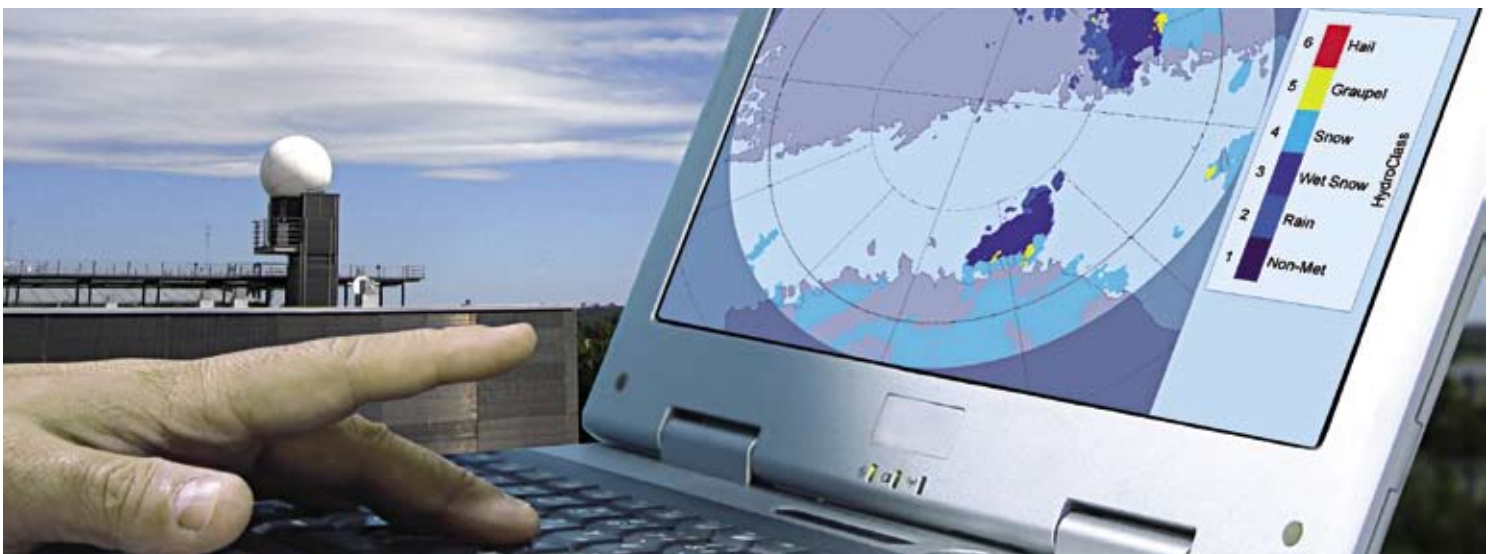


More than just a pretty picture

/ VAISALA SIGMET INTERACTIVE RADAR
INFORMATION SYSTEM IRIS™



VAISALA

Vaisala Sigmnet Interactive Radar Information System IRIS™

Three decades running and better than ever



In today's business world, companies and their high-tech products come and go in the blink of an eye. That's why we are proud that IRIS™ is the longest-selling software system for weather radar— ever.

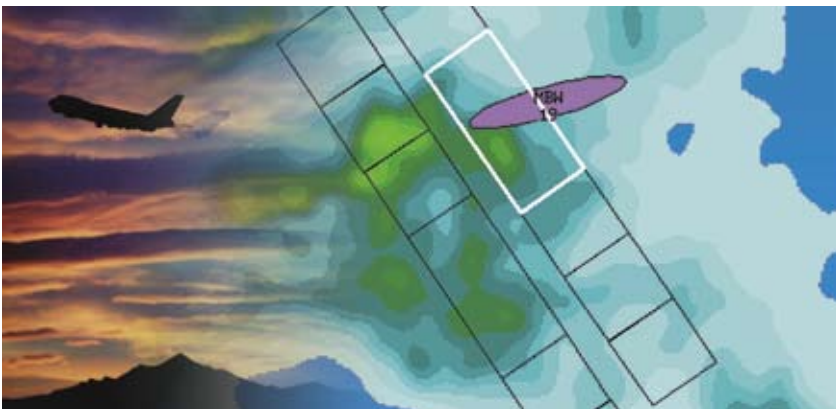
IRIS™ has been shipping as a product for over 20 years. What do you get when you spend millions of dollars and 20 years of hard work by a dedicated team of professionals? The most comprehensive, user-friendly, robust software package in the industry!

Customers make the IRIS™ choice

IRIS makes any weather radar better. Vaisala is totally focused on providing the highest quality signal and data processing solutions, and the system support to make it all work. The reason that so many customers have made the IRIS™ choice is that we do it better. When you purchase a new weather radar or upgrade, don't settle for second-best. To get the best product and support, insist on IRIS™.

IRIS™ Applications

- Weather Service Operation – Radar network data processing, communication, operation and management.
- Air Terminal Safety-Microburst & shearline detection & alert.
- Hydrology- Precipitation measurement, flood warning.
- Research- Data processing for advanced applications such as dual-Doppler & polarization.



Microburst warning over VIL for air terminal applications.

Radar status monitoring

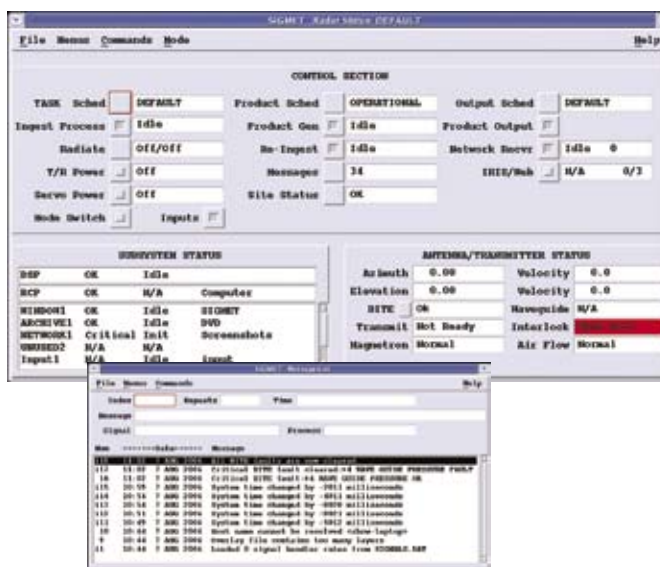
Troubleshooting... no problem with IRIS™

The automated monitoring in IRIS™ functions as a “watchdog” that constantly monitors the health of the system. This frees maintenance personnel from having to make constant checks of the system. Should a problem occur, IRIS™ alerts users, who in turn alert maintenance technicians. The comprehensive system maintenance tools in IRIS™ make it easy for maintenance personnel to isolate and solve the problem.

The *Radar Status Menu* collects all of the hardware and software status, as well as key controls, into a single place— no need to page through several menus to determine the overall health of the system. Since it is an IRIS™ client/server menu, you can connect the *Radar Status Menu* to view any system on the network.

Should a problem occur, the IRIS™ Watchdog process sends an alert pop-up message with an audio “beep” or even a voice synthesis message. The BITE utility is used to configure what parameters are monitored and the severity of the messages. To assist with troubleshooting, faults are logged on disk in the IRIS™ *Message log* so that there is a record even if the system were to lose power.

The **radar status menu** collects all critical status information. Operators can perform nearly all control/monitoring functions from this one menu.



Message log



Fault messages from BITE (BITE examiner utility) are displayed with audio beep or voice synthesis alert.

The **BITE examiner utility** (Bitex) sends alerts to IRIS™ when a fault occurs. Menu fields are all configurable.



IRIS™ data flow & menus

The logic is clear

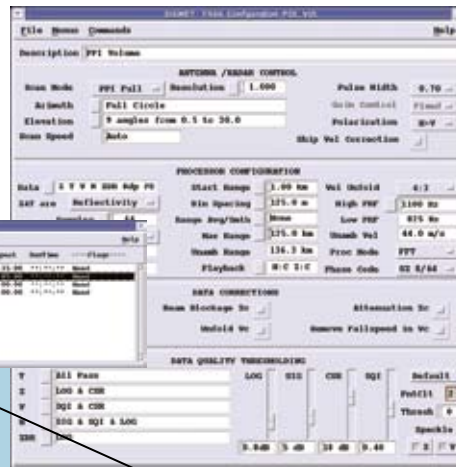
One of the reasons for the success of IRIS™ is the simple, logical software design. The logical structure of IRIS™ makes the software easy for users to understand, and easy for system managers to maintain. At each step, operators have concise interactive menus to monitor and manage the process. These menus make it easy to trace data all the way from the radar receiver to the end user. An entire radar operational plan from scanning to product distribution can be implemented in just a few hours.

Radar process

The radar process provides flexibility for configuring and optimizing complex automatic scanning and signal processing strategies. The *TASK configuration* menu allows operators to take full advantage of the power of Vaisala's RVP8™ digital receiver and signal processor. PPI volume, multi-part hybrid, RHI and even manual scans are supported. The *TASK scheduler* menu is then used to define the mix of TASKS that are active for a scan mode. Networked *real time display* provides instant feedback on the progress

of a scan. You can create and save an unlimited number of schedules for different automatic operational modes. The scanning schedule can even be switched automatically in response to changing weather. This is particularly useful for air terminal wind shear detection.

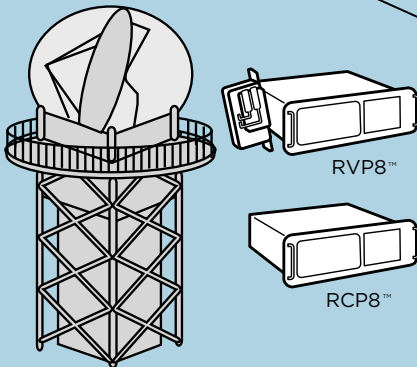
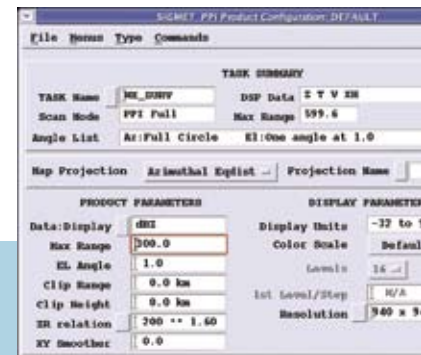
Radar task configuration



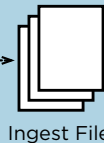
Radar task scheduler



Product configuration



Radar Process



Product Generator Process



Ingest summary



Product scheduler

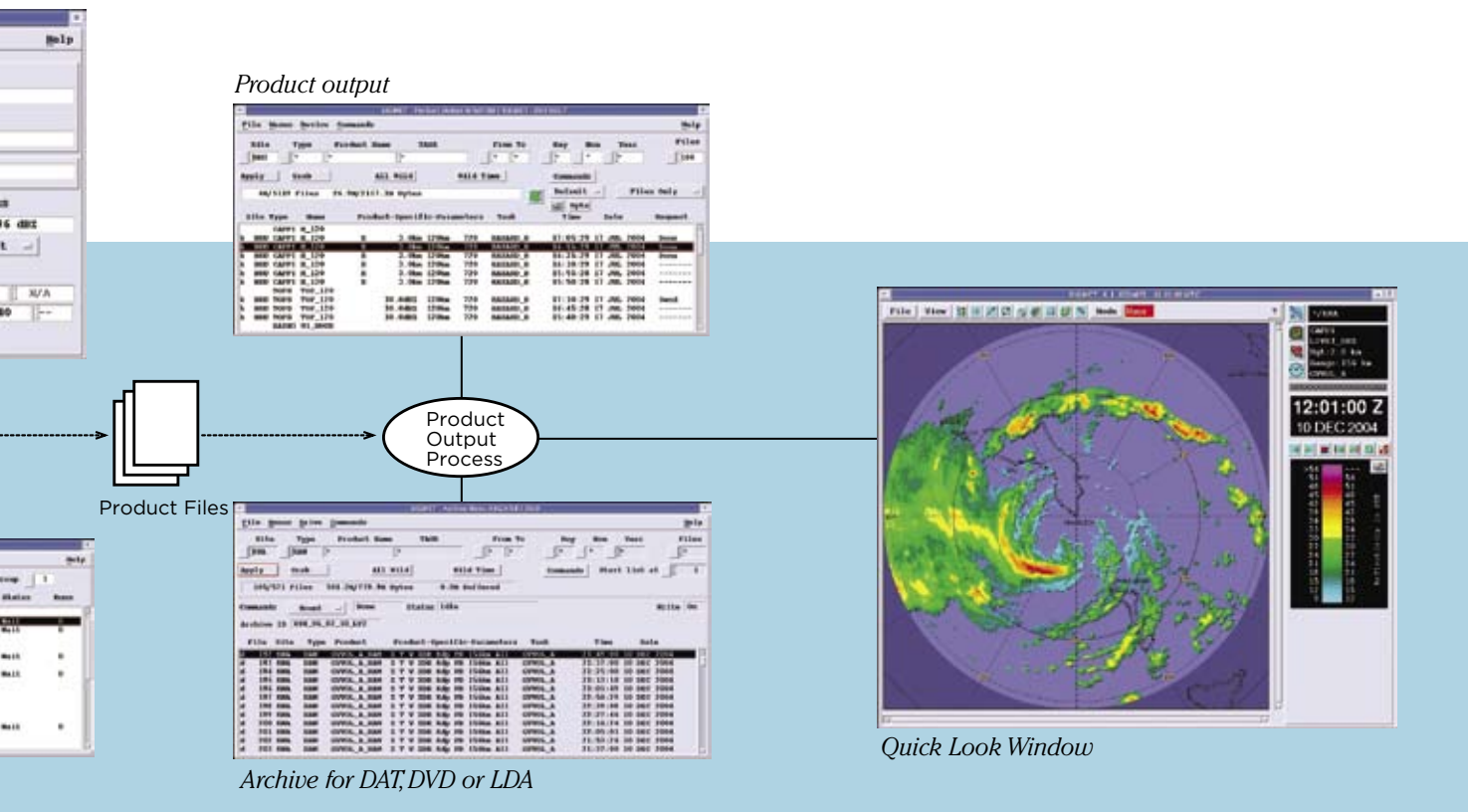
Product generation

The ingest files generated by the radar process are the starting point for the product generator. IRIS™ has the most comprehensive suite of products available in the industry today (see product summary page). The *product configuration* and *product scheduler* menus give operators full control over the details of the product generation and the mix of products for each operational mode. All products are made in the original polar coordinates of the radar data with correction for earth curvature and full interpolation. Resolution and map projection are selectable.

Product output/display

IRIS™ supports automatic or interactive output to a variety of devices. The Quick Look Window, which is a 4th generation graphical user interface design, is forecaster-tested and proven to be easy-to-use with minimal training. Features such as geographic cursor, home points, interactive cross-section, forecast projection and track/annotation make the *Quick Look Window* a powerful tool for forecasters and analysts. What's more, the *Quick Look Window* can be exported over the network to any workstation that is running X- even PC's running Windows or NT.

IRIS™ supports archive/playback on DAT, DVD, as well as multi-GB hard disk archive. System managers can take advantage of output to other networked systems in a variety of formats including IRIS™ Native, JPEG, GIF, TIF, BMP and PostScript. Color postScript printers are supported. These formats make it easy to have automatic updates for web pages or other external applications.



Network management

IRIS™ is the network... IRISnet makes it work!

From software installation to remote control and monitoring, IRIS™ provides logical, easy-to-use tools for secure “single-seat” radar network management. The *IRISnet* tool is the top-level management tool.

Color coded icons display radar and analysis sites and show status at a glance. Operators can point and click to access the IRIS™ tools for any site for configuration and management. Open the utilities menu to perform radar test and calibration. The IRIS™ menus can be “connected” to any

IRIS™ server node to control radar scanning, product generation and output. The advantage to customers is that an entire network can be managed from a central site to eliminate costly travel time.

All **documentation** is on-line.



IRIS™ menus can be connected to any node.



The *IRISnet Network management tool* lets you see at a glance the status of all radar & display systems. Operators can travel the network with a few clicks of their mouse.



The *IRIS™ tools* provide easy access to the most commonly used operator tasks.

Systems maintenance and test

It doesn't get easier than with **IRIS™** utilities!

Modern doppler radars are complex systems. That's why it is essential to have software that simplifies system calibration, alignment and testing. The **IRIS™ utilities** are the answer.

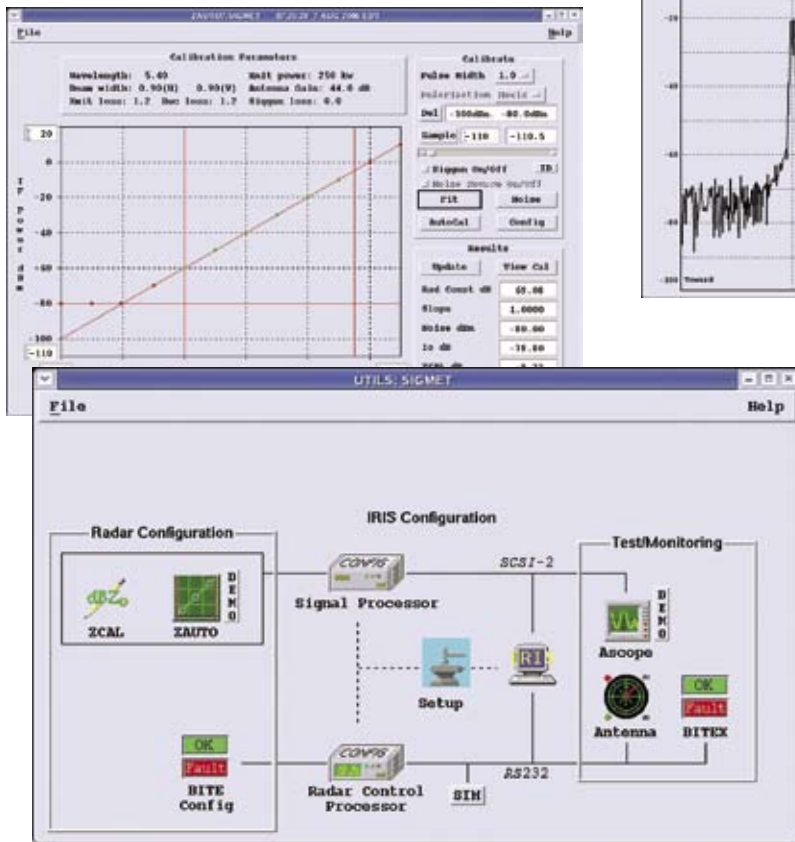
The **IRIS™ utilities** access menu, drawn as a logical block diagram of the system, is your gateway to the IRIS radar utilities. Click on **ZAUTO**

for automatic calibration or **SETUP** for configuration. You can even click on the RVP8™ signal processor icon to access internal EEROM setup or even monitor 30 MHz IF signals- over the network! **ANTENNA** provides completely independent radar and antenna control or sun tracking.

The **ASCOPE** utility is Vaisala's acclaimed signal processor support utility that provides complete control

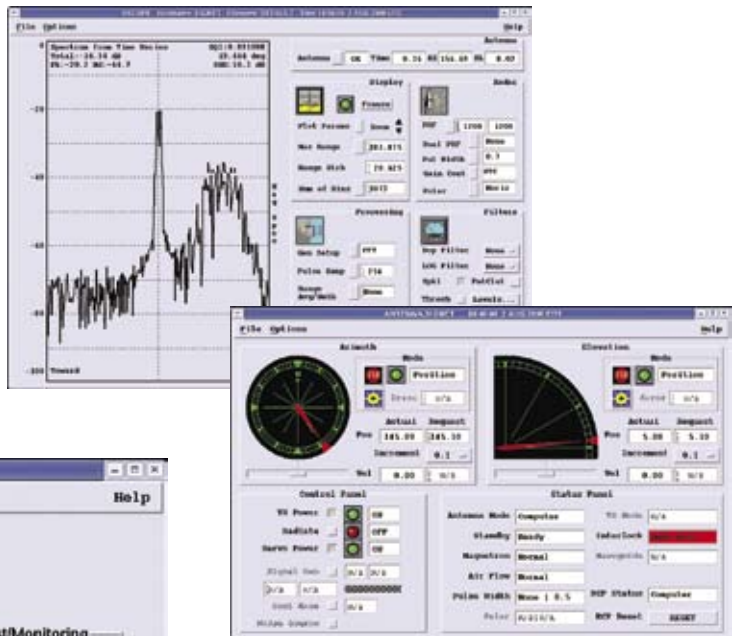
and plotting for all signal processor parameters. Advanced features include FFT, random phase and data recording and playback of any data- even I and Q. The built-in signal simulator provides the ability to test signal processor configurations and algorithms on "real-world" signals.

ZAUTO- Automatic or manual calibration.



Click on the icons in the **utilities menu** to access all the configuration, calibration, & alignment features of **IRIS™**. All of this power can be used over the network from one central maintenance site.

ASCOPE- A comprehensive plotting utility.



Antenna utility- Stand-alone radar/antenna control, test, & monitoring.



SETUP- Based on the logical structure of **IRIS™**.

Vaisala IRIS™ configuration

Standard hardware makes it easy

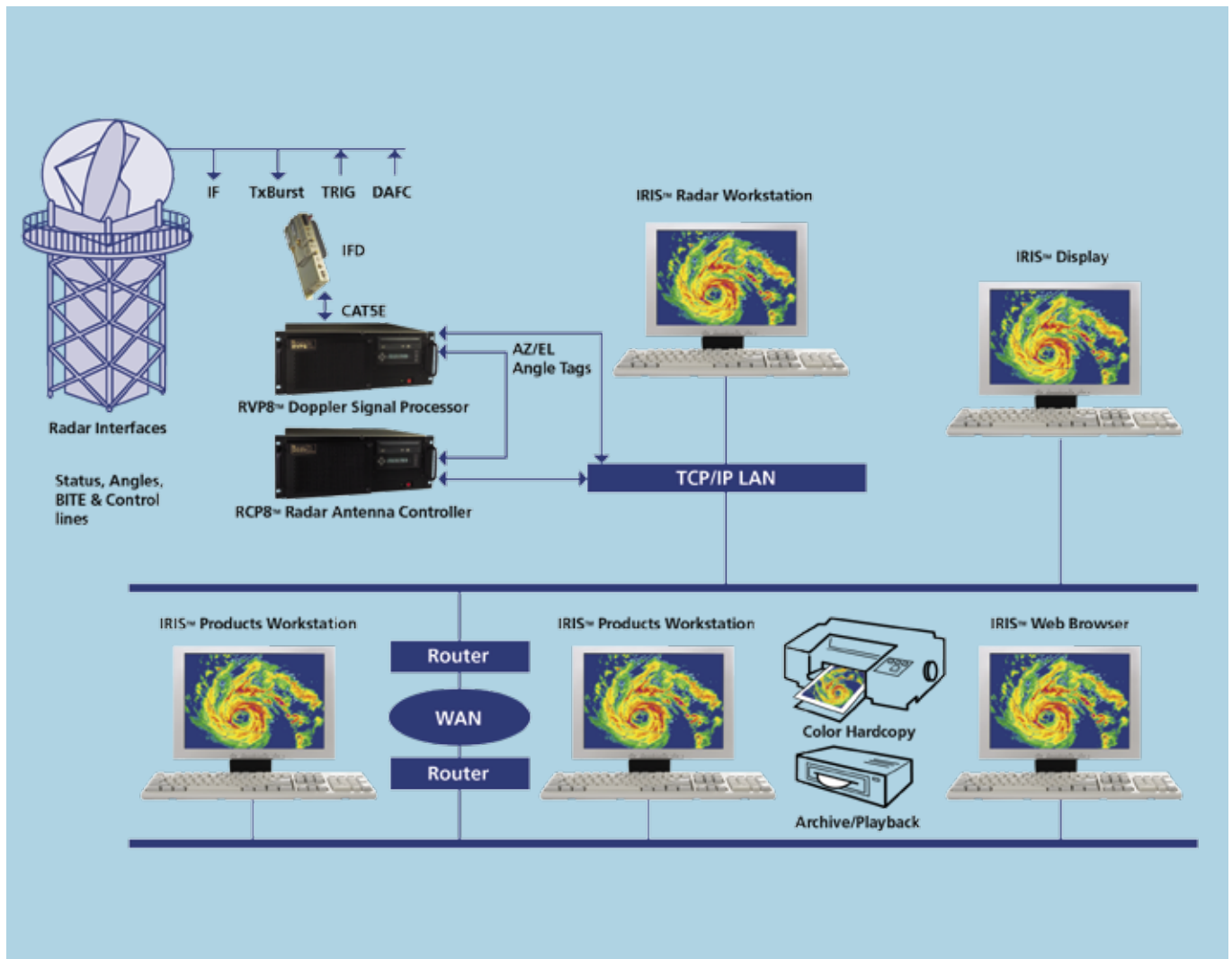
IRIS™ runs on a standard PC running Redhat Linux.

The signal processor and radar control processor (RCP) connect

the workstation to the radar. For the signal processor and digital receiver, the RVP8™ provides a state of the art system based on a standard PCI architecture under the Linux operating system. The RCP can be provided by the radar manufacturer, or you

can select Vaisala's flexible RCP8™ radar/antenna controller.

IRIS configuration examples



IRIS™ key features



- Scalable expandable architecture-IRIS™ can work with a single radar or a network of radars.
- Fully automatic operation or convenient manual operation.
- Single-seat network administration, testing, upgrade and maintenance- no need to go to the radar.
- Comprehensive suite of IRIS™ utilities for system maintenance, calibration and verification.
- Local and remote control with automatic fault alerts and message logging.
- Networked real-time display.
- Graphical utilities such as IRISnet for easy radar and network monitoring and maintenance.
- Built-in simulators for testing and training.
- Automatic operational mode switching in response to changing weather conditions.
- Comprehensive suite of output products based on volume scanning and single sweep.
- Composite for networked radars into selectable projections and “virtual” radar sites.
- Efficient client-server network communications and scalable data communications with data compression.
- Standard TCP/IP networking approach- no custom communication protocols.
- Support for a wide variety of standards-based peripherals such as PostScript printers, DAT tape drives and DVDs.
- Open software with fully documented data formats, automatic format conversion pipes, and source code templates.
- Optional 3D display shows the “big picture”.
- Optional satellite integration support for combined radar and satellite.
- Optional Real-time dual-Doppler.
- Seamlessly reads all older IRIS™ data files.

Technical data

IRIS™ Products (Ø FULL SET / Δ BASIC SET)

BEAM ØΔ

Display of dBZ,V or W in AZ/EL space. Useful for beam pattern measurement.

FCAST ØΔ

Array of displacement and intensity change vectors used for projecting echoes forward in time in the Quick Look Window.

PPI ØΔ

Classical radar display at single elevation for dBZ,V,W.

IMAGE ØΔ

Based on the GIF format. Used for importing data. In particular it is used for renderings from the optional IRIS/3D package.

RAW ØΔ

Compressed polar data with “housekeeping”. Used for data transmission (sweep-by-sweep) and archiving (full volume).

RHI ØΔ

Range-height indicator for “nodding” antenna scanning.

RTI ØΔ

Range-time indicator.

USER ØΔ

An arbitrary format product that is created outside of IRIS™. Used for input of satellite underlays.

WARN ØΔ

Centroid detection with warning message for “hit” protected areas. Generates “pop-up” message with selectable beep/voice synthesis. Can be displayed as colored “centroid” ellipses or overlaid on other products. Used for making alerts for microburst, hail, flood, lightning hazard, severe storm, etc.

TRACK ØΔ

Automatic tracking of centroids with forecasting. Alerts similar to WARN with the addition of forecast alerts for protected areas.

XSECT ØΔ

Cross-section through arbitrary line for dBZ,V,W.

BASE Ø

Echo base height for a selectable dBZ contour.

CAPPI Ø

Constant altitude PPI of dBZ,V,W. Selectable as single-level or 3D multi-level in true or pseudo CAPPI.

DWELL Ø

Time dwell of input product, e.g., a dwell of dBZ PPI's shows tracks as streaks. The effect is similar to opening the shutter of a camera observing a moving object.

HMAX Ø

The height of the maximum dBZ.

MAX Ø

The maximum detected reflectivity over each pixel. Includes E-W and N-S profiles of the maximum in side panel displays.

RAIN1 Ø

Hourly rainfall accumulation based on low-level pseudo CAPPI or SRI input with selectable Z-R relationship. 15- and 30-minute periods also.

RAINN Ø

Arbitrary N-hour rainfall accumulation derived from summing the RAIN1 hourly products.

SRI Ø

Surface rainfall intensity with bright band and profile correction. Output is for a selected reference height or follows digital terrain map.

TOPS Ø

Height of a selectable dBZ contour.

VIL Ø

Vertically integrated liquid (or layer average reflectivity) for a selectable top and bottom layer and Z-W relationship.

VVP Ø

Velocity volume processing wind profile including, wind speed, direction, divergence, deformation, axis of dilatation, particle vertical velocities and reflectivity versus height. Display is either time-height cross-section or graphs.

WIND Ø

Based on the uniform wind assumption and the VVP, this product shows estimated winds for a selected layer of the atmosphere. Display is wind bars that can be overlaid on other products.

Optional Products

CATCH

N-Hour Precipitation totals in subcatchment areas based on RAIN1 product. Histogram pop-up display.

GAGE

Raingage data display with histogram pop-up.

COMP

Compositing of products from multiple radars in a selectable projection. This is usually done at a central site with distribution back out to forecast sites. Products available for composite include BASE, CAPPI, HMAX, PPI, RAIN1, SHEAR, SRI, TOPS, USER, VIL, and WARN.

NDOP

Dual-Doppler wind fields based on radial wind inputs from two Doppler radars.

SHEAR

Radial, azimuthal or elevational shear (separately or any combination). Used for microburst and mesocyclone detection.

SLINE

For detection and forecasting of wind shear lines. Includes automatic warning for hits or forecast hits on protected areas.

IRIS/3D

Manual and/or automatic 3D rendering of multi-level CAPPI cube data with image zoom, tilt and rotate. 3D rendering done in separate 3D engine workstation and 2D IMAGE versions sent back to IRIS™.

IRIS/SATELLITE

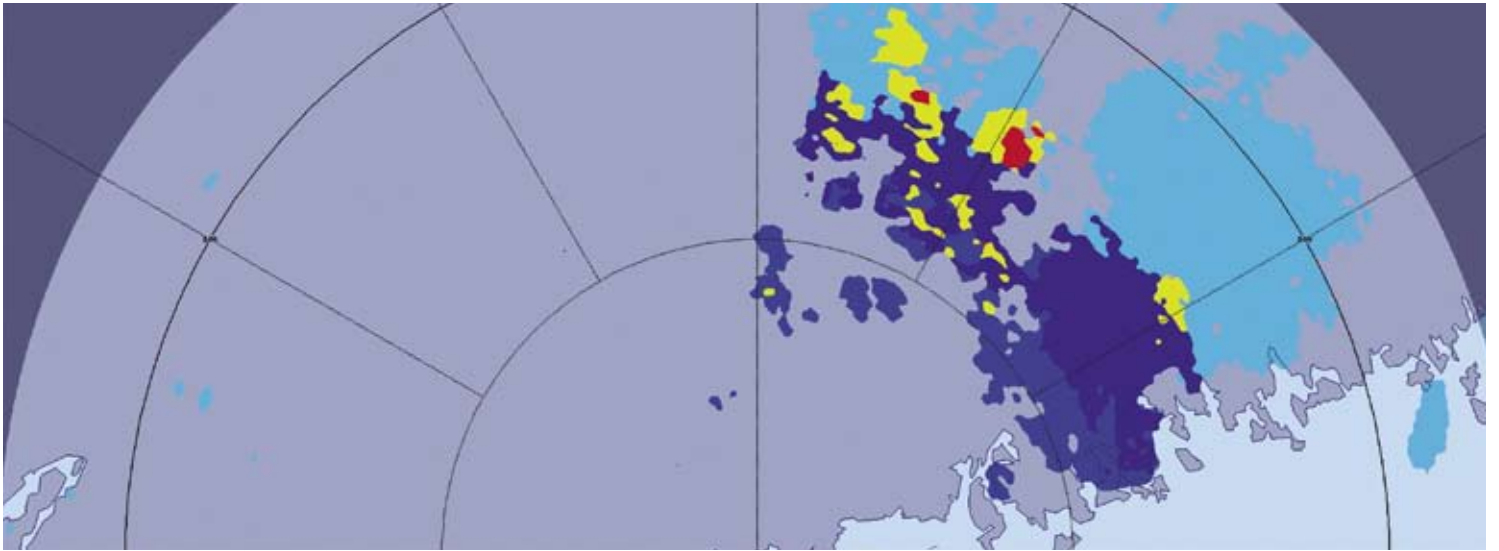
Satellite underlays imported as USER products. Radar data can be overlaid on top. Currently Vaisala supports MCIDAS format images.

HYDROCLASS

Hydrometeor particle identification and non-meteorological data classification using the measurands of a dual-polarized radar.

IRIS/LIGHTING

Real-time ingesting and display of UALF flash lightning data with polarity, cloud-to-cloud, cloud-to-ground, and peak current information. The lighting information can be overlaid with other IRIS products within the IRIS™ Quick Look Window.



VAISALA

www.vaisala.com

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