +2.5V. 330K input impedance. +5V pull-up/down configurable by in software

CONTROL BIT OUTPUT RANGE
TTL. In addition 2 DIP relays are provided for switch closure output

A/D INPUTS
12 A/D inputs nominal ± 6V, 12 bits @ 100 Hz

HOST INTERFACE
10/100/1000T Ethernet or RS232C asynch serial selectable to 39 Kbps

Antenna Control/Monitoring Features

SERVO TYPES
Digital position and velocity servos for both AZ and EL (independent)

TACHOMETER
Analog TACH or "Virtual Tach" from differentiated angle input

VELOCITY SERVO ACCURACY
0.5% at 3 RPM typical

POSITION ACCURACY
0.1 degrees typical

FAIL SAFE CHECKS
Soft limiting, out-of-bound elevation request limiting, out of bound elevation, limit switch diode clamping, limit switch shutdown, out of bound antenna speed, unresponsive antenna, tach and angle changes inconsistent, "dead" host computer

DISPLAY
Front panel 2-line user configurable display to show AZ and EL positions and velocities as well as status parameters and faults. Optional keyboard, mouse and monitor

Radar Control/Monitoring Features

DEDICATED CONTROL OUTPUTS
Servo Power, Radiate, T/R Power, Pulse Width (4), Reset Signal

DEDICATED STATUS INPUTS
Servo Power, Radiate, Standby, Wave Guide Pressure, Interlock, Cooling Airflow, Pulse Width (4), Antenna Local Mode

OTHER INTERFACES
GB-IB, CANbus

Configurable BITE Monitoring and Control Features

BITE STATUS/CONTROL INPUTS
Up to 80 lines configurable in groups of 8 to be either input or output

Moving Platform Option

MOTION REFERENCE
Honeywell or Seatec INU with GPS update and serial output

Physical and Environmental

PACKAGING
2U or 4U EIA 19" rackmount chassis. 3U rackmount connection panel

INPUT POWER
85-264 VAC, 47-63 Hz

POWER CONSUMPTION
70 Watts

ENVIRONMENTAL
0C to 50C operating, 0 to 95% (non condensing) R.H.

RELIABILITY
>50,000 Hours MTBF

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