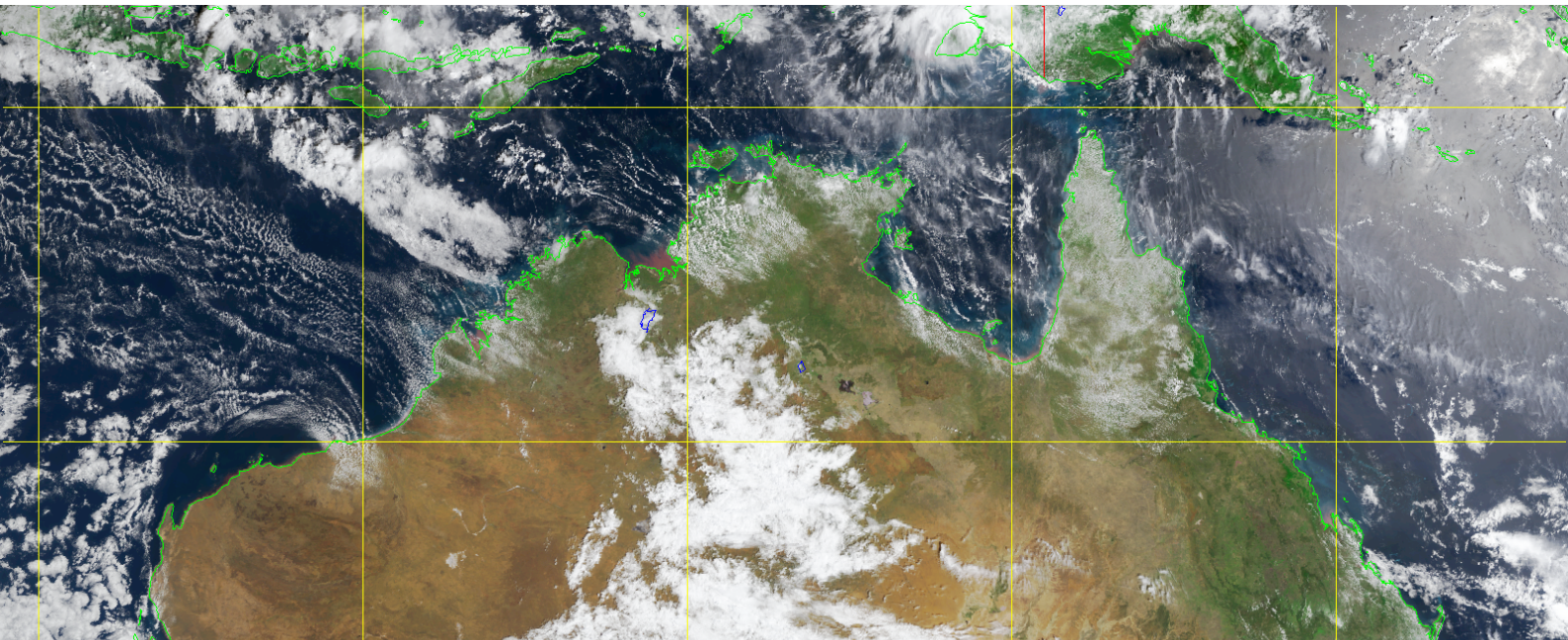




HIMAWARICAST SYSTEM



SOFTWARE QUICK START GUIDE

Dartcom HimawariCast system

Software quick start guide

1st edition, revision 4 (March 2025)
Copyright © 2023–2025 Dartcom Systems Ltd



**Dartcom, Powdermills, Postbridge,
Yelverton, Devon, PL20 6SP, UK**

**Phone (01822) 880253
International +44 1822 880253**

support@dartcom.co.uk • <https://www.dartcom.co.uk>

Contents

1 Introduction

Overview	1-1
----------------	-----

2 Configuring the software

Introduction	2-1
iDAP	2-1
MacroPro	2-3
Geostationary Ingester	2-3
Summary	2-6

3 Using the software

Introduction	3-1
About the software.....	3-1
Tutorials.....	3-2
Tutorial 1: Setting up an iDAP image output	3-2
Tutorial 2: Opening an iDAP image.....	3-6
Tutorial 3: Creating an animation	3-7
Tutorial 4: Reprojecting an image	3-12
Tutorial 5: Creating a palette product.....	3-14
Tutorial 6: Masking a palette product	3-16
Tutorial 7: Setting up source images for RGB products	3-17
Tutorial 8: Creating an RGB product	3-19
Tutorial 9: Animating an RGB product.....	3-21
Tips	3-22
Geostationary Ingester	3-23
MacroPro.....	3-23
iDAP	3-24
Summary	3-24

Figures

2.1	The Configuration window of the iDAP software	2-2
2.2	The iDAP Configuration window with the Paths tab displayed	2-2
2.3	The HimawariCast HRIT tab of the Geostationary Ingester software	2-3
2.4	The Geostationary Ingester File acquisition tab	2-4
2.5	The Geostationary Ingester Decryption & decompression tab	2-4
2.6	The Geostationary Ingester Output tab	2-5
2.7	The Geostationary Ingester iDAP image settings window	2-5
2.8	The Geostationary Ingester Default overlay settings window	2-6
3.1	The iDAP image output settings window ready to add an output	3-2
3.2	The DK01IR1 product selected and its preview displayed	3-3
3.3	An area selection box drawn around Australia	3-3
3.4	The Overlay settings window with the default overlays	3-4
3.5	The Australia state boundaries overlay added	3-4
3.6	The Australia IR1 output fully set up	3-5
3.7	The Output tab with the Australia IR1 iDAP image output added	3-5
3.8	The Open window with the Australia IR1 image selected	3-6
3.9	The Australia IR1 iDAP image	3-7
3.10	The Automatic processing settings window	3-7
3.11	The Australia folder added to the macro set	3-8
3.12	The Image to process window	3-8
3.13	The Enhance operation switched on and configured	3-9
3.14	The Blue Marble mask operation switched on and configured	3-9
3.15	The Save operation switched on	3-10
3.16	The Animate operation switched on and configured	3-10
3.17	The Open window with the Australia IR1 animation selected	3-11
3.18	The Australia IR1 animation	3-11
3.19	The Reproject operation switched on	3-12
3.20	The Map options manager window	3-12
3.21	The Map options manager window configured for Western Australia	3-13
3.22	The Reproject operation configured for Western Australia	3-14
3.23	The Western Australia IR1 image	3-14
3.24	The Palette product operation configured for land temperature	3-15
3.25	The Western Australia LST product image	3-16
3.26	The DEM mask operation switched on and configured	3-17
3.27	The Western Australia LST product image with DEM mask applied	3-17
3.28	The Australia VIS-B04-B05 iDAP image output set up	3-18
3.29	The Output tab with the RGB product source image outputs added	3-19
3.30	The Airmass folder added to the macro set	3-19
3.31	A new RGB product added to the Airmass folder	3-20
3.32	The Himawari AHI Airmass, Western Australia 2km RGB product added	3-20
3.33	The Himawari AHI Airmass Western Australia 2km image	3-21
3.34	The Himawari AHI Airmass Western Australia 2km animation macro	3-22
3.35	The Himawari AHI Airmass Western Australia 2km animation	3-22

Tables

2.1	Paths to configure in the iDAP software	2-3
-----	---	-----

Introduction

Overview

The Dartcom HimawariCast system is a high-performance, high-reliability solution for ingesting data from the Japan Meteorological Agency (JMA) HimawariCast DVB service. It also provides full display and processing facilities for the resulting images.

The key features of the Dartcom HimawariCast system are:

- Support for all HimawariCast HRIT image data.
- Calibrated temperature read-outs from infra-red and water vapour images and albedo from visible images.
- Fully automatic Windows-based Geostationary Ingester data ingest and archiving software.
- Fully automatic Windows-based MacroPro post-ingest processing and product generation software.
- Powerful, easy-to-use Windows-based iDAP display and processing software.

This manual assumes the system has already been installed and tested by Dartcom or one of its appointed distributors. It provides instructions for configuring the software initially, and a series of tutorials and tips on how to use the software.

Please refer to the separate *Geostationary Ingester software user guide* and *iDAP/MacroPro software user guide* for further information.

2

Configuring the software

Introduction

The software should already have been installed on the host PC by Dartcom or one of its appointed distributors. This section guides you through initial configuration.



Before you start, ensure your Dartcom security device is connected to the host PC otherwise the software will not run.

iDAP

Follow the instructions below to configure the iDAP software.

- ❶ Start the iDAP software from the Windows **Start** menu.
- ❷ Select **Utilities>Configuration....** The **Configuration** window (figure 2.1) is displayed with the **Station** tab selected. In the **Details** area, enter a name and description for your ground station in the **Name** and **Description** boxes respectively. In the **Position** area, switch off **Update automatically**, set **Source** to **Fixed** and enter the latitude and longitude of your station position in the **Latitude** and **Longitude** boxes respectively.

Figure 2.1
The **Configuration** window of the iDAP software

The screenshot shows the 'Configuration' window with the 'Station' tab selected. The window has a title bar with a question mark and a close button. Below the title bar are four tabs: 'Station', 'Appearance', 'Paths', and 'Session'. The 'Station' tab is active, showing several sections: 'Details' with fields for 'Name' (Dartcom), 'Description' (Dartcom ground station), and 'Logo' (with 'Choose...' and 'Reset' buttons); 'Position' with a checked 'Update automatically' checkbox, a 'Source' dropdown set to 'File' with a path 'C:\Users\ChrisWright\AppData\Roaming\Dartcom\Common\GNSS.txt' (and 'Choose...'/'Reset' buttons), and 'Fixed' radio button with 'Latitude' (50.576 °N) and 'Longitude' (3.939 °W) fields; 'Document updating' with an 'Interval' spinner set to 10 seconds, a 'Play a sound when documents are updated' checkbox, and a sound selection area (with 'Choose...'/'Reset' buttons and a play button); and 'Display formats' with dropdowns for 'Position' (ddd.ddd°), 'Time' (Local time when ingested), 'File names' (Local time when ingested), and 'Temperature' (°C). A 'Processing' section on the right has a 'Limit worker threads to:' spinner set to 8, with text indicating 16 available CPU cores. At the bottom are 'Cancel' and 'OK' buttons.

- 3 Click the **Paths** tab (figure 2.2) and ensure the paths are configured correctly. The default settings are shown in table 2.1, or you may wish to set them to other folders if you have particular data storage requirements. Switch off **Lightning database** as lightning data is not available on HimawariCast.

Figure 2.2
The iDAP **Configuration** window with the **Paths** tab displayed

The screenshot shows the 'Configuration' window with the 'Paths' tab selected. The window has the same title bar and tabs as Figure 2.1. The 'Paths' tab is active, showing a list of paths for various data types, each with a 'Choose...' button and a 'Reset' button. The paths are: 'IDAP documents:' (C:\Dartcom\Images), 'Exported data:' (C:\Dartcom\Images), 'Map overlays:' (C:\Program Files (x86)\Dartcom\Map overlays), 'Temporary storage:' (C:\Users\CHRISW~1\AppData\Local\Temp\Dartcom iDAP), 'Lightning database:' (unchecked checkbox, C:\Dartcom\Databases\Lightning.db), 'HRPT archive:' (C:\Dartcom\Data\HRPT\Archive), 'AHRPT archive:' (C:\Dartcom\Data\AHRPT\Archive), 'DMSP archive:' (C:\Dartcom\Data\DMSP\Archive), 'XRIT archive:' (C:\Dartcom\Data\XRIT\Archive), and 'GeoTIFF archive:' (C:\Dartcom\Data\GeoTIFF). At the bottom are 'Cancel' and 'OK' buttons.

Table 2.1

Paths to configure in the iDAP software

Path	Default folder
iDAP documents	C:\Dartcom\Images
Exported data	C:\Dartcom\Images
Map overlays	C:\Program Files (x86)\Dartcom\Map overlays
Temporary storage	(user's temporary folder)\Dartcom iDAP
XRIT archive	C:\Dartcom\Data\XRIT\Archive

- ④ Click **OK** to apply the new configuration.
- ⑤ Ensure **Utilities>Automatic update** is switched on. This causes open documents to be updated with new data automatically.
- ⑥ Ensure **Utilities>Start MacroPro automatically** is switched on. This causes MacroPro to be started automatically each time you open iDAP.

MacroPro

Follow the instructions below to configure the MacroPro software.

- ① Start MacroPro by selecting **Utilities>Start MacroPro...** within iDAP.
- ② By default, MacroPro is configured to minimise itself after opening. Click its icon in the Windows taskbar to restore its window.
- ③ Choose **Utilities>Configuration....** The **Configuration** window (very similar to figure 2.1) is displayed. Click **Synchronise with iDAP** (in the bottom left corner) and click **OK**.

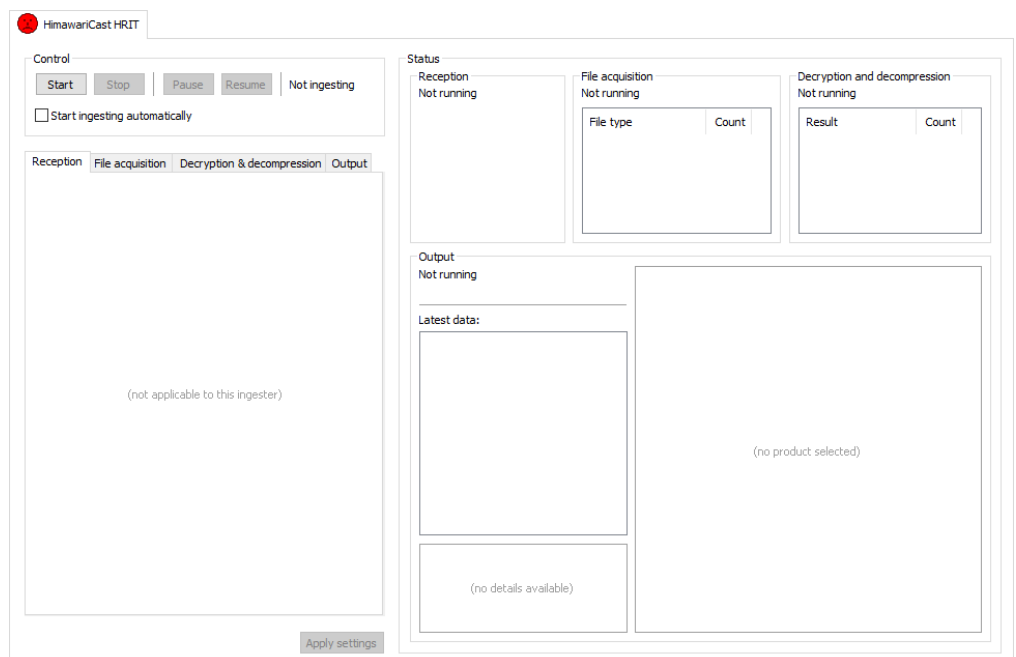
Geostationary Ingester

Follow the instructions below to configure the Geostationary Ingester software.

- ① Start Geostationary Ingester from the Windows **Start** menu.
- ② Click the **HimawariCast HRIT** tab (figure 2.3).

Figure 2.3

The **HimawariCast HRIT** tab of the Geostationary Ingester software



- ③ In the **Control** area, switch on **Start ingesting automatically**.
- ④ In the **File acquisition** tab (figure 2.4) ensure **Acquire files** and **Look for files in** are switched on, and **Archive acquired files** and **Process only these file types** are switched off. Set the **Look for files in** path to the following:

C:\HRIT

Figure 2.4
The Geostationary
Ingester **File**
acquisition tab

Reception File acquisition Decryption & decompression Output

☒ Acquire files

☒ Look for files in:
C:\HRIT Choose...

☐ Archive acquired files in:
C:\Dartcom\Data\XRIT\Raw Choose...

☒ Delete files over 1 hours old

☐ Process only these file types:

☒ Process new file types by default Clear file types

☒ Alarm if maximum time without data exceeded

- ⑤ In the **Decryption & decompression** tab (figure 2.5) ensure **Decrypt and decompress files** is switched on, and **Before decompression, archive files**, **Archive processed files** and **Extract data from files** are switched off.

Figure 2.5
The Geostationary
Ingester **Decryption &**
decompression tab

Reception File acquisition Decryption & decompression Output

☒ Decrypt and decompress files Decryption settings...

☐ Before decompression, archive files in:
C:\Dartcom\Data\XRIT\Compressed Choose...

☒ Delete files over 1 hours old

☐ Archive processed files
Settings for: Image data Use for all

☒ Archive in:
C:\Dartcom\Data\XRIT\Archive Choose...

Group into folders: ☒ By type ☒ By date ☒ By time

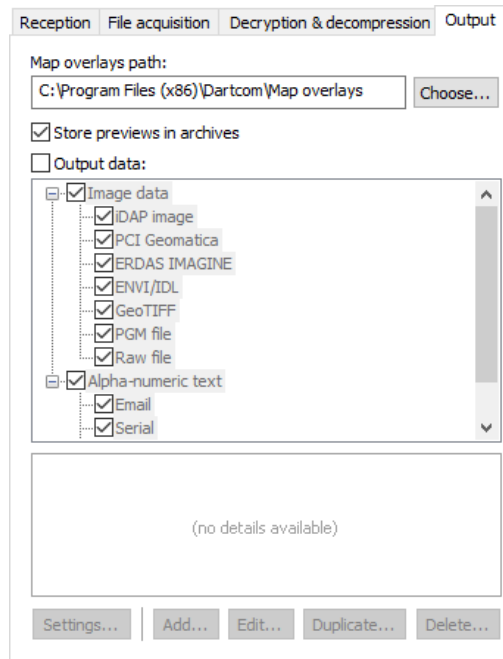
☒ Delete files over 1 days old

☐ Extract data from files and archive in:
C:\Dartcom\Data\XRIT\Extracted Choose...

☐ Delete files over 1 hours old

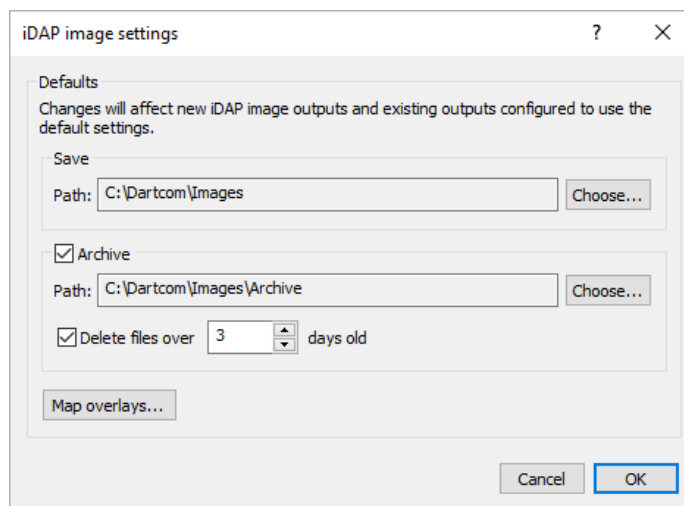
- ⑥ In the **Output** tab (figure 2.6) ensure **Map overlays path** is set to **C:\Program Files (x86)\Dartcom\Map overlays** and **Store previews in archives** is switched on.

Figure 2.6
The Geostationary
Ingester **Output** tab



- ⑦ Switch on **Output data**. In the list below it, under **Image data** right-click **iDAP image** and select **Settings....** The **iDAP image settings** window (figure 2.7) is displayed. In the **Save** area, ensure **Path** is set to **C:\Dartcom\Images** (or your chosen iDAP images folder). If you want to create an archive of iDAP images by default, switch on **Archive**, ensure **Path** is set to **C:\Dartcom\Images\Archive** (or your chosen iDAP images archive folder) and set the number of days you want to keep in the archive.

Figure 2.7
The Geostationary
Ingester **iDAP image
settings** window

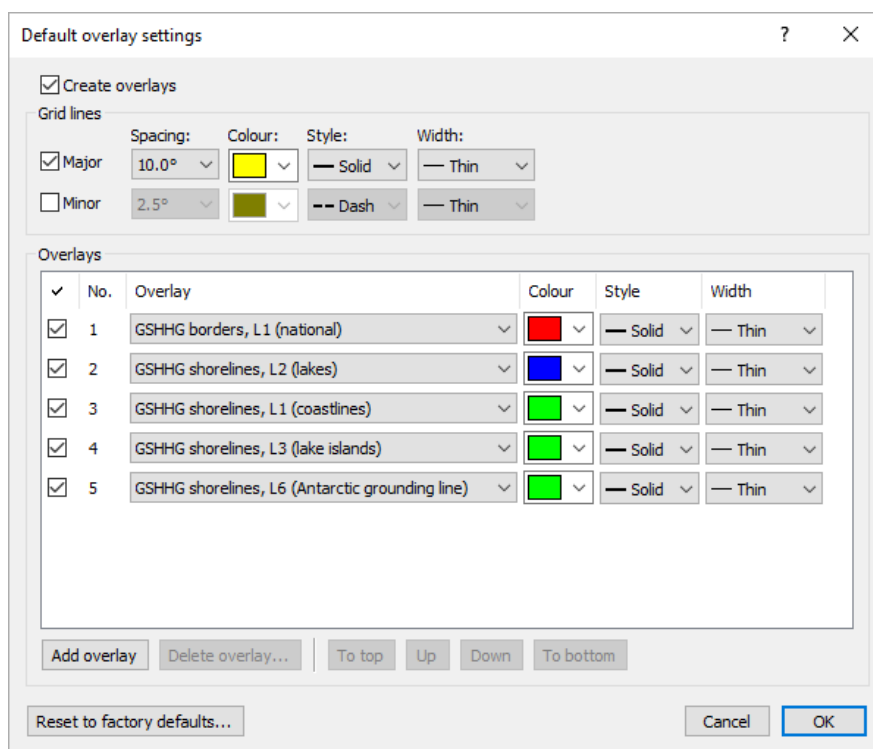


- ⑧ Click **Map overlays...** to display the **Default overlay settings** window (figure 2.8). Ensure **Create overlays** is switched on, then configure the grid lines and overlays as required. The factory defaults are suitable for most purposes, but you may wish to add state boundaries for individual countries, or alter the colours or line styles. Full reference information for this window is provided in the *Dartcom Geostationary Ingester software user guide*.



These overlay settings will be used as the defaults, but they can be customised for individual outputs if required.

Figure 2.8
The Geostationary
Ingester **Default**
overlay settings
window



- 9 Click **OK** when you have finished configuring the default overlay settings, then **OK** again to close the **iDAP image settings** window.
- 10 At the bottom of the **HimawariCast HRIT** tab, click **Apply settings** to make your changes take effect.
- 11 In the **Control** area, click **Start** to commence ingest.
- 12 The **HimawariCast HRIT** tab icon should now be green (●) and spinning to indicate that ingest is in progress.
- 13 Leave the system ingesting data for at least 20 minutes to ensure all available products have been ingested. As new products are received they will appear in the **Latest data** list on the left-hand side of the **Output** area within the **Status** area. Click a product name in the list to view information about it and a preview (if available).

Summary

The software should now be set up and ready to use.

The next section provides a number of tutorials and tips to help you get started using the software. You should also refer to the separate *Geostationary Ingester software user guide* and *iDAP/MacroPro software user guide* for further information.

3

Using the software

Introduction

This section describes each program, then shows how to accomplish common tasks and use the core software functions via tutorials and useful tips.

About the software

The Dartcom HimawariCast software comprises the following programs:

- **Geostationary Ingester** ingests HimawariCast data and **should be left running all the time**. It allows all or part of each product to be output as a Dartcom iDAP image, or other formats for use in third-party image processing software. You will need to set up the outputs to meet your requirements for the geographical area of coverage and range of products. If required, Geostationary Ingester can also maintain archives of products that have been output. However, it does not create iDAP animations, which is one of the tasks performed by MacroPro.
- **MacroPro** is an automatic image processing program and **should be left running all the time**. It is effectively an automated version of iDAP and can be set up to perform a list of operations (a *macro*) on each image output by Geostationary Ingester every time it is updated with the latest data. The processing operations include enhancement, masking, exporting, printing, animation, reprojection and creation of products. MacroPro will not do anything unless you set up macros for the images you want to process.
- **iDAP** (integrated display and processing) allows you to view, process, print and export images output by Geostationary Ingester and processed by MacroPro. You can also play back and edit animations created by MacroPro.

Tutorials

Below are several tutorials designed to show you how to use the core software functions and see some initial results. They are intended to be performed in sequence and therefore follow on from each other.

Having completed the tutorials, we recommend you explore the software further, referring to the separate *Geostationary Ingester software user guide* and *iDAP/MacroPro software user guide*.

Tutorial 1: Setting up an iDAP image output

To be able to view ingested images in iDAP you need to set up outputs in Geostationary Ingester. This tutorial will show how to set up a single plane iDAP image output for an area of the HimawariCast DK01IR1 product which covers Australia.

- ❶ If it is not already running, start Geostationary Ingester from the Windows **Start** menu.
- ❷ Click the **HimawariCast HRIT** tab, then click the **Output** tab.
- ❸ Ensure **Output data**, **Image data** and **iDAP image** are switched on.
- ❹ Under **Image data**, right-click **iDAP image** and select **Add output....** The **iDAP image output settings** window (figure 3.1) is displayed.

Figure 3.1
The **iDAP image output settings** window ready to add an output

- ❺ In this tutorial we will be setting up an output for the 10.4µm infra-red band (IR1) which covers Australia, so enter **Australia IR1** in the **Name** box.
- ❻ In the **Service** drop-list, select **HimawariCast**.
- ❼ In the **Data type** drop-list, select **Image**.

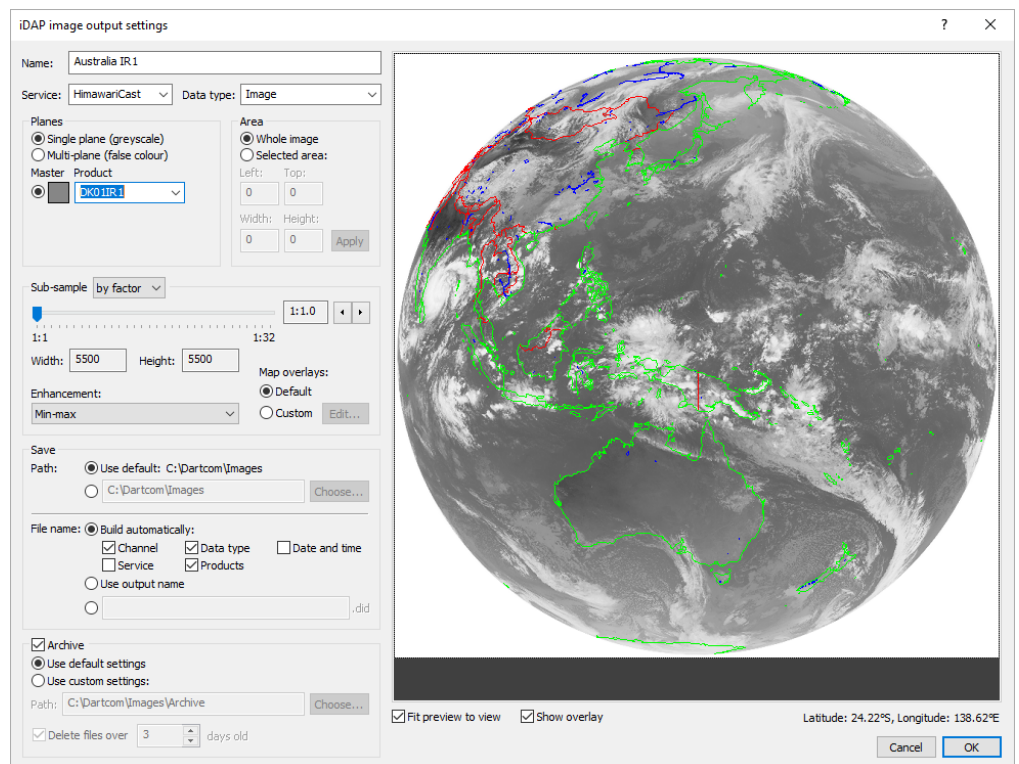


If the above items are not listed, click Cancel, leave the system ingesting data for around 20 minutes, then start this tutorial again.

- 8 In the **Planes** area, select **Single plane (greyscale)**.
- 9 In the **Product** drop-list select **DK01IR1**. A preview is displayed on the right-hand side as shown in figure 3.2.

Figure 3.2

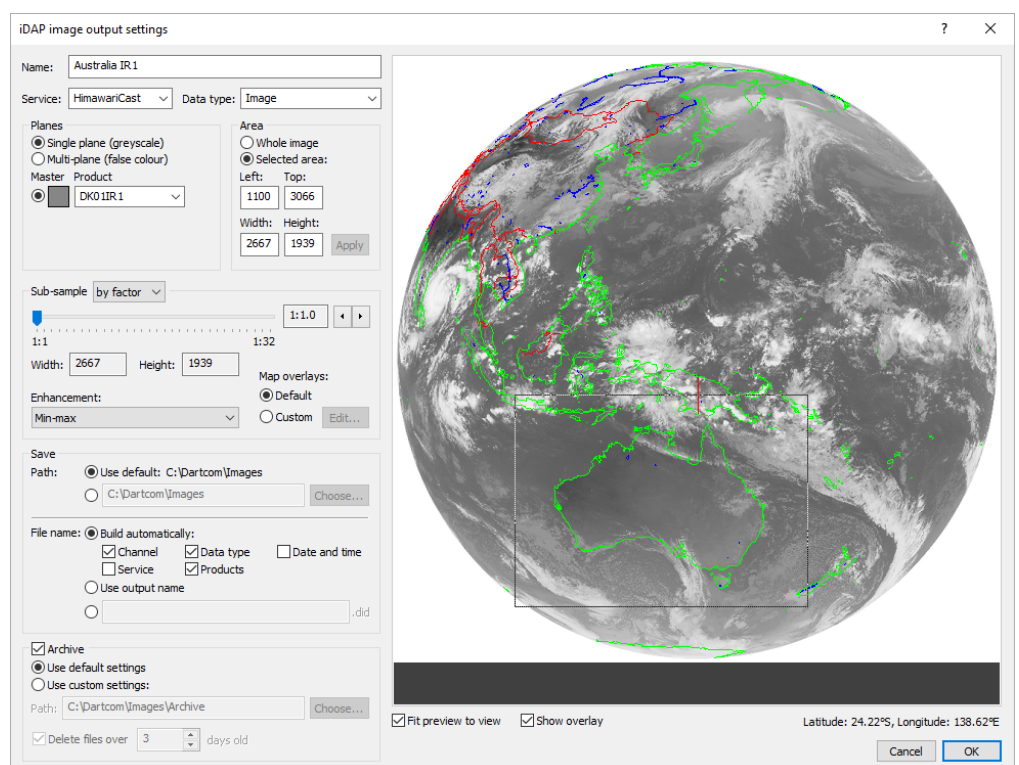
The **DK01IR1** product selected and its preview displayed



- 10 In the **Area** area, click **Selected area**, then draw a rectangular box on the preview which covers Australia, as shown in figure 3.3.

Figure 3.3

An area selection box drawn around Australia

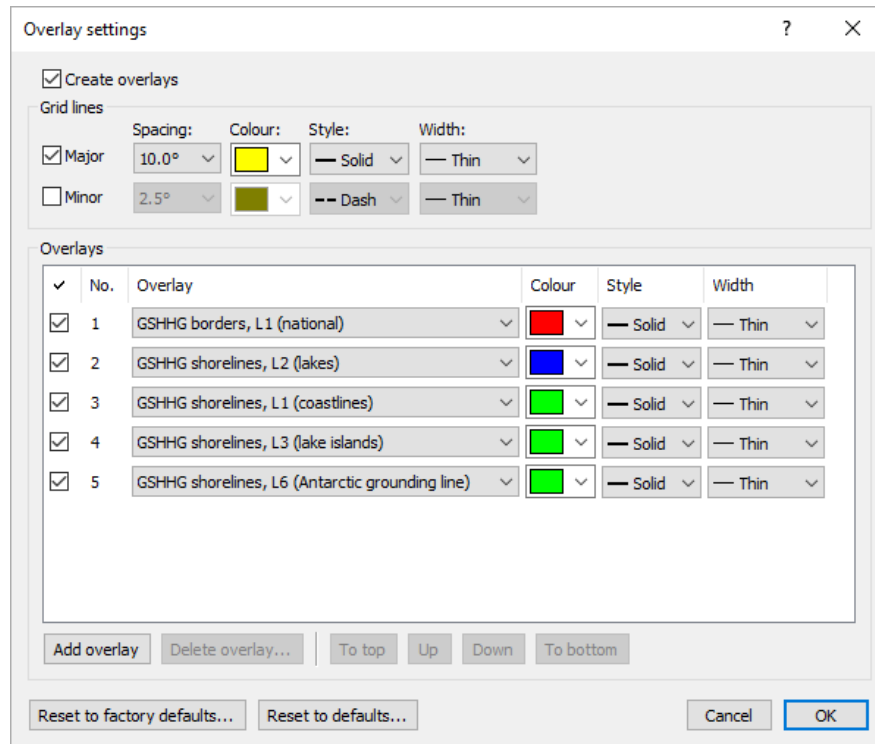


- 11 In the **Sub-sample** area, ensure **by factor** is selected in the drop-list and the slider is set to **1:1**. This will produce a full-resolution image.

- 12 Ensure **Min-max** is selected in the **Enhancement** drop-list.
- 13 Set **Map overlays** to **Custom** and click **Edit...** to display the **Overlay settings** window (figure 3.4).

Figure 3.4

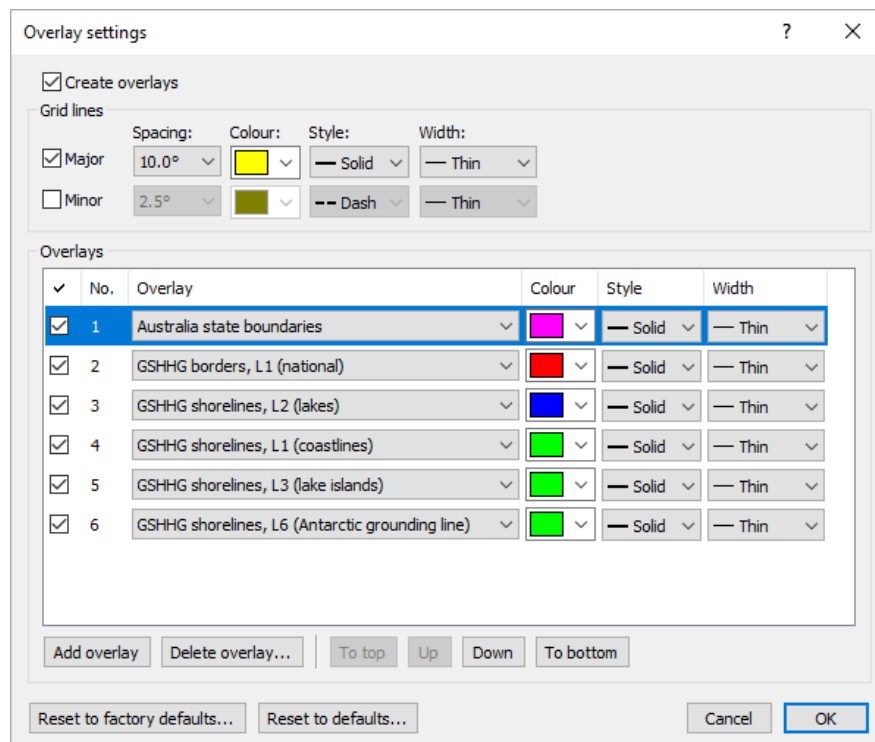
The **Overlay settings** window with the default overlays



- 14 Click **Add overlay**. A new overlay will be added at the top of the **Overlays** list. In the drop-list in the **Overlay** column, select **Australia state boundaries**. Use the picker in the **Colour** column to set the overlay's colour to magenta. The window should now resemble figure 3.5.

Figure 3.5

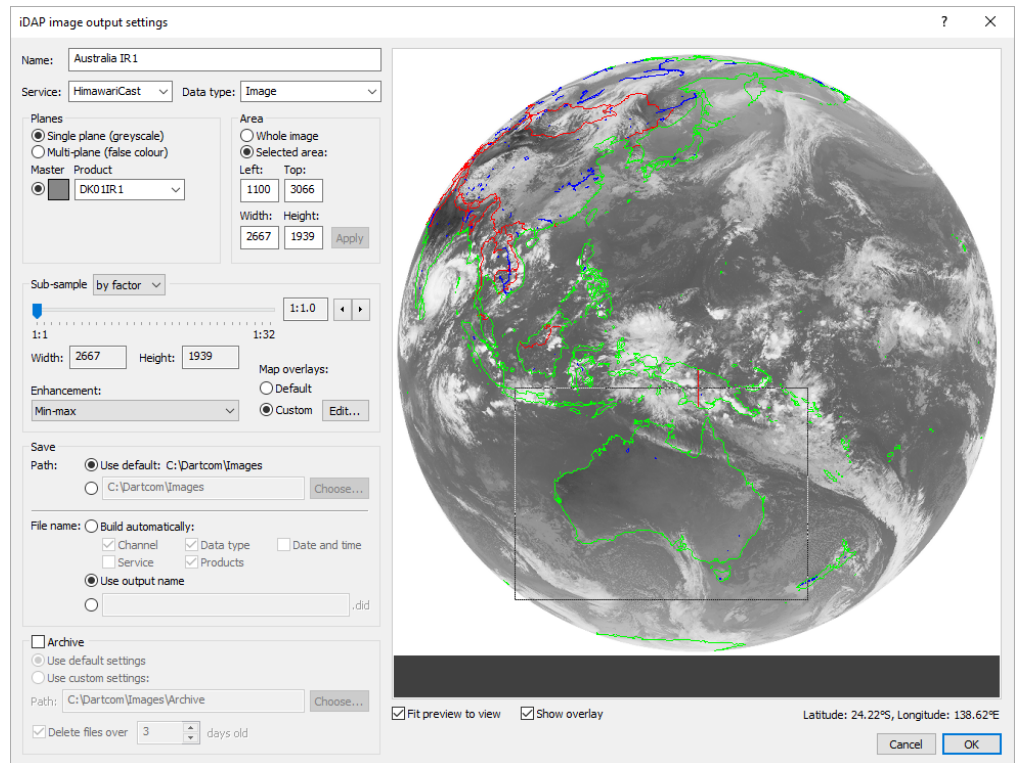
The **Australia state boundaries** overlay added



- 15 Click **OK** to close the **Overlay settings** window.

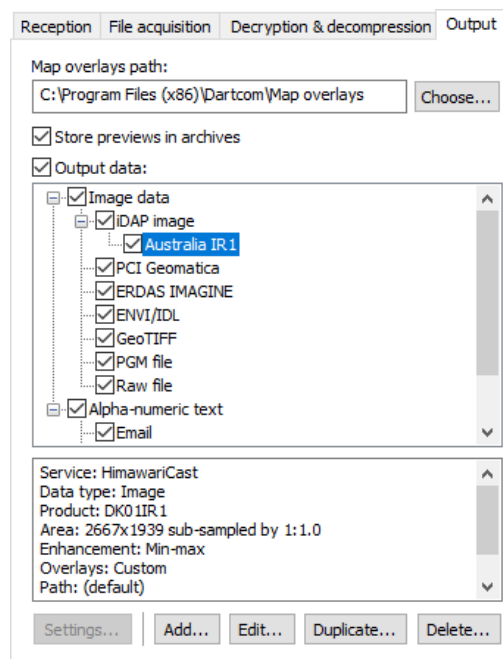
- 16 In the **Save** area of the **iDAP image output settings** window, ensure **Path** is set to **Use default**, then set **File name** to **Use output name**.
- 17 Ensure **Archive** is switched off. The window should now resemble figure 3.6.

Figure 3.6
The **Australia IR1**
output fully set up



- 18 Click **OK** to add the output. The **Output** tab should now resemble figure 3.7, with a new output named **Australia IR1** listed beneath **Image data>iDAP image**. Its settings are shown in the box below the **Output data** box.

Figure 3.7
The **Output** tab with the
Australia IR1 iDAP
image output added



- 19 Click **Apply settings** (below the **Output** tab).

- 20 In the **Latest data** list within the **Output** area in the **Status** area, select **HimawariCast>Image data>Image>DK01IR1**. Its preview will be displayed on the right-hand side. Wait until all of its segments have been received, then move on to the next tutorial which will show you how to view the resulting image in iDAP.



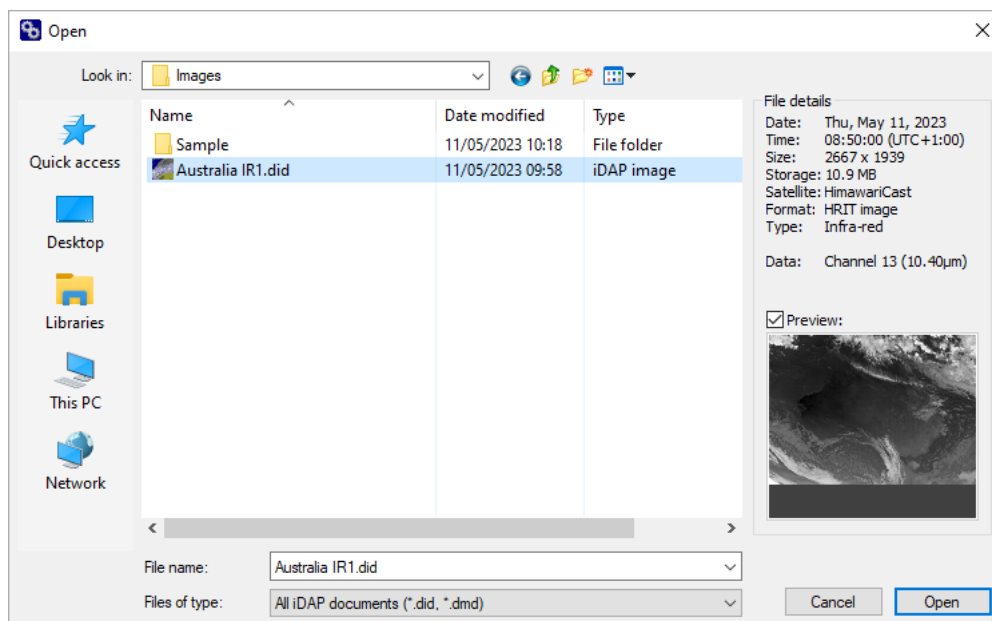
If all segments had already been received when you clicked **Apply settings**, you will need to wait for the next transmission of the DK01IR1 product before moving on. This is because outputs are produced immediately after the last segment of their corresponding product (or products) has been received.

Tutorial 2: Opening an iDAP image

This tutorial will show how to open the iDAP image that was created by the Geostationary Ingester output you added in tutorial 1.

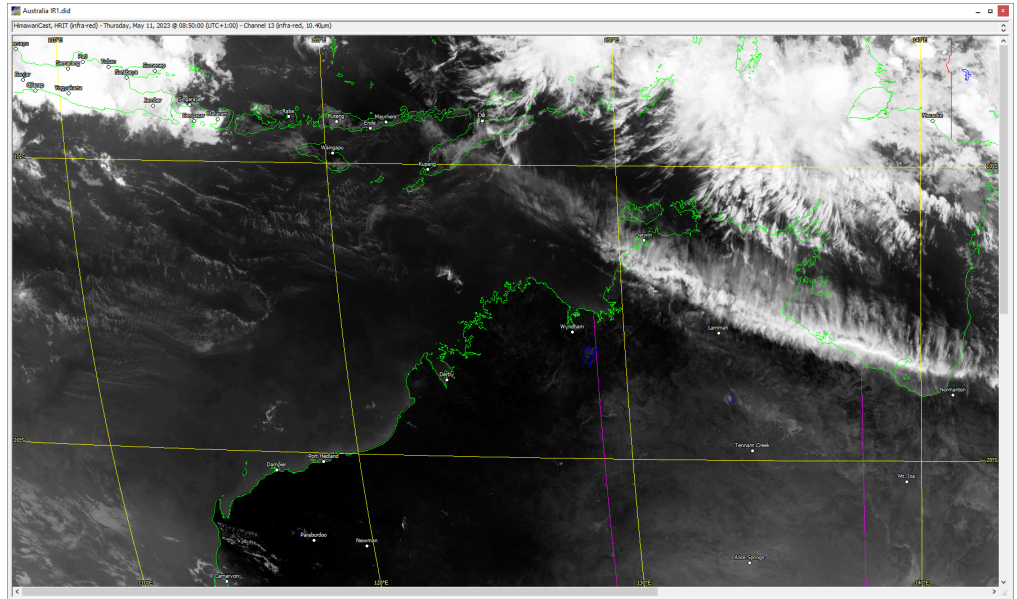
- 1 If it is not already running, start iDAP from the Windows **Start** menu.
- 2 In the **View** menu, ensure **Palette key**, **Station position**, **Points features**, **Track features**, **Range rings**, **Overlays**, **Lat/lon legends**, **Tool bar**, **Read-outs panel** and **Status bar** are switched on.
- 3 Select **File>Open....** The **Open** window (figure 3.8) is displayed. In the **Files of type** drop-list, ensure **All iDAP documents** is selected. Select the **Australia IR1** image (🖼️ icon) and click **Open**.

Figure 3.8
The **Open** window with the **Australia IR1** image selected



- 4 The **Australia IR1** image is opened in a new iDAP image window (figure 3.9). You can move the mouse over the image to see read-outs in the panel on the right-hand side of your screen. There are many processing facilities to explore, but for now move on to the next tutorial which will show you how to create an animation.

Figure 3.9
The **Australia IR1**
iDAP image

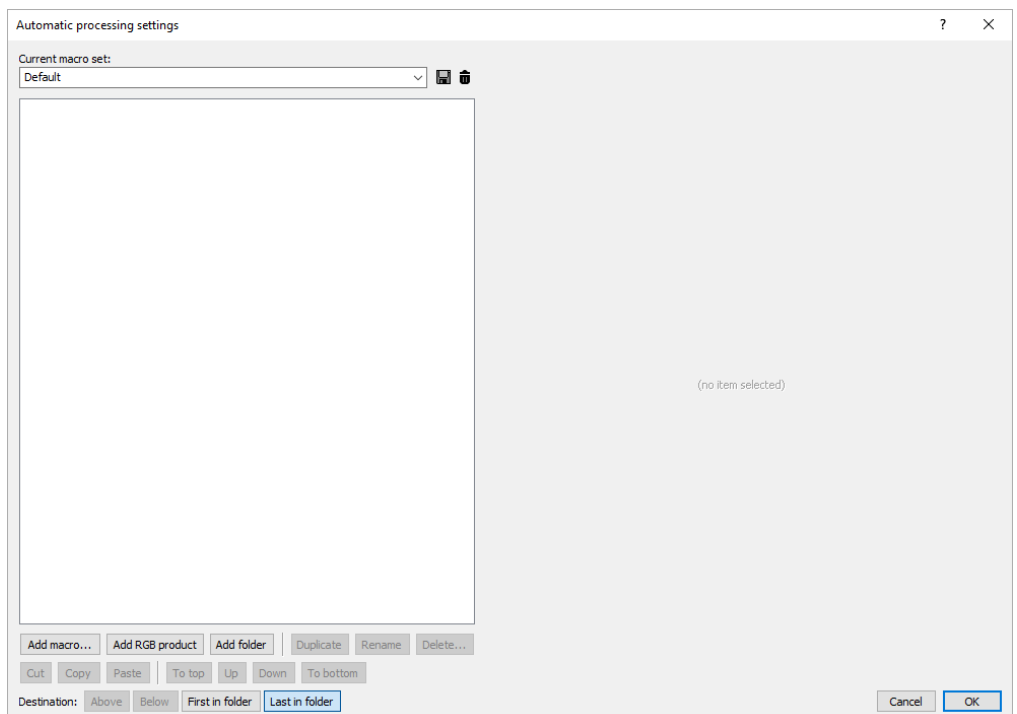


Tutorial 3: Creating an animation

This tutorial will show how to automatically animate the iDAP image output set up in tutorial 1. It will also show how to add a Blue Marble mask to a single-plane (greyscale) image to give it some colour.

- ❶ If MacroPro is not already running, start it by selecting **Utilities►Start MacroPro...** within iDAP.
- ❷ By default, MacroPro minimises itself after opening because it normally runs in the background with no user input required. Click its icon in the Windows task bar to restore it.
- ❸ Select **Utilities►Automatic processing settings....** The **Automatic processing settings** window (figure 3.10) is displayed. This allows you to set up *macros* which perform processing automatically when new images are output by Geostationary Ingester.

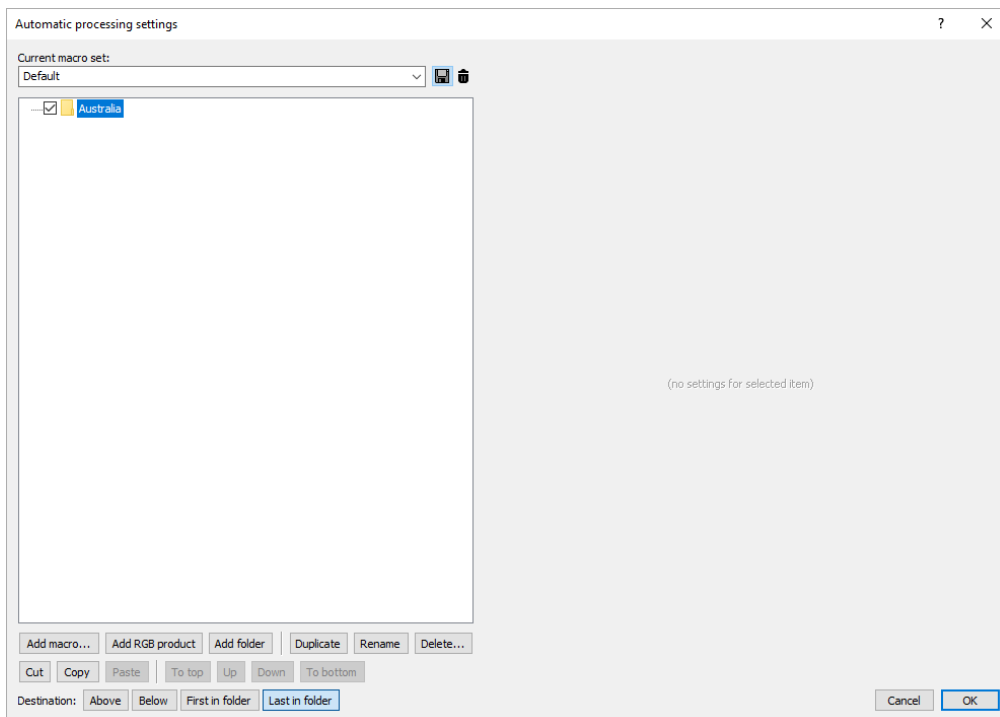
Figure 3.10
The **Automatic**
processing settings
window



- 4 Macros can be organised into folders to make them easier to find and manage. Click **Add folder** and name it **Australia**. The window should now resemble figure 3.11.

Figure 3.11

The **Australia** folder added to the macro set

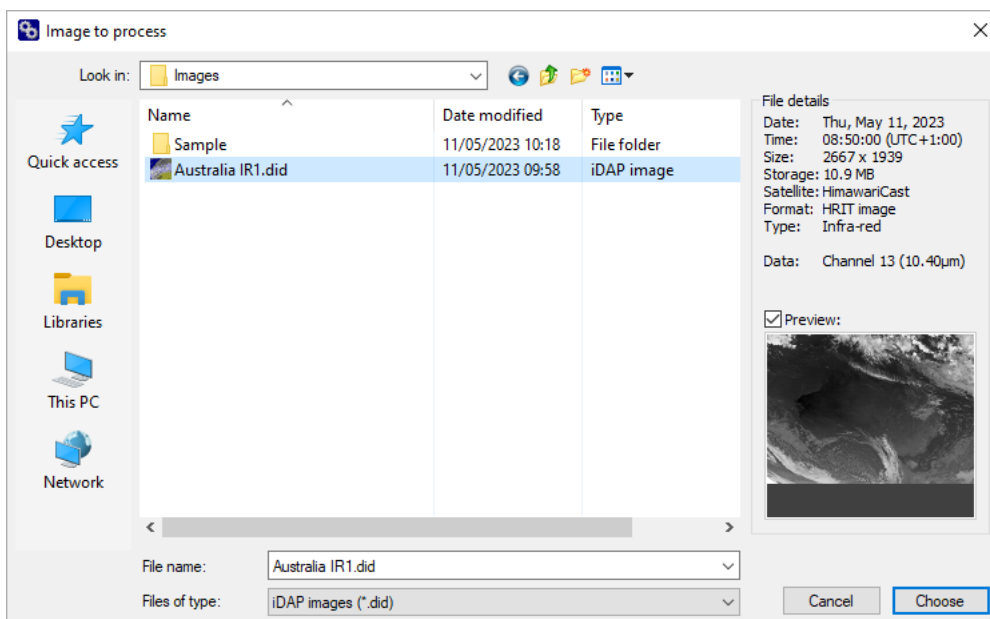


When adding folders or macros, you can choose its position by either selecting an existing item and using the Destination selector at the bottom of the window, or right-clicking an existing item to display a menu with options for adding a new item inside, above or below it. This tutorial will use the right-click approach.

- 5 Right-click the **Australia** folder and select **Add macro>Last in folder....** The **Image to process** window (figure 3.12) is displayed. Select **Australia IR1** and click **Choose**.

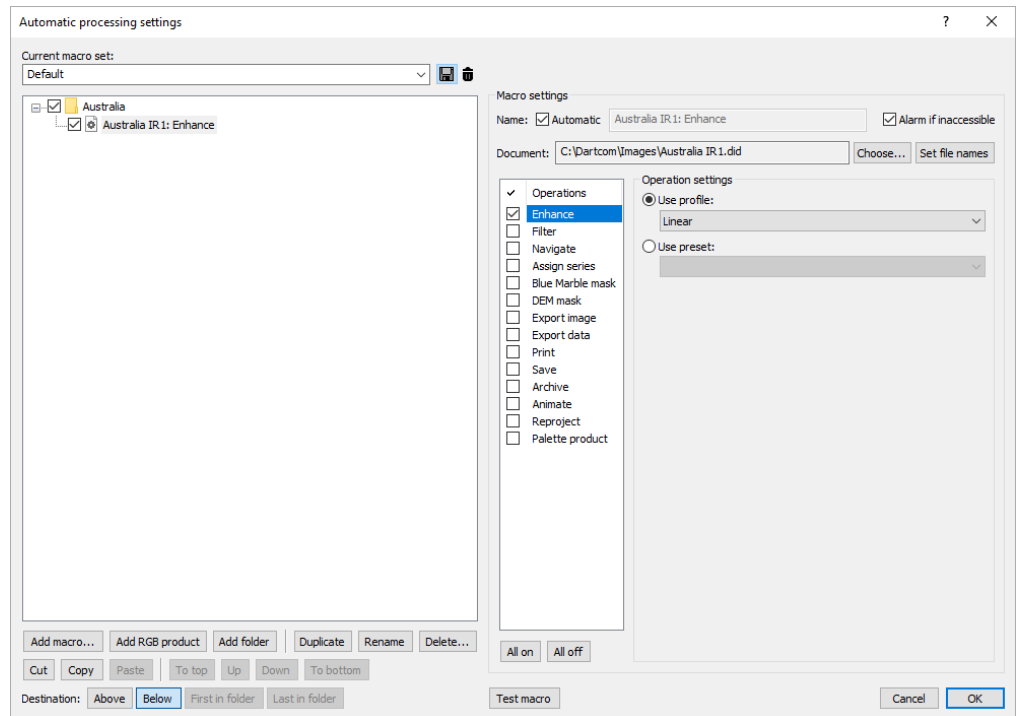
Figure 3.12

The **Image to process** window



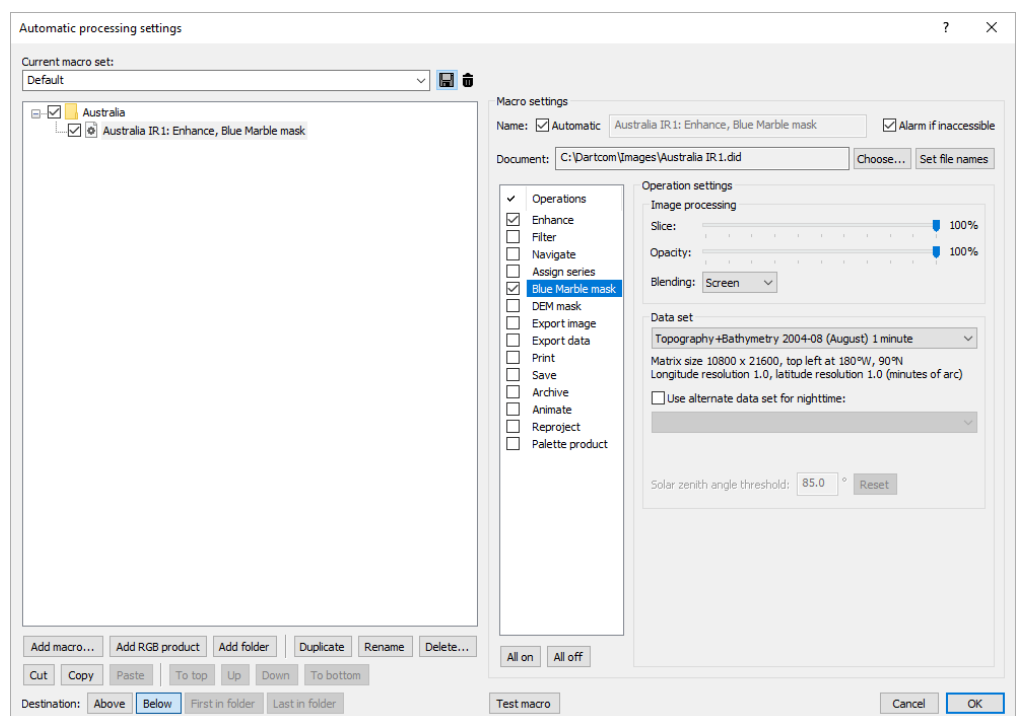
- 6 A new macro named **Australia IR1** will now have been added to the macro set. In the **Operations** list, switch on **Enhance**. Ensure **Use profile** is selected and **Linear** is selected in the drop-list below it. This will ensure the animation frames have even contrast regardless of the time of day. The window should now resemble figure 3.13.

Figure 3.13
The **Enhance** operation
switched on and
configured



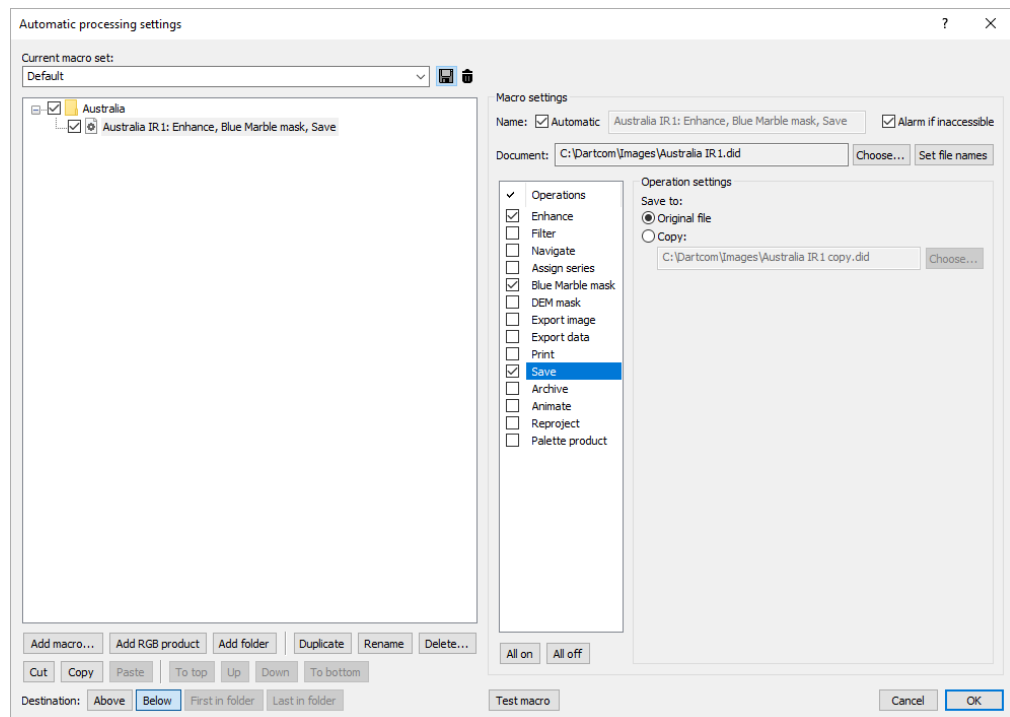
- 7 In the **Operations** list, switch on **Blue Marble mask**. Ensure **Slice** and **Opacity** are both set to 100% and **Blending** is set to **Screen**. In the **Data set** drop-list, select **Topography+Bathymetry 2004-08 (August) 1 minute**. The window should now resemble figure 3.14.

Figure 3.14
The **Blue Marble mask**
operation switched on
and configured



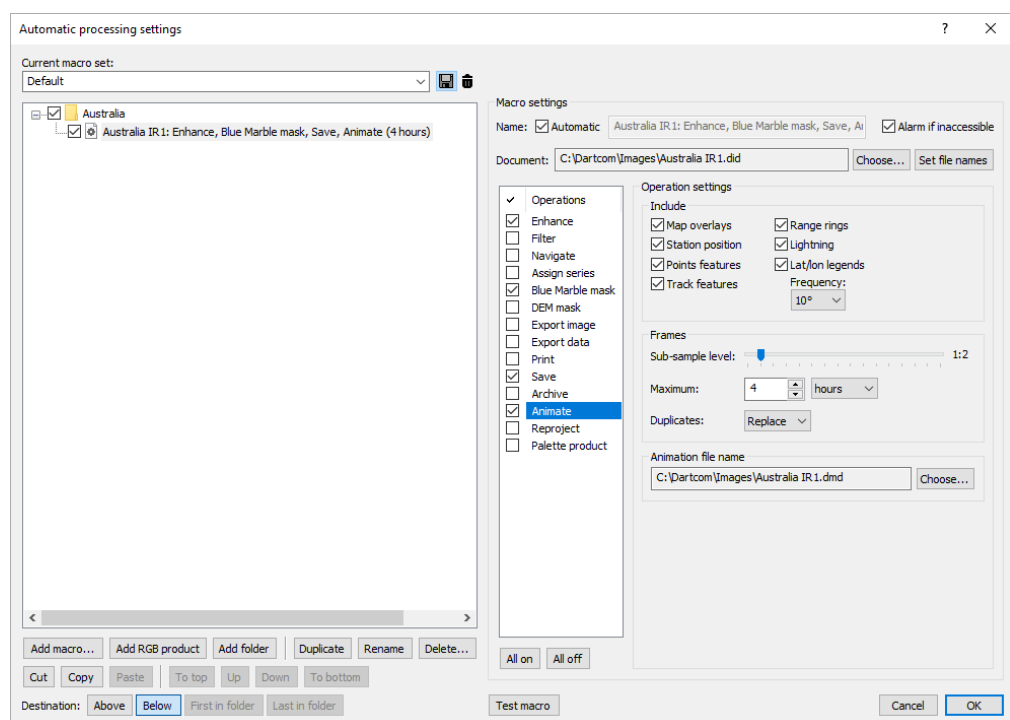
- 8 In the **Operations** list, switch on **Save**. Ensure **Original file** is selected. This will cause the enhancement and Blue Marble mask to be saved. The window should now resemble figure 3.15.

Figure 3.15
The **Save** operation
switched on



- 9 In the **Operations** list, switch on **Animate**. Ensure all the options in the **Include** area are switched on and **Frequency** is set to 10°. Set **Sub-sample level** to 1:2 so the animation is half the size of the original image. Set **Maximum** to 4 and select **hours** in the drop-list. The window should now resemble figure 3.16.

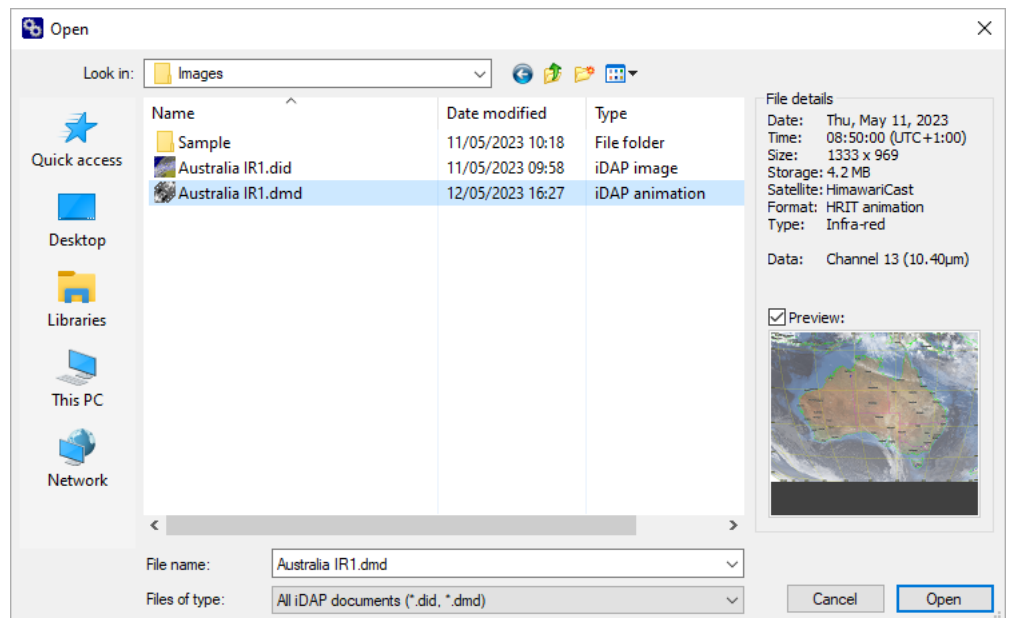
Figure 3.16
The **Animate** operation
switched on and
configured



- 10 Click  to save the changes to the macro set.

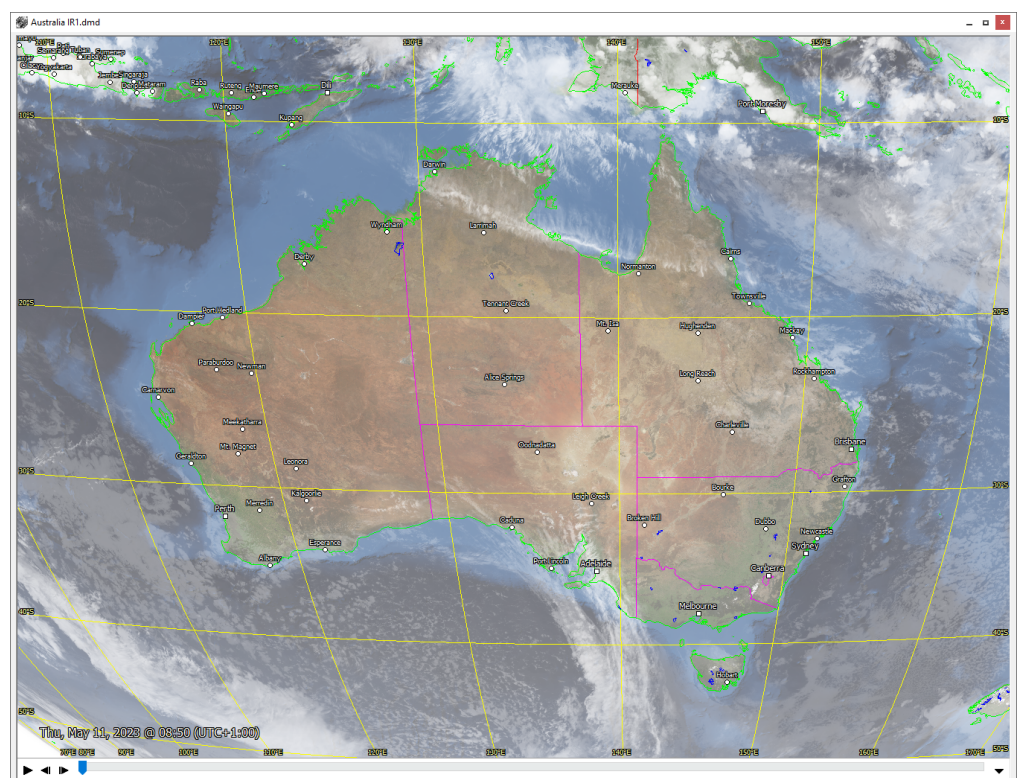
- 11 Click **Test macro** (below the **Macro settings** area). After the test, a message will appear telling you if it was successful, and if not, what the problem was.
- 12 Click **OK** to close the **Automatic processing settings** window.
- 13 Select **File>Open....** The **Open** window (figure 3.17) is displayed. In the **Files of type** drop-list, ensure **All iDAP documents** is selected. Select the **Australia IR1** animation (🌐 icon) and click **Open**.

Figure 3.17
The **Open** window with
the **Australia IR1**
animation selected



- 14 The **Australia IR1** animation is opened in a new iDAP animation window (figure 3.18). It will only have one frame at this point, but opening it allows you to check the macro's results and alter its settings if needed.

Figure 3.18
The **Australia IR1**
animation



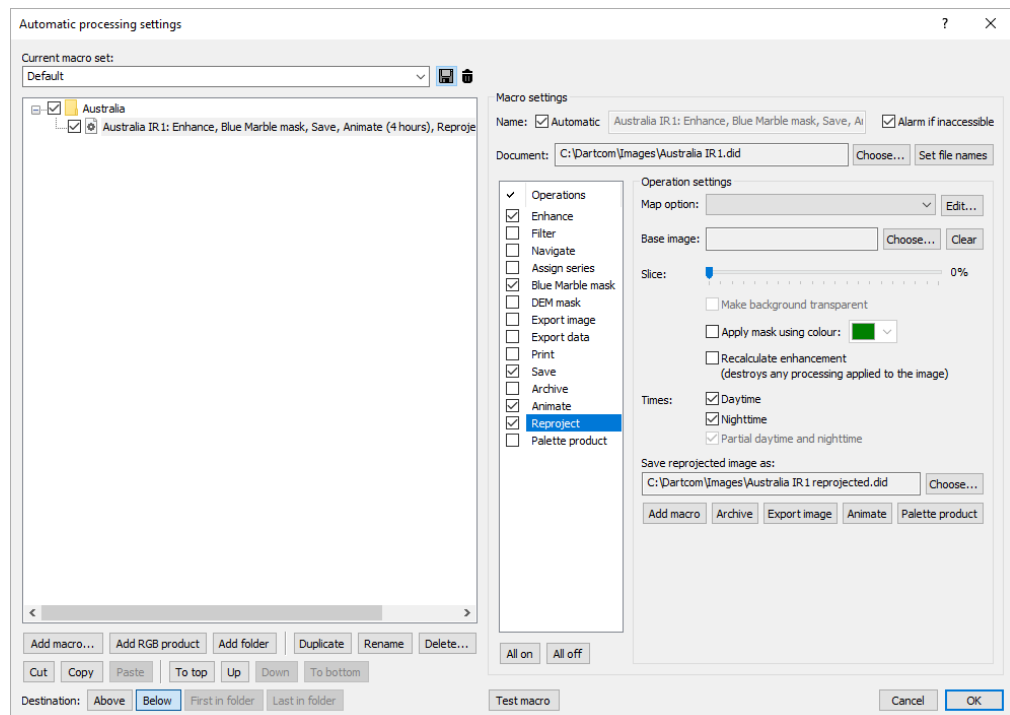
- 15 Close the animation window, then move on to the next tutorial.

Tutorial 4: Reprojecting an image

This tutorial will show how to automatically *reproject* an image, which is normally done to remove the perspective distortion inherent in a satellite view. Reprojecting an image in iDAP and MacroPro involves warping it into a *map option*, which defines a cartographic projection (such as Mercator or Polar Stereographic), geographical area, physical image size and overlay settings. The reprojected image is saved as a new iDAP image document.

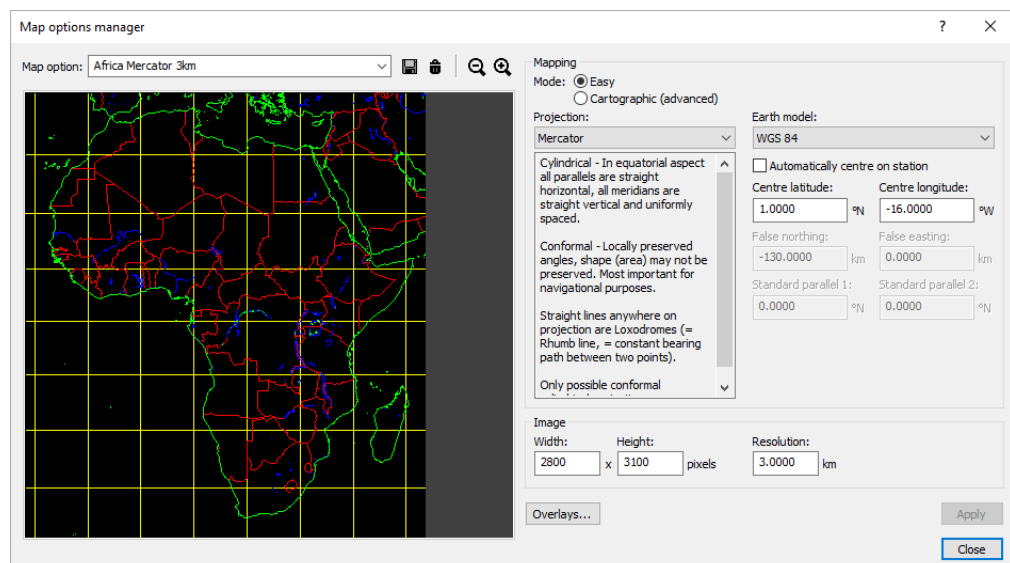
- 1 Select **Utilities►Automatic processing settings...**, then select the **Australia IR1** macro. In the **Operations** list, switch on **Reproject**. The **Automatic processing settings** window should now resemble figure 3.19.

Figure 3.19
The **Reproject**
operation
switched on



- 2 Next to the empty **Map option** drop-list, click **Edit...**. The **Map options manager** window (figure 3.20) is displayed with one of the existing map options selected.

Figure 3.20
The **Map options**
manager window




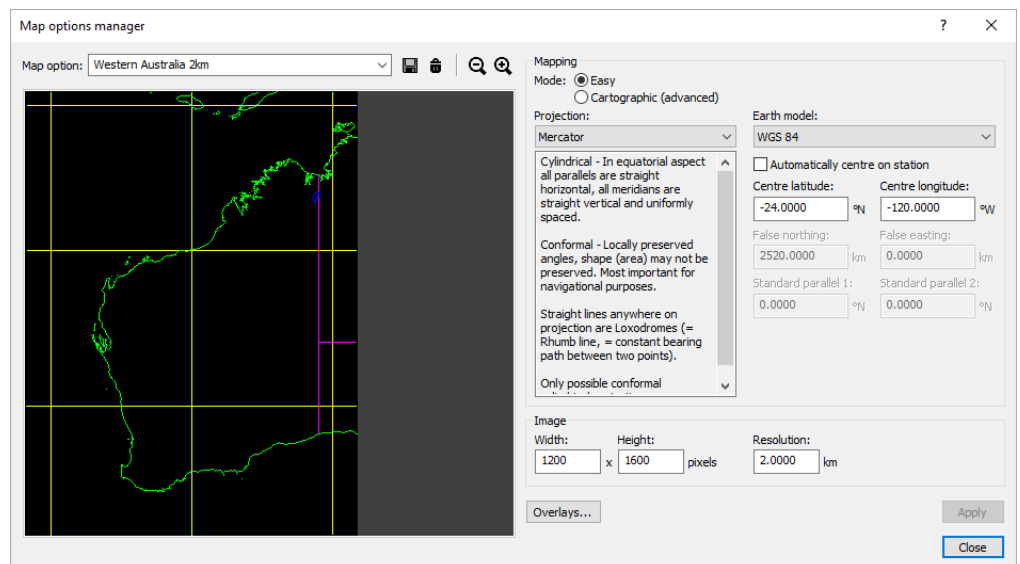
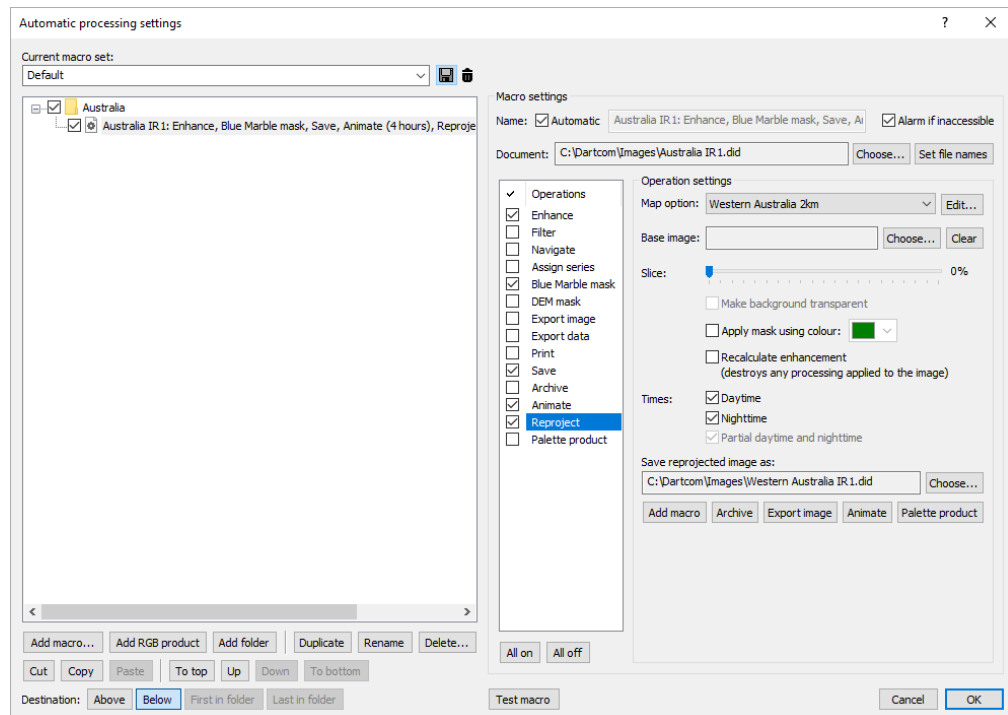
- ③ In the **Map option** drop-list, select (**new**) to create a new map option. In the **Mapping** area, ensure **Mode** is set to **Easy**, **Projection** is **Mercator**, **Earth model** is **WGS 84** and **Automatically centre on station** is switched off. For **Centre latitude** enter **-24** and for **Centre longitude** enter **-120**. Note that latitudes south of the equator and longitudes east of 0° must be entered as negative numbers.
- ④ In the **Image** area, enter **1200** for **Width**, **1600** for **Height** and **2** for **Resolution**.
- ⑤ Click **Overlays...** and add the **Australia state boundaries** overlay as described in step ⑭ of tutorial 1.
- ⑥ Click **Apply** to redraw the map option.
- ⑦ In the **Map option** drop-list, enter **Western Australia 2km**, then click the  icon. The window should now resemble figure 3.21.

Figure 3.21
The **Map options manager** window configured for Western Australia



- ⑦ Click **Close** to return to the **Automatic processing settings** window. Notice that **Map option** has now been set to **Western Australia 2km**.
- ⑧ Next to the **Save reprojected image as** box, click **Choose...** and change the name to **Western Australia IR1**. The **Automatic processing settings** window should now resemble figure 3.22.

Figure 3.22
The **Reproject**
operation configured
for Western Australia




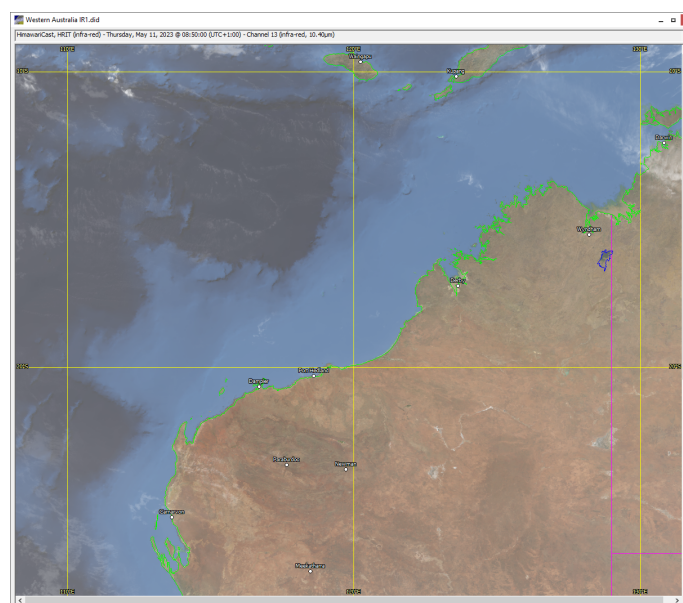
- 9 Click  to save the changes to the macro set.
- 10 If desired, click **Test macro** and open the reprojected image to check it (figure 3.23) then return to the **Automatic processing settings** window as shown in figure 3.22 and continue to the next tutorial.

Figure 3.23
The **Western**
Australia IR1 image



Tutorial 5: Creating a palette product

This tutorial will show how to automatically create a *palette product*, which involves calculating a value for each pixel in an image and colouring the image using a palette that corresponds values to colours. The palette product is saved as a new iDAP image document.

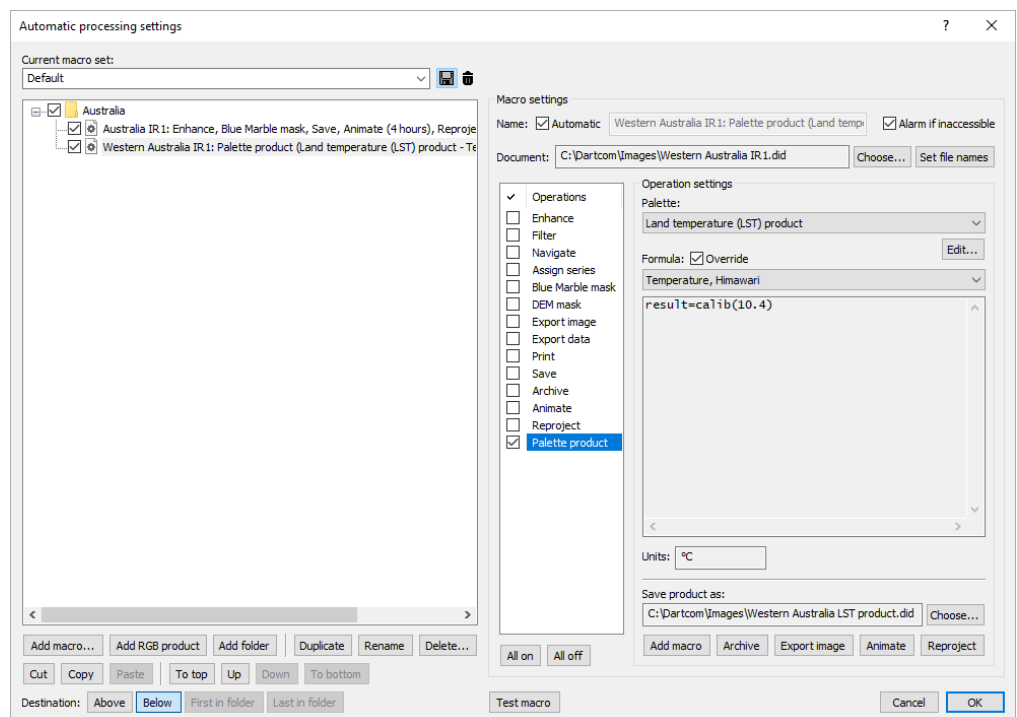
For this tutorial, the palette product will be created from the reprojected image produced by the **Australia IR1** macro configured in the previous tutorials.



Note that the Palette product operation for the Australia IR1 macro will use the original image, not the reprojected one. This is because the Reproject operation produces a new iDAP image document. Therefore to create a palette product from a reprojected image, it is necessary to add a new macro for it.

- ❶ Assuming you are in the **Automatic processing settings** window and it resembles figure 3.22, in the **Operation settings** area notice the row of buttons under the **Save reprojected image as** box. The **Add macro** button creates a new macro for the reprojected image. The other buttons do the same but also switch on the corresponding operation. So to add a macro that creates a palette product for the **Western Australia IR1** reprojected image, click the **Palette product** button.
- ❷ The **Palette product** settings for the new macro will have been displayed automatically. In the **Palette** drop-list, select **Land temperature (LST) product**. To ensure the correct formula is used, switch on **Override** and in the **Formula** drop-list, select **Temperature, Himawari**.
- ❸ Next to the **Save product as** box, click **Choose...** and change the name to **Western Australia LST product**. The **Automatic processing settings** window should now resemble figure 3.24.

Figure 3.24
The **Palette product** operation configured for land temperature




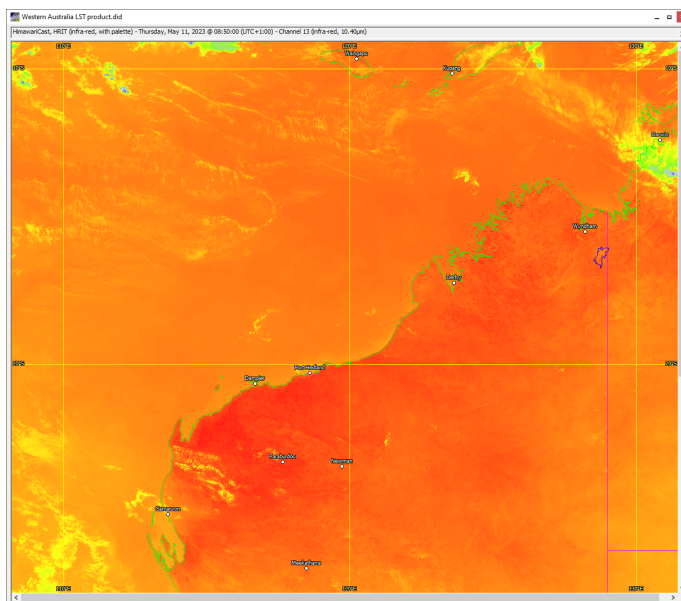
- ❹ Click  to save the changes to the macro set.
- ❺ If desired, click **Test macro** and open the palette product to check it (figure 3.25), then return to the **Automatic processing settings** window as shown in figure 3.24 and continue to the next tutorial.

Figure 3.25

The **Western Australia LST** product image

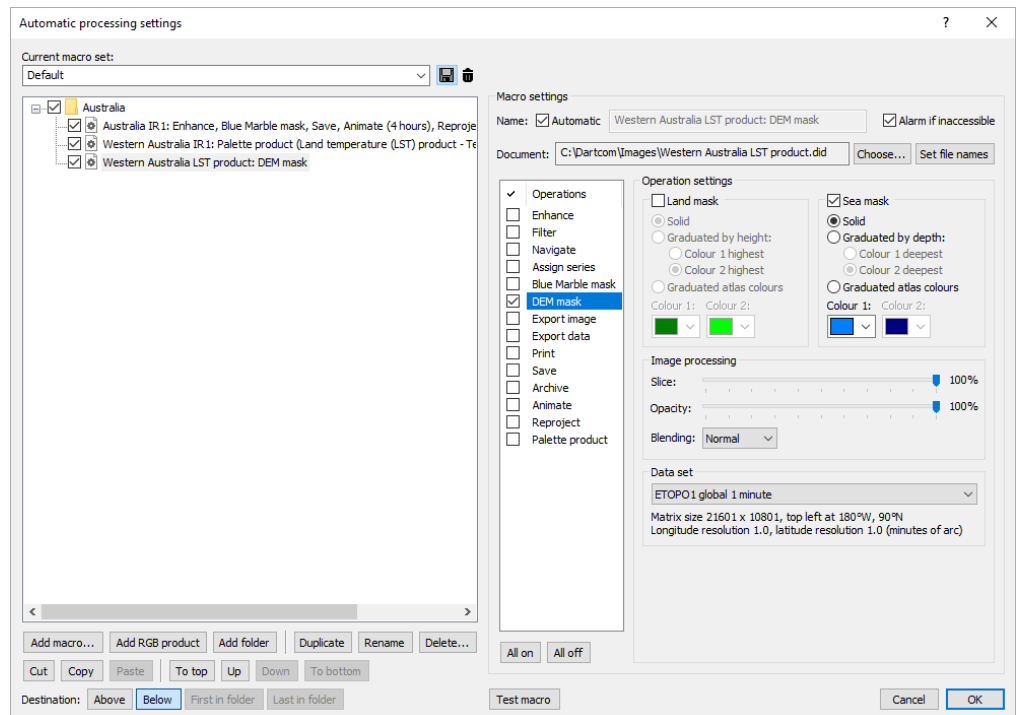


Tutorial 6: Masking a palette product

This tutorial will show how to automatically apply a mask to a palette product. This is normally done to obscure irrelevant areas, such as sea in a land temperature product.

- ❶ Assuming you are in the **Automatic processing settings** window and it resembles figure 3.24, in the **Operation settings** area notice the row of buttons under the **Save product as** box. To add a macro for the **Western Australia LST** product image, click the **Add macro** button.
- ❷ The new macro will have been displayed automatically. In the **Operations** list, switch on **DEM mask**.
- ❸ In the **Operation settings** area, switch off **Land mask**, switch on **Sea mask** and ensure **Solid** is selected.
- ❹ In the **Image processing** area, set **Blending** to **Normal**.
- ❺ In the **Data set** area, select **ETOPO1 global 1 minute**. The window should now resemble figure 3.26.

Figure 3.26
The **DEM mask**
operation switched
on and configured




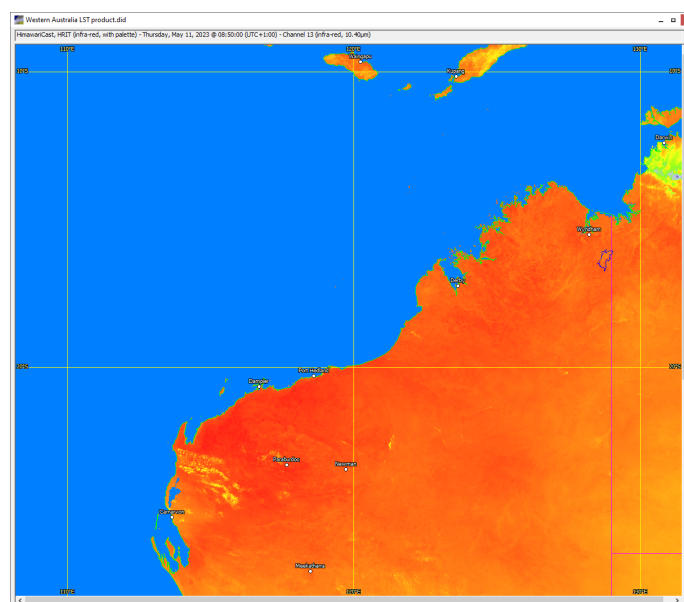
- 6 In the **Operations** list, switch on **Save**. Ensure **Original file** is selected. This will cause the DEM mask to be saved.
- 7 Click  to save the changes to the macro set.
- 8 If desired, click **Test macro** and open the masked palette product to check it (figure 3.27).

Figure 3.27
The **Western Australia LST product** image with
DEM mask applied



Tutorial 7: Setting up source images for RGB products

This tutorial shows how to set up iDAP image outputs in Geostationary Ingester to enable *RGB products* to be created from Himawari images using iDAP and MacroPro.



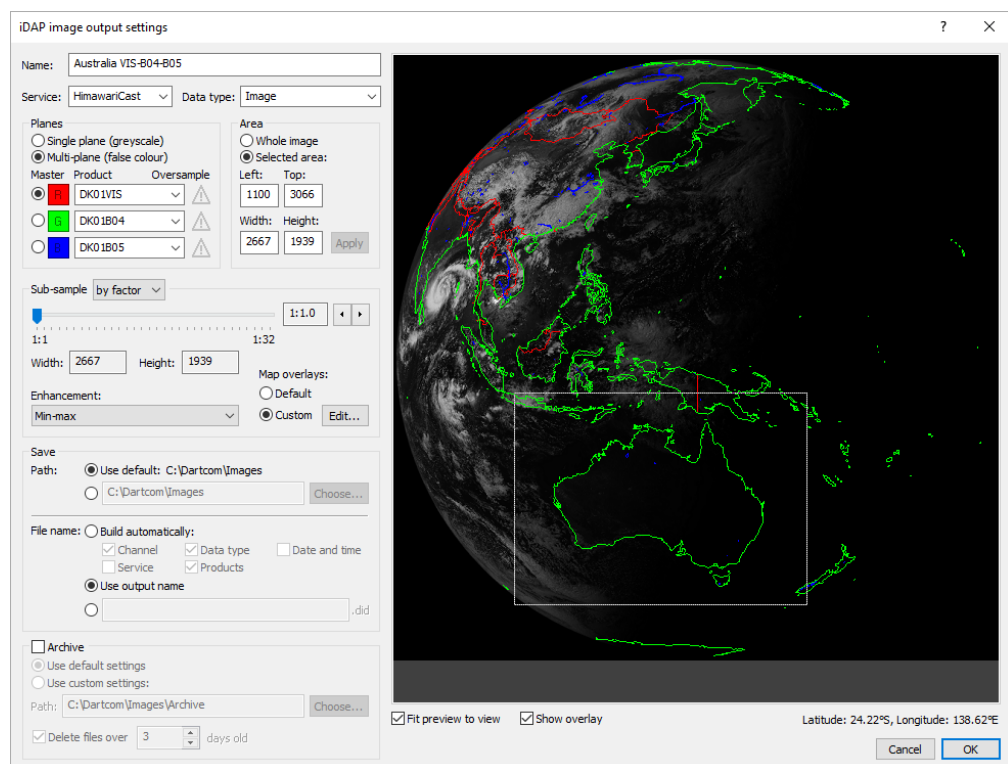
We strongly recommend reading section 4 of the iDAP/MacroPro software user guide before starting this tutorial to gain an understanding of RGB products and their associated concepts.



Bands 1 (0.47µm) and 2 (0.5µm) are not transmitted on the HimawariCast service, so not all of the Himawari RGB products can be created.

- ❶ Switch to **Geostationary Ingestor**, then in the **Output** tab of the **HimawariCast HRIT** tab, right-click the **Australia IR1** iDAP image output created in tutorial 1 and select **Duplicate output...**. The **iDAP image output settings** window is displayed.
- ❷ In the **Name** box change the name to **Australia VIS-B04-B05**.
- ❸ In the **Planes** area select **Multi-plane (false colour)**.
- ❹ In the **Product** drop-list for the red plane, select **DK01VIS**. For the green plane, select **DK01B04**, and for the blue plane, **DK01B05**. The window should now resemble figure 3.28.

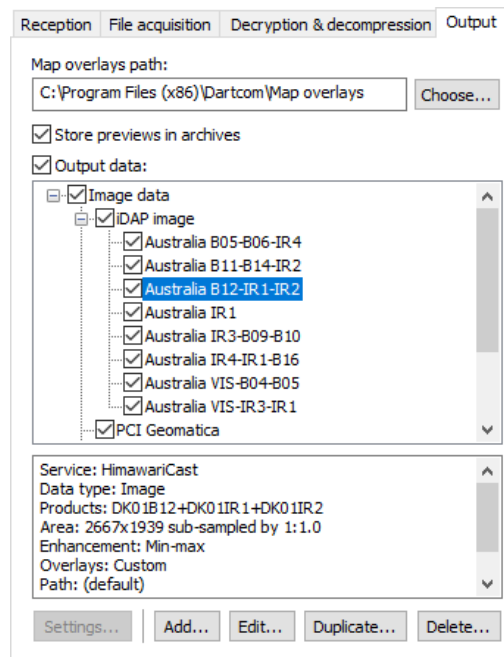
Figure 3.28
The **Australia VIS-B04-B05**
iDAP image output set up



- ❺ Click **OK** to add the output, which will be listed in the **Output** tab beneath **Image data**►**iDAP image** as in tutorial 1 and automatically selected.
- ❻ Click **Duplicate...** and add another output named **Australia VIS-IR3-IR1** with **DK01VIS** on the red plane, **DK01IR3** on green and **DK01IR1** on blue.
- ❼ Click **Duplicate...** and add **Australia B05-B06-IR4** with **DK01B05** on red, **DK01B06** on green and **DK01IR4** on blue.
- ❽ Click **Duplicate...** and add **Australia IR4-IR1-B16** with **DK01IR4** on red, **DK01IR1** on green and **DK01B16** on blue.
- ❾ Click **Duplicate...** and add **Australia IR3-B09-B10** with **DK01IR3** on red, **DK01B09** on green and **DK01B10** on blue.
- ❿ Click **Duplicate...** and add **Australia B11-B14-IR2** with **DK01B11** on red, **DK01B14** on green and **DK01IR2** on blue.
- ⓫ Click **Duplicate...** and add **Australia B12-IR1-IR2** with **DK01B12** on red, **DK01IR1** on green and **DK01IR2** on blue.

- 12 The **Output** tab should now resemble figure 3.29. Click **Apply settings**, then wait at least 20 minutes before continuing to the next tutorial to ensure all the source images have been created.

Figure 3.29
The **Output** tab with the RGB product source image outputs added

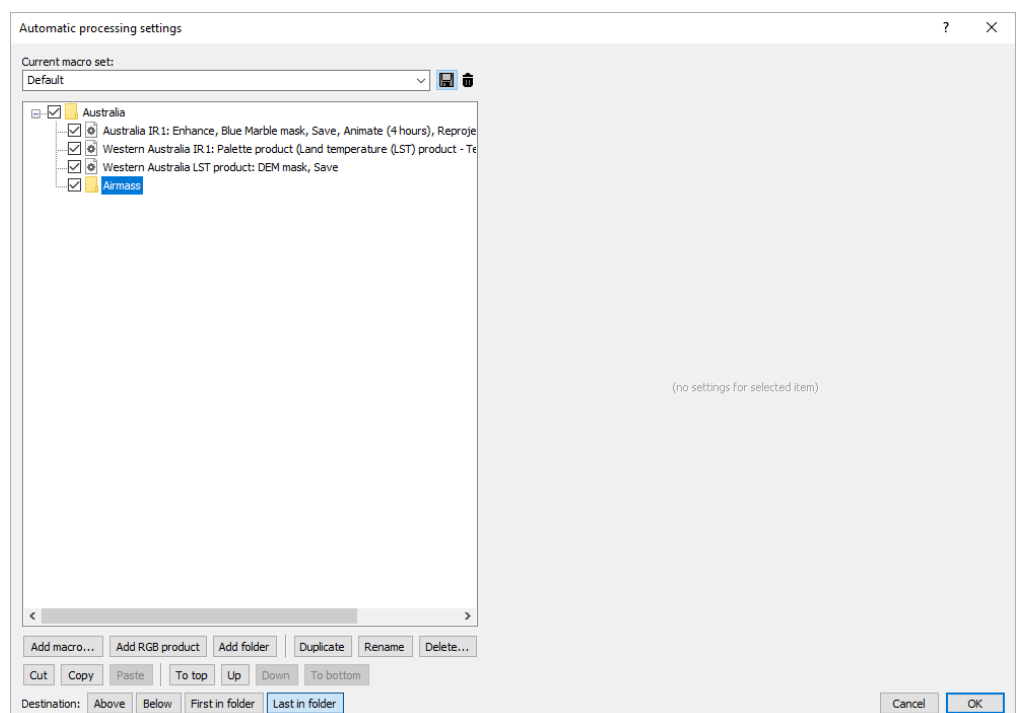


Tutorial 8: Creating an RGB product

This tutorial shows how to automatically create an RGB product using the source images set up in the previous tutorial.

- 1 Switch to MacroPro, then go into the **Automatic processing settings** window (**Utilities**►**Automatic processing settings...**).
- 2 Right-click the **Australia** folder, then select **Add folder**►**Last in folder** and name it **Airmass**. The window should now resemble figure 3.30.

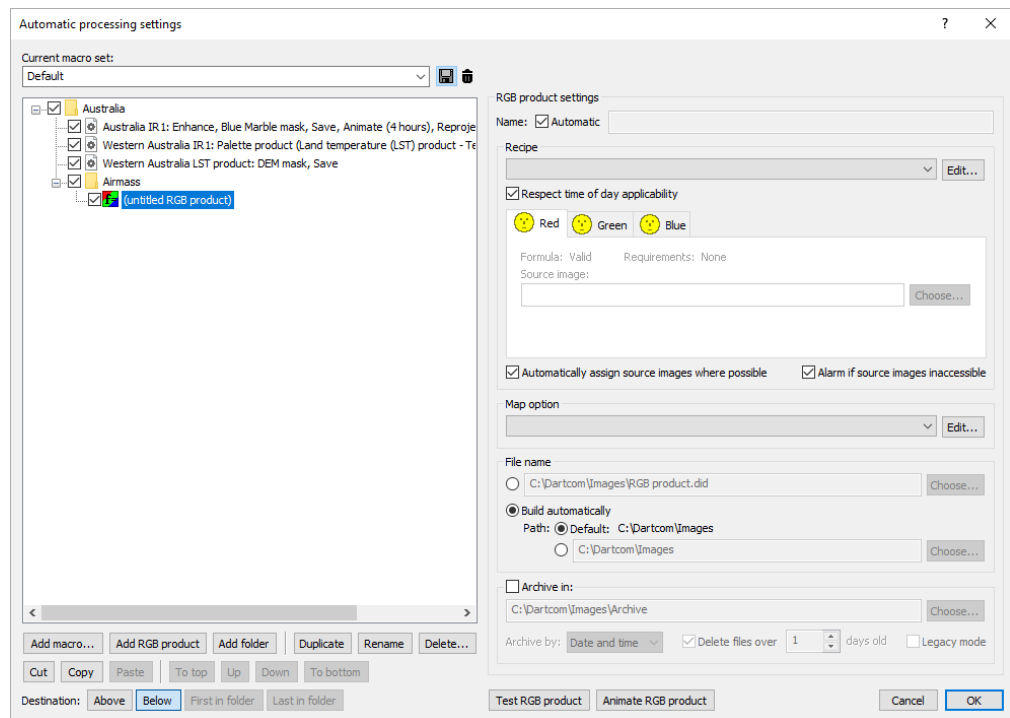
Figure 3.30
The **Airmass** folder added to the macro set



- 3 Right-click the **Airmass** folder and select **Add RGB product**►**Last in folder**. The window should now resemble figure 3.31.

Figure 3.31

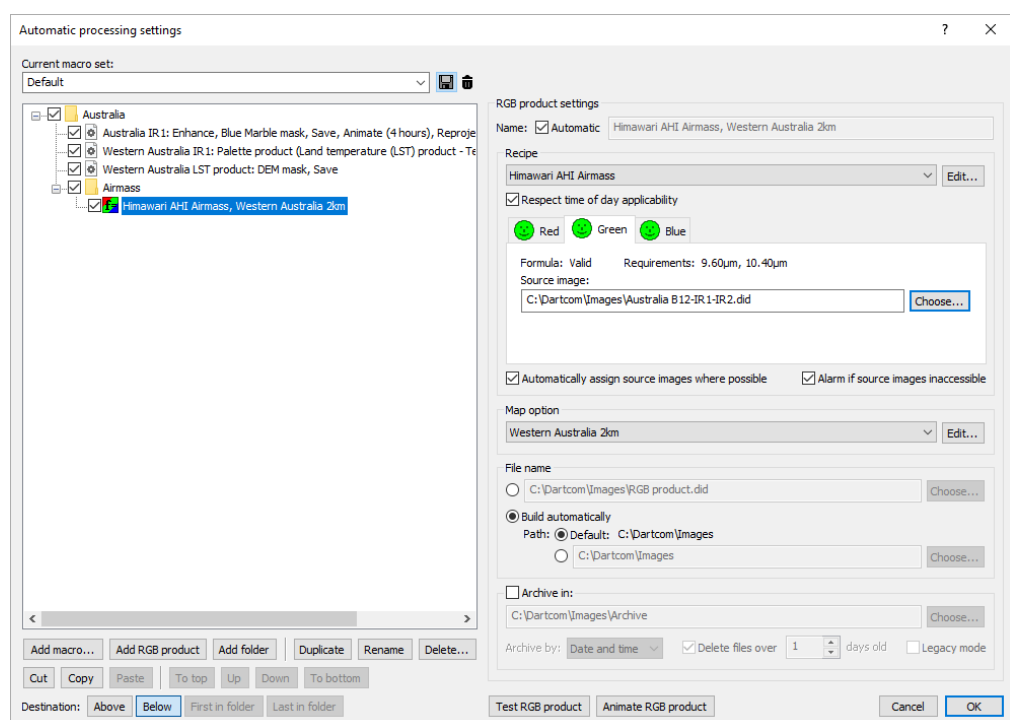
A new RGB product added to the **Airmass** folder



- 4 In the **Recipe** area, select **Himawari AHI Airmass**.
- 5 In the **Red** tab, click **Choose...** and select the **Australia IR3-B09-B10** source image created in the previous tutorial. This image will automatically be assigned to the blue plane too because it meets the requirements.
- 6 In the **Green** tab, click **Choose...** and select **Australia B12-IR1-IR2**.
- 7 In the **Map option** area, select **Western Australia 2km**. The window should now resemble figure 3.32.

Figure 3.32

The **Himawari AHI Airmass, Western Australia 2km** RGB product added




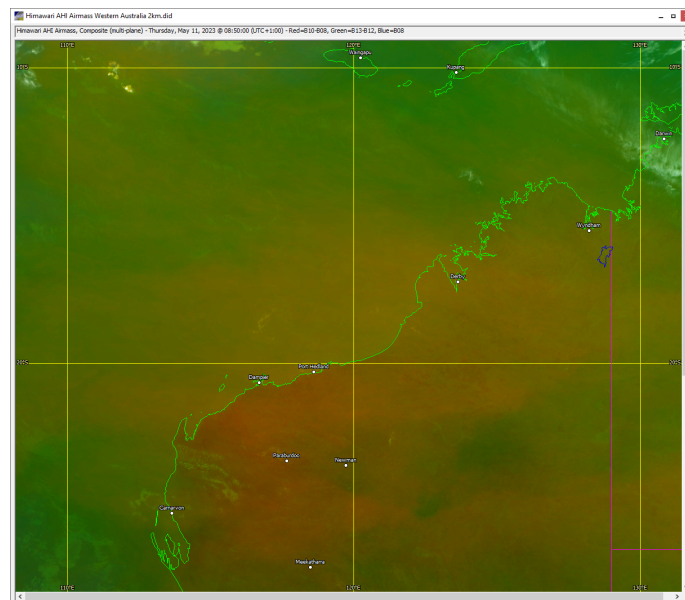
- 8 Click  to save the changes to the macro set.
- 9 Click **Test RGB product** (below the **RGB product settings** area). After the test, a message will appear telling you if it was successful, and if not, what the problem was.
- 10 Click **Close**, then select **File►Open....** and open the RGB product (named **Himawari AHI Airmass Western Australia 2km**) to check it (figure 3.33).

Figure 3.33
The **Himawari AHI Airmass Western Australia 2km** image



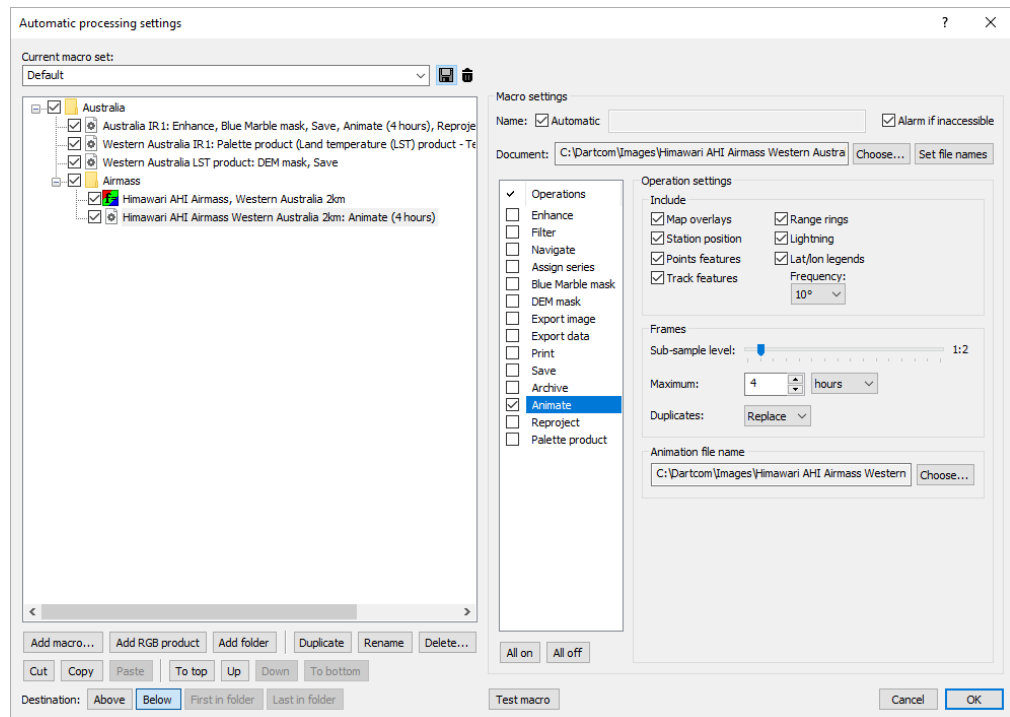
- 11 Return to the **Automatic processing settings** window as shown in figure 3.32 and continue to the next tutorial.

Tutorial 9: Animating an RGB product

This tutorial shows how to automatically animate the RGB product created in the previous tutorial.

- 1 Assuming you are in the **Automatic processing settings** window and it resembles figure 3.32, click **Animate RGB product** (below the **RGB product settings** area). This will create a new macro with the **Animate** operation switched on and automatically selected.
- 2 Ensure all the options in the **Include** area are switched on and **Frequency** is set to 10°. Set **Sub-sample level** to 1:2 so the animation is half the size of the original RGB product. Set **Maximum** to 4 and select **hours** in the drop-list. The window should now resemble figure 3.34.

Figure 3.34
The Himawari AHI
Airmass Western
Australia 2km
animation macro




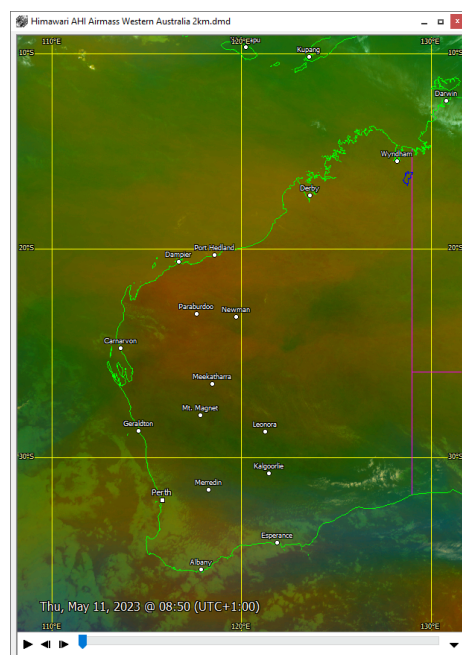
- 4 Click  to save the changes to the macro set.
- 5 If desired, click **Test macro** and open the animation to check it (figure 3.35).

Figure 3.35
The Himawari AHI
Airmass Western
Australia 2km
animation



Tips

Below are a number of useful tips, tricks and shortcuts which make many tasks in the software quicker and easier.

Geostationary Ingester

- To make Geostationary Ingester start up automatically when you switch on the host PC or after a power failure, add its shortcut icon to the Windows **Startup** folder. To display that folder, right-click the Windows **Start** button, select **Run**, then enter **shell:startup** and click **OK**.
- The **Duplicate...** button in the **Output** tab is very useful for quickly creating a number of similar outputs. For example, to create several outputs covering the same area with different products, add the first output, then repeatedly use the **Duplicate...** button, simply changing the name and products as appropriate. All the other settings will be copied from the previous macro.
- When creating a multi-plane iDAP image output, good false colour images can be obtained during daylight hours by assigning a visible product to the red and green planes and an infra-red product to the blue plane.
- To create images of a specific size (for use on a website, for example), use the **to size** sub-sampling method when adding an iDAP image output, then use a MacroPro macro to export the resulting images to JPEG or PNG format via the **Export image** operation.
- Remember to click **Apply settings** after adjusting settings otherwise they will not take effect.
- To prevent changes being made to the settings or the software being closed without authorisation, lock the software using the **Lock...** button. Make sure the password you choose is well known to you or written down and stored somewhere safe, otherwise you will not be able to unlock the software again.

MacroPro

- The **DEM mask** and **Blue Marble mask** automatic processing operations work more consistently with infra-red or water vapour images when slicing out cloud, or if using the **Screen** blending mode. This is because on visible images the pixel values corresponding to cloud vary according to the time of day. It is therefore not possible to set a slice level which works for all images, or obtain a consistent blending level.
- Make sure that you click **OK** when you have finished setting up macros in the **Automatic processing settings** window otherwise none of your macros will run. This is because automatic processing is suspended temporarily while the **Automatic processing settings** window is open.
- MacroPro is not intended for viewing images and animations (unless you are checking the results of a macro). Use iDAP instead because it provides the full range of manipulation and processing facilities whereas MacroPro only provides a very limited subset.
- If you make changes to the iDAP configuration and want to quickly apply the same changes to MacroPro, simply click the **Synchronise with iDAP** button in the MacroPro **Configuration** window (**Utilities>Configuration...**).
- To prevent changes being made to the macros or the software being closed without authorisation, lock the software using **Utilities>Lock....** Make sure the password you choose is well known to you or written down and stored somewhere safe, otherwise you will not be able to unlock the software again.

iDAP

- To make iDAP start up automatically when you switch on the host PC or after a power failure, add its shortcut icon to the Windows **Startup** folder. To display that folder, right-click the Windows **Start** button, select **Run**, then enter **shell:startup** and click **OK**.
- The **DEM masking** (**Navigation**►**DEM mask...**) and **Blue Marble masking** (**Navigation**►**Blue Marble mask...**) functions work more consistently with infra-red or water vapour images when slicing out cloud, or if using the **Screen** blending mode. This is because on visible images the pixel values corresponding to cloud vary according to the time of day. It is therefore not possible to set a slice level which works for all images, or obtain a consistent blending level.
- A number of additional tools are available for animations by clicking the ▼ button in the bottom right corner of the window. These include playback speed and looping, selection of the part of the animation to play, quick zooming and removal of unwanted frames.
- If you make changes to the iDAP configuration and want to quickly apply the same changes to MacroPro, simply click the **Synchronise with iDAP** button in the MacroPro **Configuration** window (**Utilities**►**Configuration...**).
- To prevent changes being made to the macros or the software being closed without authorisation, lock the software using **Utilities**►**Lock....** Make sure the password you choose is well known to you or written down and stored somewhere safe, otherwise you will not be able to unlock the software again.

Summary

You should now be familiar with the core functionality of the software and ready to begin exploring it in detail using the knowledge gained from the tutorials and tips as a basis.

Please refer to the separate *Geostationary Imager software user guide* and *iDAP/MacroPro software user guide* for further information.

