

## 8.8 IRIS PRODUCT Setups

### 8.8.1 Product Generation

- *Products from partial INGEST scans* — Enter “yes” or “no” to indicate whether products can be made from partial INGEST volume scans.
- *Default Z/R relationship constant/exponent* — The system uses the following equation to express the relationship between reflectivity and rainfall rate:

$$Z = aR^b$$

where:

**Z** is the linear reflectivity.  
**R** is the rainfall rate in mm/hr.  
**a** (relationship constant) and  
**b** (relationship exponent) are empirically determined for each site.

IRIS most often solves for R to convert the radar’s reflectivity data to rainfall rate, as follows:

$$R = \left( \frac{Z}{a} \right)^{\frac{1}{b}}$$

Typical values for rain are  $a = 200$  and  $b = 1.6$ . Using these values, suppose reflectivity is measured at 20 dBZ. To solve for R, IRIS first converts dBZ to Z:

$$20\text{dBZ} = 10 \log_{10} Z \therefore Z = 100$$

Then solve for R:

$$R = \left( \frac{100}{200} \right)^{.63} = .65 \text{ mm/hr}$$

An increase in dBZ, from 20 to 50 for example, creates an increase in rainfall rate:

$$50\text{dBZ} = 10 \log_{10} Z \therefore Z = 100000 \qquad R = \left( \frac{100000}{200} \right)^{.63} = 50 \text{ mm/hr}$$

The values you enter for the constant and exponent depend on the climate at the radar site and experience gathered through use of the IRIS system.

|                                   |                                   |               |
|-----------------------------------|-----------------------------------|---------------|
| Product arrival wait time         | <input type="button" value="i"/>  | 6.0 minutes   |
| Raingage data arrival wait time   | <input type="button" value="i"/>  | 6.0 minutes   |
| Alternating polarization features | <input type="checkbox"/> Disabled |               |
| Read cache size                   | <input type="button" value="i"/>  | 0.0 megabytes |
| Zero reference height             | <input type="button" value="i"/>  | 0 meters      |

- *Product arrival wait time* — This is in effect a scheduling timeout for products which require several inputs, but which can run when some are missing. Products which use this are: COMP, NDOP (with 3 inputs), and RAIN1. For example: suppose a composite product requires 3 radar site inputs within 5 minutes. It gets two of those inputs, then the 5 minute interval expires. If the *Product arrival wait time* is set to 1 minute, then it will wait for 1 more minute before running. This time is meant to cover possible time differences between the radars and differing network transfer speeds.
- *Raingage data arrival wait time* — The time to wait for raingage data to arrive is set separately. This is used in the rainfall correction of the RAIN1 product.
- *Alternating polarization features* — This question will enable the listing of the data types ZDR and KDP, and also the listing of the K/R relationship in many of the menus. It also enables the following questions on the K/R relationship below:
- *Default K/R relationship* — These number allow control over the default KDP–R relationship, similar to the Z–R relationship above.
- *Read Cache size* — The IRIS memory mapped I/O library routines support caching file read. It only operates for reading files. Making this size nonzero disables memory mapping and uses the specified cache size in the product generator.

If your system supports memory mapped I/O, then you may want to keep the caching size at zero. If you do not have memory mapped I/O, then benefits can result by setting the cache size to the approximate size of the INGEST volume scans that are being processed. However, if there is not enough main memory to hold these cached data, then the product generator is swapped to disk and no performance benefit are achieved.

- *Zero Reference Height* — Enter the height in meters above MSL used for zero in the product generator. Generally this should be zero for mean sea level, but for radars far inland, you might want a different reference. All radars to be

composited together should have an agreed upon reference. All heights displayed with the user cursor are relative to this reference.

## 8.8.2 Reflectivity Profile and Wind

| Reflectivity Profile and Wind |   | Help |
|-------------------------------|---|------|
| Use Gradient in CAPPI & XSECT | <input checked="" type="checkbox"/> Yes     |      |
| Gradient Above Melting        | i 7.0 dB/km                                 |      |
| Gradient Below Melting        | i 1.0 dB/km                                 |      |
| Melting Layer Thickness       | i 1.00 km                                   |      |
| Melting Layer Intensity       | i 7.0 dB                                    |      |
| Default Wind                  | <input checked="" type="checkbox"/> Enabled |      |
| Default Wind Direction        | 270 deg.                                    |      |
| Default Wind Speed            | 1.0 m/s                                     |      |

- *Use Gradient in CAPPI & XSECT* — This enables a vertical gradient extrapolation in product generation for the CAPPI and XSECT products. This smooths out the top of the products using the “Gradient Above Melting” from the reflectivity profile. This is the minimum value used when a lower sweep has valid data and the upper sweep is below threshold.
- *Reflectivity profile*: The reflectivity profile consists of a gradient above the melting level, a gradient below the melting level, a melting layer thickness, and a melting layer intensity. The melting layer height, specified elsewhere, is the intersection of the two gradients, and the top of the bright band. These numbers are used in the SRI product profile correction, and in the CAPPI and XSECT smoothing. These numbers can be changed while IRIS is running.
- *Default Wind* — The default wind is recorded with the ingest data and can be used for adjustments to the bird detection algorithm. To use this feature you will need to automatically detect the wind speeds and enter them into the radar system.

### 8.8.3 Status Products

| Status Products                |  | Help |
|--------------------------------|--|------|
| STATUS product generation      | <input checked="" type="checkbox"/> Enabled  |      |
| Time between status products   | <input type="button" value="i"/> 5.0 minutes |      |
| Make product for each task     | <input checked="" type="checkbox"/> Yes      |      |
| STATUS Prod maximum file count | <input type="button" value="i"/> 10 files    |      |
| STATUS product receive timeout | <input type="checkbox"/> Disabled            |      |

- *Status product generation* — Select either “disabled” or “enabled.” If “enabled” is selected, a box appears where you can enter how frequently you want to generate Status products (in minutes), or 0 if you do not want to generate these products. If enabled, IRIS also generates Status products whenever the overall system status changes from OK to Fault, or vice versa.
- *Make product for each task* — This tells IRIS to make a new status product each time a task is started. This is useful if you wish to do status product task slaving.
- *Status Prod maximum file count* — Enter the number of Status product files to be kept on the system.
- *STATUS product receive timeout* — Select either “disabled” or “enabled.” If it is enabled, set this time slightly longer than the time between status products. The default value is 11 minutes with products mode ever 10 minutes.

This feature lets IRIS detect failures of other networked systems. If it has been more than the specified time since a status product has arrived from another system, it will be marked as “Timeout” on the Network Status Display.

## 8.8.4 Product Transmission and Display

| <i>Product Transmission and Display</i> |          | <i>Help</i>  |
|---|----------|--------------|
| WARN max time difference                | <b>i</b> | 15.0 minutes |
| TRACK max time difference               | <b>i</b> | 0.50 hours   |
| FCAST max time difference               | <b>i</b> | 15.0 minutes |
| Default max time difference             | <b>i</b> | 15.0 minutes |
| Maximum files queued for send           | <b>i</b> | 3 files      |
| Controlled value label                  |          | Maximum      |

- *WARNING max time difference* — IRIS allows the automatic display of a warning overlay on top of any PPI or earth projection product. When the product is displayed, the WARN product with the nearest time is overlaid. However, if the time difference exceeds this value, it is not overlaid. The recommended value is 15 minutes. A value of 0 disables the check.
- *TRACK max time difference* — If the time difference between the most recent point in the Track product and the data time of the image exceed this limit, then the overlay is not drawn. A value of 0 disables the check.
- *FCAST max time difference* — Similar for forecast products.
- *Default max time difference* — Similar for all other product types.
- *Maximum files queued for send* — Enter the maximum files that IRIS will queue for sending to a network output device. For example, in the event of a network failure, IRIS will queue files to send. When the link is restored all of the queued files will be sent (from oldest to most recent). The receiving machine will then have to “catch-up” by processing all of the data. For critical real time applications, the number of backlog files in the queue should be kept small (e.g., 2 or 3) so that real time operation will resume quickly. For a system where the data archive is important, then set the number to be large, e.g., to 50 or to 0 to disable the feature. This limit applies only to network devices.

|                               |   |
|-------------------------------|---|
| Maximum files queued for send | 1   |
| Centroid value label          | Maximum <input type="checkbox"/>            |
| Centroid overlay fill style   | Hatched <input type="checkbox"/>            |
| Label bottom of SLINE display | <input checked="" type="checkbox"/> Enabled |
| Label bottom of TDWR display  | <input checked="" type="checkbox"/> Enabled |
| Label bottom of TRACK display | <input checked="" type="checkbox"/> Enabled |
| Label bottom of WARN display  | <input checked="" type="checkbox"/> Enabled |

- *Centroid value label* — Centroids of the WARN product can be optionally labelled on display. There are three choices: None, maximum, and average. SIGMET suggests using the average value.
- *Centroid overlay fill style* — Centroids of the WARN product are drawn as a filled ellipse using a special color. When drawn as an overlay on top of other products, you can select here whether the ellipse is filled, hatched, or open.

All the warning generating products can show the warning message on the bottom of the display window. Use these buttons to enable that feature, if desired.

### 8.8.5 Product Scheduling Priority

|                           |          |             |
|---------------------------|----------|-------------|
| <b>Product Scheduling</b> |          | <b>Help</b> |
| BEAM Product Priority     | <b>i</b> | 20          |
| CAPPI Product Priority    | <b>i</b> | 20          |
| CATCH Product Priority    | <b>i</b> | 20          |
| COMP Product Priority     | <b>i</b> | 20          |

Define the relative priorities for each product type. These numbers range from 0 (lowest priority) to 100 (highest priority). The Product Generator sorts the full schedule of products and determines the next product to run according to the following hierarchy:

1. User-defined product priority. All products of a given priority run in favor of products of a lower priority.
2. Oldest data time. Within a given priority, the product that runs on the oldest input data is scheduled before any others.
3. Order within the schedule, from top to bottom.

A typical schedule might set XSECT products to priority 30, WARN products to priority 40, and all others to priority 20. However, the needs of an individual site might require different settings. For example, a site that must output raw data quickly would increase the priority of RAW products or decrease the priority of products considered “background.”

### 8.8.6 Warning Regions

| <i>Warning Region #1</i>  |   | <i>Help</i> |
|---------------------------|---|-------------|
| Name                      | <input type="text" value="areal"/>        |             |
| Center East of the radar  | <input type="text" value="0.000 km"/>     |             |
| Center North of the radar | <input type="text" value="0.000 km"/>     |             |
| Width East-West           | <input type="text" value="50.000 km"/>    |             |
| Height North-South        | <input type="text" value="50.000 km"/>    |             |
| Orientation               | <input type="text" value="0.00 degrees"/> |             |

The IRIS warning product allows the selection of up to 32 protected areas. If the warning results fall into one of the selected protected areas, a signal is sent to all the IRIS terminals.

Each protected area consists of a rectangle. The location, size, and orientation can be selected. If the area you wish to protect is of an irregular shape, it can be pieced together with several areas.

- *Name* — Enter a name for the region. The name can be up to 12 characters long. If the name is blank, then the region is undefined and disabled, and Setup does not ask the remaining questions if the name is blank.
- *Center east/north of radar* — Enter the location of the center of the protected region in kilometers relative to the radar. West and south are entered as negative numbers.

- *Width east-west/north-south* — Enter the width and length of the region in kilometers. These numbers cannot be negative.
- *Orientation* — The region specified with the previous questions can be rotated by up to 45 degrees in either a clockwise or counterclockwise direction. Enter a positive number for clockwise rotation, a negative number for counterclockwise rotation.