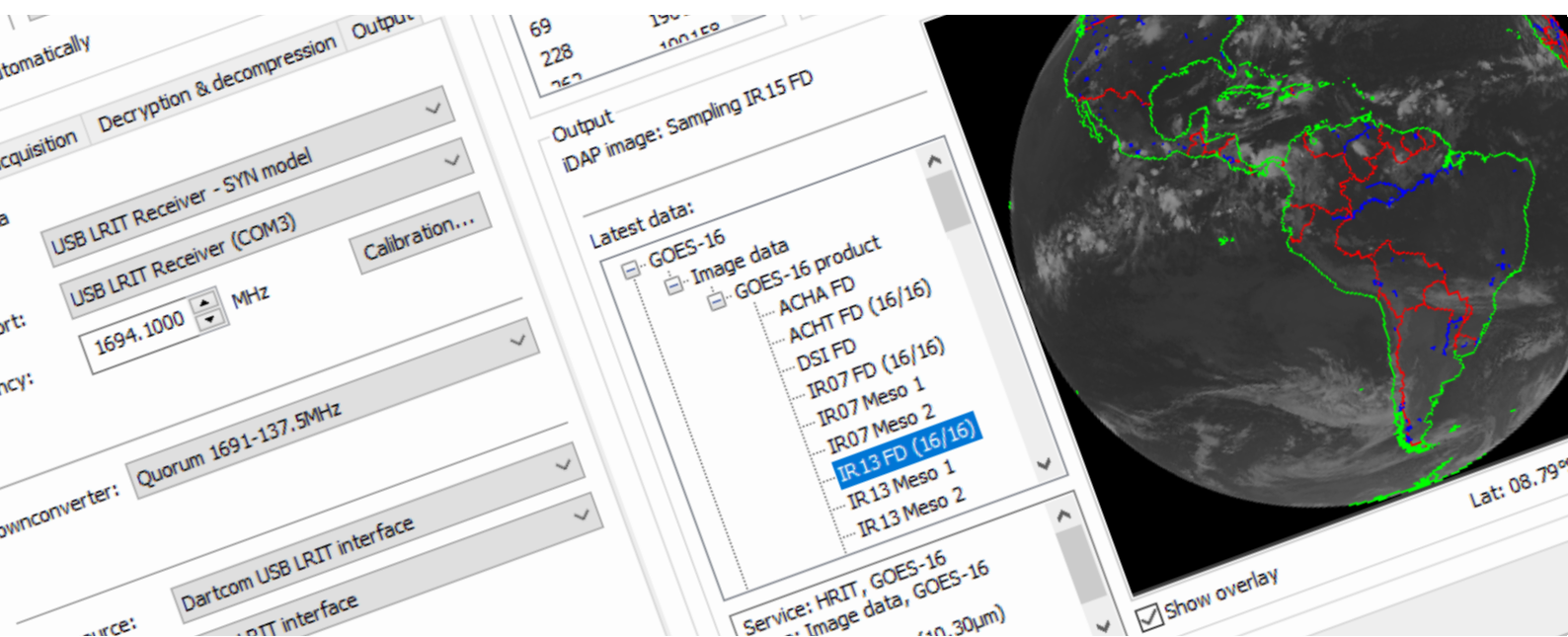




# GEOSTATIONARY INGESTER



# SOFTWARE USER GUIDE





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# **Dartcom Geostationary Ingester**

**Ingest software for EUMETCast, HimawariCast, GOES HRIT,  
GK-2A LRIT/HRIT/UHRIT and Electro LRIT/HRIT services**

## **Software user guide**

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13<sup>th</sup> edition (December 2023)

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Includes a version of the GCTP library as referenced by:

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## 1

# Overview

## Introduction

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The Dartcom Geostationary Ingester software acquires data from EUMETCast, HimawariCast, GOES HRIT, GEO-KOMPSAT-2A (GK-2A) LRIT/HRIT/UHRIT and Electro LRIT/HRIT services. It can ingest data from a receiver (L-Band services), files output by external DVB acquisition software (Ku-band and C-band services) or frames output by a demodulator (UHRIT services). It decrypts and decompresses the resulting files and archives them in raw, pre-decompression, processed and raw data forms if required.

Acquired files can then be output in a variety of formats. The image data outputs provide options such as area selection, sub-sampling and enhancement, and include:

- Single-plane (8-bit) and multi-plane (24-bit) iDAP images and charts for automatic processing, animation, exporting and printing in the Dartcom MacroPro software, and manual viewing, manipulation and processing in the Dartcom iDAP software.
- Single-plane PGM files at 8-bit or 16-bit data resolution, with optional headers, for further processing in third-party software.
- Image processing software formats such as PCI Geomatica, ERDAS IMAGINE, ENVI/IDL and GeoTIFF.

Other outputs include:

- Extraction of raw data from text and binary files.
- Output of lightning flash data to lightning database files.
- Emailing of text files (useful for service messages).
- Streaming of data from text and binary files via a serial port or TCP/IP socket.

The entire ingesting process happens automatically, with no user intervention required once the settings have been configured. Detailed activity logging is provided together with alarms displayed on-screen and sent via email, allowing the software to be monitored locally and remotely.

The Geostationary Ingester software's multi-threaded, layered architecture allows simultaneous ingest from different dissemination channels on the same ingest PC whilst conforming to timeliness requirements and using the minimum of processor time.

## Ingest PC requirements

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To provide reliable, continuous data ingest and output, the Geostationary Ingester software places certain minimum requirements on the ingest PC specifications. For a more flexible, capable system which allows visualisation and processing of the resulting data on the same PC, more demanding requirements are necessary. These are given below as the minimum and recommended specifications respectively.

### Minimum specifications

---

- 4-core processor (8-core with high single thread performance for MTG).
- 8GB RAM.
- 500GB hard disk or SSD, plus 1TB RAID for archiving.
- Dedicated graphics card (not on-board graphics) with display capable of 1024×768 resolution.
- 100Mbit Ethernet.
- 2 free USB ports.
- Windows 10/11 Pro or Enterprise (English language version).

### Recommended specifications

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- 8-core processor (high single thread performance required for MTG).
- 16GB RAM.
- 1TB hard disk or SSD, plus 2TB RAID for archiving.
- Dedicated graphics card (not on-board graphics) with display capable of 1280×1024 resolution.
- 1Gbit Ethernet.
- 2 free USB ports.
- Windows 10/11 Pro or Enterprise (English language version).

## How the software works

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The Dartcom Geostationary Ingester software consists of one or more *ingers*, each of which handles data from a particular dissemination channel, such as EUMETCast HRIT, GOES HRIT or GEO-KOMPSAT-2A (GK-2A) UHRIT.

Each ingester comprises several *layers*, each of which performs a small part of the processing required to transform raw, ingested data into usable products. The layers are linked together to form a *processing chain*, analogous to a factory production line. Each layer receives units of data (such as packets or files) from the previous layer in the chain. It processes the data as required (assembling packets into files, for example) and outputs units (assembled files, for example) to the next layer in the chain.

Each layer runs in its own *thread*, which means that it operates concurrently with the other layers and those of the other ingesters. This ensures that timeliness requirements are met because lengthy processing operations can be performed by one layer whilst the

preceding layers in the chain continue to process new data.

Thread concurrency is achieved at operating system level by sharing small chunks of the ingest PC's processor time between all the running threads. This happens so quickly that the threads appear to be running simultaneously. It is analogous to one person running up and down a production line working on each task in turn for an extremely short period of time.

A multi-core ingest PC realises the full benefits of multi-threading because it allows some threads to operate in parallel with others by sharing them out between the processor cores. Referring again to the production line analogy, this is comparable to sharing out the tasks between two or more people.

The layers in the Geostationary Ingester software are described in table 1.1. The OSI names correspond to those in the *LRIT/HRIT Global Specification* (CGMS 03).

**Table 1.1**  
Ingester layers and  
their functions

Layer	OSI name	Description
Reception	Data link	<p><b>L-Band services:</b> Programs receiver if required, ingests data from source, performs derandomisation, Reed-Solomon decoding, demultiplexing and decommutation, assembles packets, verifies packet checksums, decompresses packets if required and forwards them to file acquisition layer.</p> <p><b>UHRIT services:</b> Ingests frames from source, verifies frame checksums, performs demultiplexing and decommutation, assembles packets, verifies packet checksums and forwards them to file acquisition layer.</p> <p><b>DVB services:</b> Not applicable.</p>
File acquisition	Transport	<p><b>L-Band and UHRIT services:</b> Assembles packets received from reception layer into files and forwards them to decryption and decompression layer.</p> <p><b>DVB services:</b> Looks for new files output by DVB acquisition software and forwards them to decryption and decompression layer.</p>
Decryption and decompression	Session	Decrypts and decompresses files received from file acquisition layer if required and forwards them to output layer.
Output	Presentation	Extracts data from files received from decryption and decompression layer, creates previews and outputs products in formats suitable for use with visualisation and processing software (such as Dartcom iDAP and MacroPro).

Figure 1.1 (overleaf) shows a block diagram describing the data flow and processing for a single ingester and its layers.

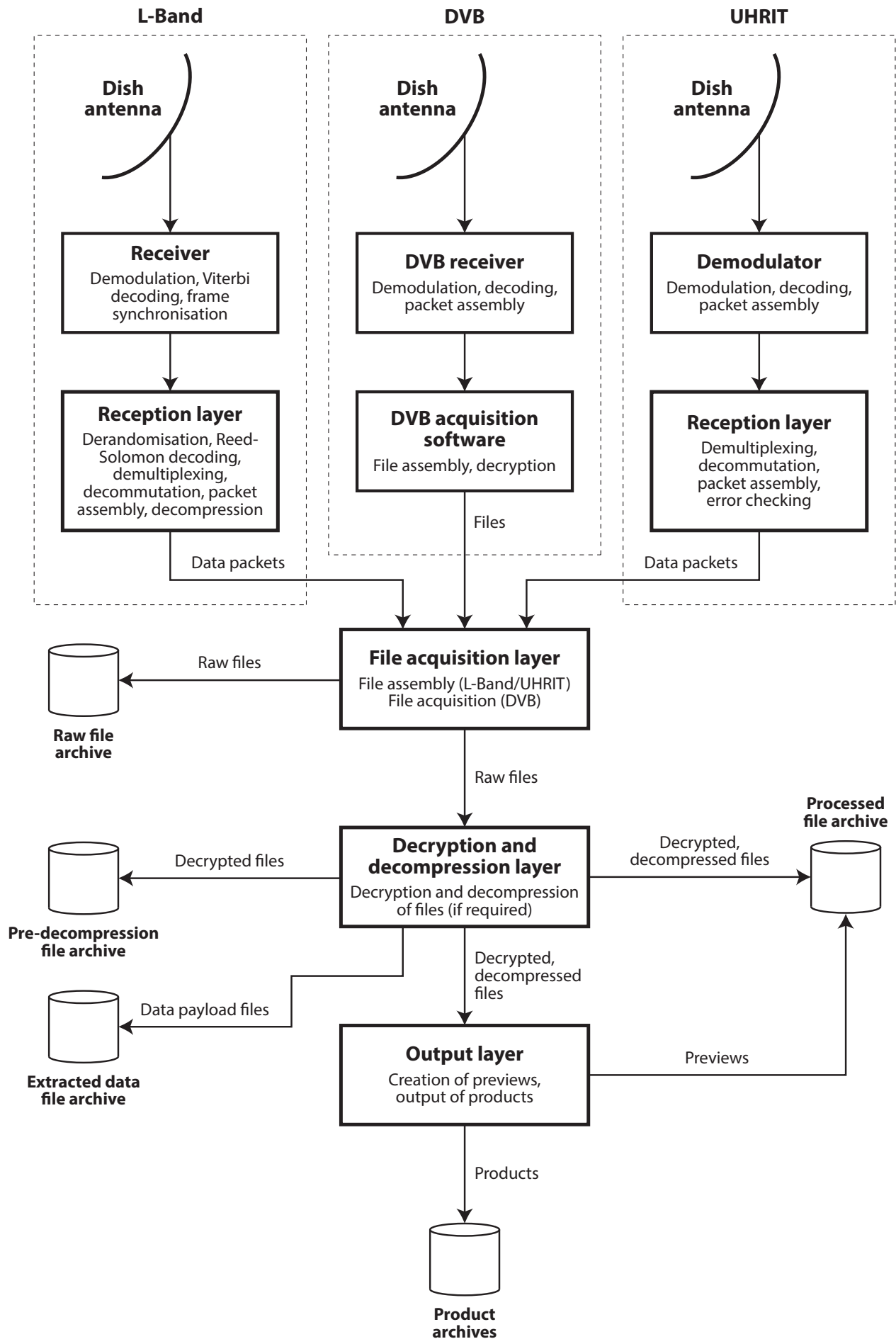


Figure 1.1 • Data flow and processing within an ingester

## Storage requirements

The numerous, frequent, high-resolution images, products and other data available from LRIT, HRIT, UHRIT and MTG services require a correspondingly large amount of storage.

To manage the level of storage usage, the Dartcom Geostationary Ingester software provides very flexible archiving facilities. If required, separate archives of raw, decrypted and decompressed data and outputs can be maintained. At the other end of the scale, no data need be archived if a very limited amount of storage is available.

The range and volume of data available on some of the LRIT, HRIT, UHRIT and MTG services are changing frequently, so some experimentation and ongoing monitoring may be required to determine the optimum setup for archiving and outputs to suit the storage available.

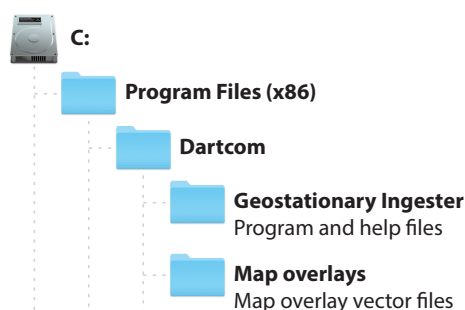


**To protect against storage filling up, Geostationary Ingester can be configured to trigger an alarm if the available space on any of the storage devices it uses falls below a preset figure. See *Diagnostics...* button in section 2 for details.**

## Folder structure

An example of the folder structure used by the Geostationary Ingester software is shown in figure 1.2. In the example, the software is installed in the **Program Files (x86)** folder on the **C:** drive, but it can be installed on any drive and in any folder on the PC.

**Figure 1.2**  
Example of the folder structure used by the Geostationary Ingester software





2

# Software reference

## Introduction

This section describes how to use the Dartcom Geostationary Ingester software. The main window is explained first, followed by each of the tabbed pages (or *tabs*) and other windows.

## Dartcom Geostationary Ingester window

The **Dartcom Geostationary Ingester** window (figure 2.1) allows the Geostationary Ingester software to be configured, controlled and monitored. A system tray icon is added which brings the window to the front when clicked and displays notifications for alarms.

**Figure 2.1**  
The **Dartcom Geostationary Ingester** window



The main part of the window is occupied by the *ingester tabs* which allow each ingester to be configured, controlled and monitored. The range of ingesters available will depend upon your software version and licence. The full range is shown in table 2.1.

**Table 2.1**

Ingesters provided in the Dartcom Geostationary Ingestor software

Ingestor	Type	Handled data
EUMETCast HRIT	DVB	HRIT from EUMETSAT EUMETCast service
EUMETCast MTG FCI	DVB	MTG FCI L1C and L2 from EUMETSAT EUMETCast service
EUMETCast MTG LI	DVB	MTG LI from EUMETSAT EUMETCast service
EUMETCast Other	DVB	SAF, GOES ABI level 1B and other data from EUMETSAT EUMETCast service
GOES LRIT	L-Band	LRIT from NOAA GOES satellites
GOES HRIT	L-Band	HRIT from NOAA GOES satellites
HimawariCast LRIT	DVB	LRIT from JMA HimawariCast service
HimawariCast HRIT	DVB	HRIT from JMA HimawariCast service
GK-2A LRIT	L-Band	LRIT from KMA GEO-KOMPSAT-2A satellite
GK-2A HRIT	L-Band	HRIT from KMA GEO-KOMPSAT-2A satellite
GK-2A UHRIT	X-Band	UHRIT from KMA GEO-KOMPSAT-2A satellite
Electro LRIT	L-Band	LRIT from RFSA Electro-L satellites
Electro HRIT	L-Band	HRIT from RFSA Electro-L satellites

All the ingesters function in a very similar way (described in section 1) and their associated tabs therefore share a consistent layout, described later in this section.

Below the ingester tabs is a row of *control buttons* which display help and diagnostics information, allow the diagnostics settings to be changed, enable the software to be locked and unlocked to prevent unauthorised tampering, allow the access level to be set and allow the software to be closed. These are described below.

## Control buttons

### Help... button

The **Help...** button displays the contents page for the Geostationary Ingestor help system, from which you can browse and search for the item with which you want help.



**To view help information for a particular window or control, click the ? icon in the title bar of the window, then click the appropriate item. If the window does not have such a button, move the mouse pointer over the item you need help with, hold down the left mouse button and press the F1 key.**

### About... button

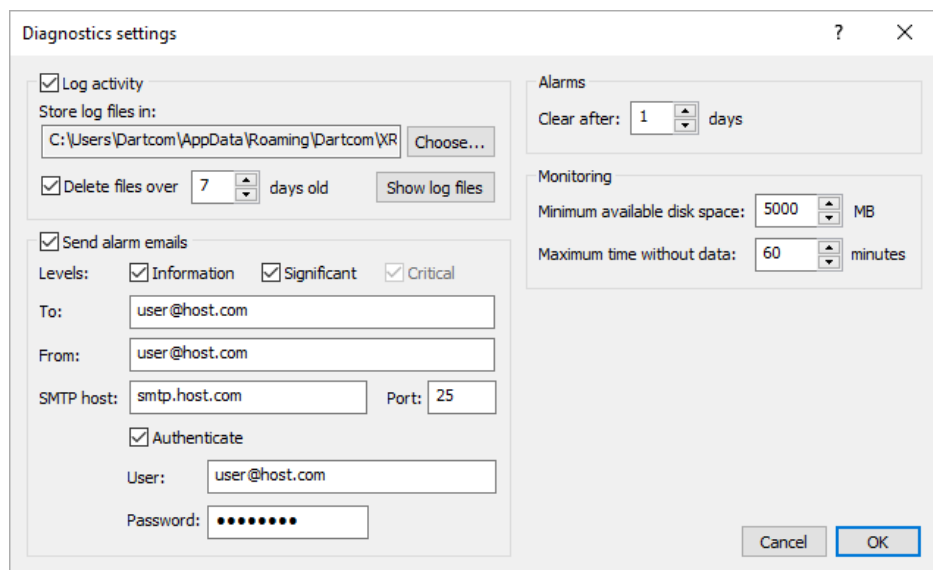
The **About...** button displays the **About** window containing the current software version, copyright information, security device details, licensed components and support contact details.



## Diagnostics... button

The **Diagnostics...** button allows activity logging and email alarms to be switched on or off and configured. The **Diagnostics settings** window (figure 2.2) is displayed.

**Figure 2.2**  
The **Diagnostics settings** window

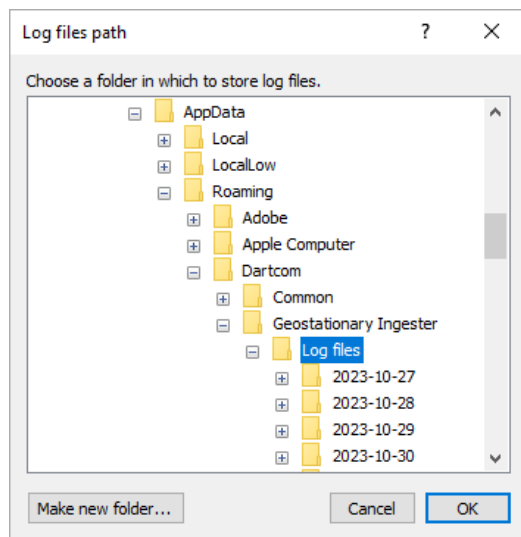


## Activity logging

If you want the Geostationary Ingester software to record log files describing its activities, switch on **Log activity**. If switched on, separate log files are recorded for the main program (*Dartcom Geostationary Ingester.log*) and each of the ingesters (*EUMETCast LRIT.log* and *GOES HRIT.log*, for example).

By default, log files are stored in a folder called **Log files** within the user's application data folder. However, if you would like to change this path, click **Choose...**. The **Log files path** window (figure 2.3) is displayed.

**Figure 2.3**  
The **Log files path** window



Select the required folder, then click **OK**. To create a new folder, select the folder in which you would like to create the new one, then click **Make new folder...**. Enter a name for the new folder in the window which appears, then click **OK**. The new folder is then selected automatically, so just click **OK** again to return to the **Diagnostics settings** window.

New log files are started automatically at midnight each day. To delete previous log files after a period of time (recommended) switch on **Delete files** and enter the required

number of days in the box, or use the  buttons to adjust it. The minimum is 2 days and the maximum 366.

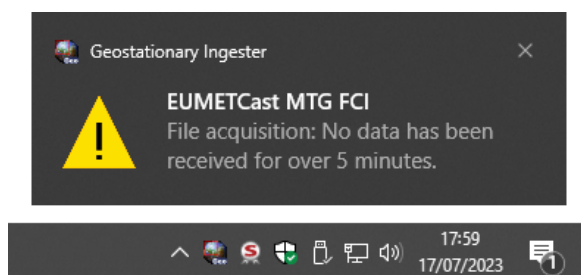
To view the current and archived log files in Windows Explorer, click **Show log files**.

### Alarms

In addition to logging activity, the Geostationary Ingestor software generates alarms for certain events. They are displayed in the **Alarms** window (see **Alarms button**), or if the software is minimised critical alarms are displayed as system notifications, an example of which is shown in figure 2.4.

**Figure 2.4**

An example of a system notification for an event



Alarms can also be sent by email for remote monitoring and diagnostics purposes. Table 2.2 shows the events which cause an alarm to be generated.

**Table 2.2**

Events which cause an alarm to be generated

Category	Event	Type
System	Time changed	Information
	Computer shut down	Significant
Program	Software started or closed	Significant
	Settings changed	Information
	Activity logging switched on or off	Information
	Email alarms switched off	Information
	Email alarms address changed	Information
	Software locked or unlocked	Information
Ingesters	Ingestor started, stopped, paused or resumed manually	Significant
	New type of product received	Information
	Problem with receiver	Critical
	Data processing or output error	Critical
	Archiving error	Critical
	Low available storage space	Critical
	No data received for a pre-configured amount of time	Critical

To enable the sending of email alarms, switch on **Send email alarms**. Choose the types of alarm you want to receive using the **Information** and **Significant** tick boxes. The **Critical** tick box cannot be switched off because alarms for critical events are always sent.

Enter the destination email address for alarms in the **To** box. Multiple addresses can be entered if required, separated by commas. Enter an email address which identifies the PC running the Geostationary Ingestor software in the **From** box. Enter the host name or IP address of an available SMTP server (or mail relay) in the **SMTP host** box.



**For alarms to be sent via email, the specified SMTP server must be available on your network or via your internet connection at all times. If the server is not available, the software will not be able to send email alarms.**

If your SMTP server requires a non-standard port number, enter it in the **Port** box (25 is the default). If your SMTP server requires authentication, switch on **Authenticate** and enter a valid user name and password in the **User** and **Password** boxes respectively.

**Monitoring**

An alarm will be generated in the event that the available space in any of the archive or output paths becomes low. Enter the amount of space at which to send an alarm in the **Minimum available space** box, or use the buttons to adjust it. The minimum is 100MB and the maximum 10000MB (10GB).

An alarm will also be generated if one of the ingesters receives no data for a particular amount of time (assuming this alarm has not been disabled). Enter the time to wait before sending alarm in the **Minimum time without data** box, or use the buttons to adjust it. The minimum is 5 minutes and the maximum 1440 minutes (24 hours).



**Alarms button**

This button shows or hides the **Alarms** window (figure 2.5). When the window is visible, click this button to hide it, or simply close the window.

**Figure 2.5**  
The **Alarms** window

Alarms		
Date and time	Source	Event
2023-07-18 15:10:37	GOES HRIT	The GOES HRIT ingester settings have been changed.
2023-07-18 15:10:38	GOES HRIT	The GOES HRIT ingester has been started manually.
2023-07-18 15:12:41	EUMETCast MTG FCI	File acquisition: Data has been received again after a break of over 27 minutes.
2023-07-18 15:14:03	EUMETCast HRIT	File acquisition: No data has been received for over 5 minutes.
2023-07-18 15:14:31	EUMETCast HRIT	File acquisition: Data has been received again after a break of over 6 minutes.
2023-07-18 15:14:51	Dartcom Geostationar...	The diagnostics settings have been changed.

The **Alarms** window contains a list of the alarms which have occurred since the software was started, listed in chronological order with the oldest first. There are three types of alarm, indicated by the icons in the **Date and time** column, described below.

- Information** – Events not normally requiring user intervention.
- Significant** – Significant events that require non-urgent user intervention.
- Critical** – Critical events that require urgent user intervention.

The **Source** column shows which ingester generated the alarm for ingester events, or **Dartcom Geostationary Ingestor** for system and program events (see table 2.2).

The details of the alarm are shown in the **Event** column. You can resize the window and table columns if the event description is too long to fit in the table.

To remove an alarm from the list, select it and click **Clear selected**. Hold down the **Ctrl** key to select multiple alarms or the **Shift** key to select all alarms between two times. To remove all the alarms in the list, click **Clear all**.

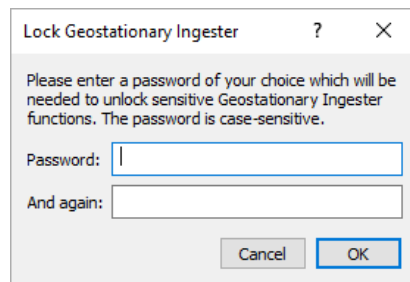
## Lock... button

The **Lock...** button allows the software to be protected from unauthorised tampering. When locked, the ingesters cannot be controlled manually nor configured, the diagnostics settings cannot be changed and the software cannot be closed.

### Locking the software

Click **Lock...** to display the **Lock Geostationary Ingestor** window (figure 2.6).

**Figure 2.6**  
The **Lock Geostationary Ingestor** window



Enter a suitable password in the **Password** box. The password is concealed on the screen by asterisks to prevent others from seeing it.




**The password is case-sensitive, which means that upper-case letters are treated as being different to their lower-case equivalents (for example 'A' is not the same as 'a').**



**Make a note of the password entered, as it will need to be entered again to unlock the software. There is no direct way to unlock the software other than by re-entering the password used to lock it. If you forget the password, you will have to contact Dartcom for technical support.**

Type the password again in the **And again** box, exactly as it was typed in the **Password** box. Click **OK** to lock the software, or **Cancel** if you don't want to lock it.

If the passwords in the **Password** and **And again** boxes matched, the software will now be locked, indicated by the  icon at the bottom of the window and the **Lock...** button changing to **Unlock....** If the passwords did not match, a window appears informing you of this. Re-type the password in both boxes, then click **OK** again.

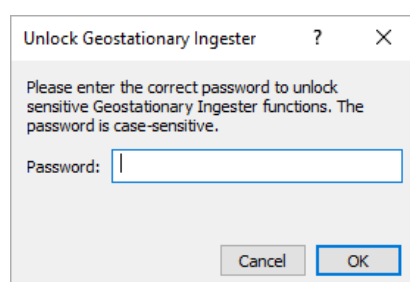
## Unlock... button


The **Unlock...** button unlocks the software to allow the ingesters to be controlled and configured manually, the diagnostics settings changed and the software closed.

### Unlocking the software

Click **Unlock...** to display the **Unlock Geostationary Ingestor** window (figure 2.7).

**Figure 2.7**  
The **Unlock Geostationary Ingestor** window



Type the password which you used to lock the software in the **Password** box, remembering that it is case-sensitive. Click **OK** to unlock the software, or **Cancel** if you don't want to unlock it. If the password you typed in the **Password** box matches the password which was used to lock the software, it will now be unlocked, indicated by the  icon at the bottom of the window and the **Unlock...** button changing to **Lock...**

If the passwords did not match, a window appears informing you of this. Re-type the correct password, then click **OK** again.

## Access buttons

The **Access** buttons allow the current level of access to the software to be set. At present this only affects the **Calibration...** button in the **Reception** tab of each ingester, which is only available with **Advanced** or **Engineer** access.

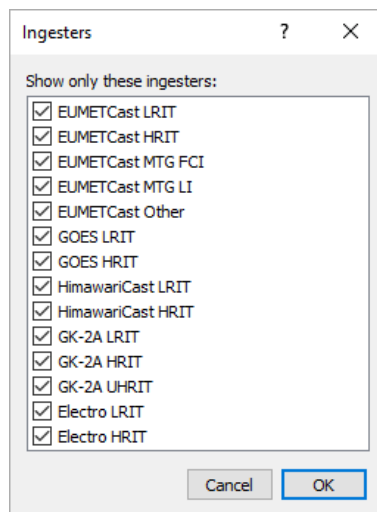
To prevent unauthorised tampering a password is required to enter the **Advanced** and **Engineer** access levels. **Advanced** access is intended for use only by trained maintenance personnel. The password is therefore published in the *Second Line Maintenance* manual supplied with your system (if applicable).

**Engineer** access is normally reserved for Dartcom engineers only. Should it be necessary for the customer to enable **Engineer** access, Dartcom will provide the password.

## Ingesters... button

The **Ingesters...** button allows the range of visible ingesters to be configured, so ingesters that are not being used can be hidden. The **Ingesters** window (figure 2.8) is displayed.

**Figure 2.8**  
The **Ingesters** window



Tick or untick the ingesters as required, then click **OK**. Any ingesters that are unticked will be stopped if they are currently visible.

## Exit button

To close the Geostationary Ingester software, click **Exit**.



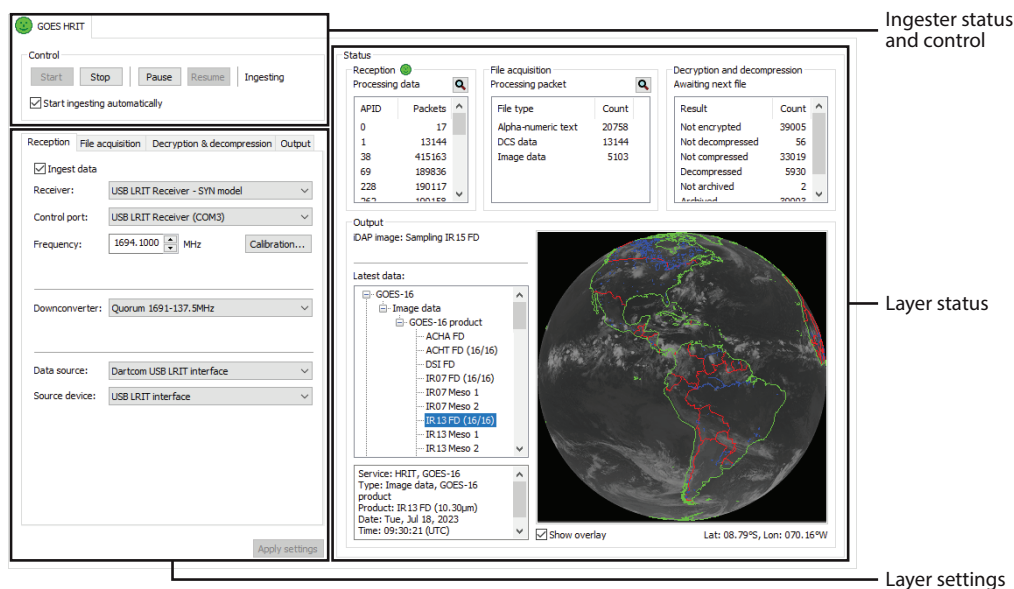
**The software cannot be closed if it has been locked. To unlock it, click **Unlock...** and enter the correct password (see *Unlocking the software* above).**

## Ingester tabs

Each ingester has an associated tab which allows it to be configured, controlled and monitored. As explained earlier in this section, all the ingester tabs have a very similar layout. This general layout is described below, covering all ingesters to avoid duplication. Notes in the margin identify items which apply only to a particular ingester.

Figure 2.9 shows an example of an ingester tab and describes its layout.

**Figure 2.9**  
The layout of an ingester tab



Ingester status and control

Layer status

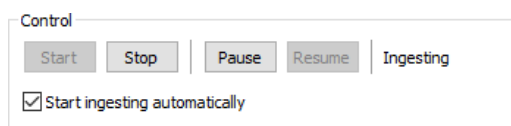
Layer settings

Its controls can be split into three main groups: *ingest status and control*, *layer settings* and *layer status*. The controls within each of these are described below in that order.

### Control area

The **Control** area (shown in figure 2.10) allows the ingester to be started, stopped, paused and resumed.

**Figure 2.10**  
The **Control** area of an ingester tab



It also shows the overall status of the ingester in conjunction with the round status icon next to the tab's title. The various icon states are described below.



**Red** – Ingester is stopped.



**Yellow** – Ingester is starting, paused or resuming.



**Green, spinning** – Ingester is running.

To start the ingester, click **Start**. The status icon will change briefly from red to yellow, then change from yellow to green and start spinning.

To pause the ingester, click **Pause**. The status icon will change from green to yellow after a few seconds. Pausing the ingester temporarily stops processing without losing any data currently in the processing chain. To start processing again if the ingester is paused, click **Resume**. The status icon will change from yellow to green and start spinning.

To stop the ingester, click **Stop**. The status icon will change to red after a few seconds.



**If you stop an ingester, any data currently in the processing chain may be lost. If you just want to stop processing temporarily, click Pause instead.**

If you would like the ingester to begin processing data without having to start it manually each time you start the Geostationary Ingester software, switch on **Start ingesting automatically** when software is opened.

## Reception tab

The **Reception** tab (shown in figure 2.11) allows the reception (or *data link*) layer settings to be configured. These include the receiver, downconverter and data source settings.



**For DVB ingesters (such as EUMETCast and HimawariCast) data is assembled into files by external DVB acquisition software. The reception layer of the Geostationary Ingester software is therefore not used and has no associated settings.**

**Figure 2.11**  
The **Reception** tab

The screenshot shows the 'Reception' tab of the software interface. It contains the following settings:

- Ingest data:** A checkbox that is checked.
- Receiver:** A dropdown menu set to 'USB LRIT Receiver - SYN model'.
- Control port:** A dropdown menu set to 'USB LRIT Receiver (COM3)'.
- Frequency:** A numeric input field set to '1694.1000' with a unit dropdown set to 'MHz'. A 'Calibration...' button is next to it.
- Downconverter:** A dropdown menu set to 'Quorum 1691-137.5MHz'.
- Data source:** A dropdown menu set to 'Dartcom USB LRIT interface'.
- Source device:** A dropdown menu set to 'USB LRIT interface'.



**After changing any of the reception layer settings, click the Apply settings button (below the tabs) to make your changes take effect.**




**If your receiver is disconnected or switched off during ingest, reconnect it and switch it on, wait for it to be detected and automatically reselected by the software, then click the Apply settings button. Ingest should then resume.**

**Ingest data** should normally be switched on so live data is ingested from the data source. It should only be switched off if you are acquiring files from an external source.

Select the type of receiver connected to your system using the **Receiver** drop-list. If it is a USB LRIT Receiver, a label on the back panel shows the model.

If the selected receiver type uses serial control, choose the appropriate serial port using the **Control port** drop-list. Or if it uses TCP/IP control, enter the appropriate host name or IP address in the **Host** box and the control port number in the **Port** box.



If the selected receiver is tuneable, enter the required frequency in the **Frequency** box, or adjust it using the  buttons. If it has a configurable signal display, select the required format using the **Signal display** drop-list.

The **Calibration...** button is only available with **Advanced** or **Engineer** access. It is for use by trained maintenance personnel or Dartcom engineers only and is therefore covered in the *Second Line Maintenance* manual supplied with your system (if applicable).

Select the type of downconverter fitted to your antenna using the **Downconverter** drop-list. The range available depends on the selected receiver.

If the selected downconverter type uses serial communications, select the appropriate serial port using the **Control port** drop-list.

Select the source for ingested data using the **Data source** drop-list. For USB data sources, select the device from which to ingest data using the **Source device** drop-list. The list is dynamically updated as devices are added and removed, so if your device is not listed, ensure the USB cable is connected and the device is switched on, then check the list again.

### TCP/IP stream data sources

If the **TCP/IP stream** data source is selected, the controls change as shown in figure 2.12.

**Figure 2.12**  
TCP/IP stream data  
source settings



Role: ☒ Client ☐ Server

Server host:

TCP port:

TCP/IP streams have a client-server relationship, analogous a telephone conversation. The client host has to make a connection to the server host before data will flow.

Select the role to be taken by the ingester using the **Role** radio buttons. **Client** attempts to connect to a server host. **Server** listens for an incoming connection request from a client host, and only allows one client at a time to be connected.

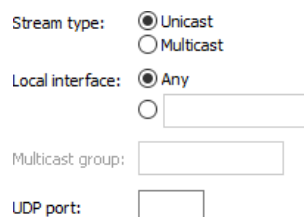
If **Client** is selected, enter the server host name or IP address in the **Server host** box, and the TCP port number to which to connect in the **TCP port** box.

If **Server** is selected, enter the TCP port number on which to listen for client connections in the **TCP port** box.

### UDP/IP stream data sources

If the **UDP/IP stream** data source is selected, the controls change as shown in figure 2.13.

**Figure 2.13**  
UDP/IP stream data  
source settings



Stream type: ☒ Unicast ☐ Multicast

Local interface: ☒ Any

Multicast group:

UDP port:

UDP/IP streams are connectionless, analogous to a broadcast radio station. Data flows from the source host all the time, and the client host simply “listens in” when required.

Select the type of UDP/IP stream being output by the data source. **Unicast** is when data is only being transmitted to a single host. **Multicast** is when data is being transmitted to a group of hosts that have subscribed to receive it.



Select the local network interface on which to listen for data. **Any** will listen on all interfaces simultaneously, or you can enter the IP address of a specific interface to listen on. We recommend choosing this option and connecting the data source to its own dedicated network interface. This ensures no pollution of the data by other hosts.

If **Multicast** is selected, enter the IP address of the multicast group to which to subscribe in the **Multicast group** box. Only valid multicast addresses will be accepted.

Enter the UDP port number on which to listen for data in the **UDP port** box.

## File acquisition tab

The **File acquisition** tab (shown in figure 2.14) allows the file acquisition (or *transport*) layer settings to be configured. These include archiving of raw files and filtering of files based on their type.

**Figure 2.14**  
The **File acquisition** tab



**After changing any of the file acquisition layer settings, click the Apply settings button (below the tabs) to make your changes take effect.**

### L-Band and UHRIT ingesters

To process files received from the reception layer, switch on **Acquire files**. If **Acquire files** is switched off, data received from the reception layer will be discarded and not submitted to the decryption and decompression layer for further processing.

Normally data is ingested by the reception layer and forwarded automatically to the file acquisition layer. Pre-ingested files can also (or instead) be acquired from an external source by switching on **Look for files** and clicking **Choose...** to select the source folder in the **Source file path** window which appears (similar to that shown in figure 2.3).

### DVB ingesters

To process files output by DVB acquisition software, switch on **Acquire files**.




**If **Acquire files** is switched off, files output by DVB acquisition software will not be deleted by the ingester. This will eventually lead to all available storage being used.**

Set the **Look for files in** path to the folder in which the DVB acquisition software is outputting files. To do this, click **Choose...** and select the required folder in the **DVB software output path** window which appears (similar to that shown in figure 2.3).

### Raw file archiving

If you would like acquired files to be archived in their raw, unprocessed state, switch on **Archive acquired files**. This archive can be used to feed external acquisition software if required.

Set the folder in which to archive acquired files by clicking **Choose...** and selecting the required folder in the **Acquired files archive path** window which appears (similar to that shown in figure 2.3). The files are stored directly in the specified folder, with no additional sub-folder structure.

To delete archived files when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of hours in the box, or adjust it using the  buttons. The minimum is 1 hour and the maximum 168 (7 days).





**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

### Filtering

LRIT, HRIT, UHRIT and MTG data provides a wide range of different product types for different purposes. If you are not interested in some of these products, you can filter them out of the processing chain at this stage. Four levels of filtering are provided:

- All files from a particular service (such as *MSG* or *GOES-16*).
- All files of a particular type (such as GTS message or alpha-numeric text).
- All files of a particular data type (such as *MSG2\_RSS* or *NWS product*).
- Individual products (such as *VIS006* or *USA\_latest*).

If you want to filter acquired files in this way, switch on **Process only these file types**. The tree control below it contains all received services at its top level. Use the  and  buttons to expand and collapse the tree to see the file types, data types and products hierarchy for each service.



**The range of services, file types, data types and products listed in the filters tree reflects the range of those ingested to date. When the software is first used it will be empty. We therefore recommend leaving the software ingesting for 24 hours with filtering switched off to ensure that the full range of products is available.**

Use the check-boxes to select which services, file types, data types and products should be processed. If you switch off a service, all files received from it will be discarded, regardless of whether or not any of its file types, data types or products are switched on. For example, if you switch off **MSG**, all files received from the *MSG* service will be discarded.

If you switch off a file type, all files of that type received from its parent service will be discarded, regardless of whether or not any of its data types or products are switched on. For example, if you switch off **MSG1: GTS message**, all GTS messages received from the *MSG1* service will be discarded.

If you switch off a data type, all files of that type of its parent file type will be discarded, regardless of whether or not any of its products are switched on. For example, if you switch off **MSG2: Image data: MSG2\_RSS**, all *MSG2\_RSS* image data files received from the *MSG2* service will be discarded.



**If the Process only these file types check-box is switched off, all files will always be processed regardless of your selections in the tree.**

To remove all services, file types, data types and products from the list and rebuild it as new files are received, click **Clear file types**. You only need to do this if the list contains many products which are no longer transmitted.

If you want processing of previously unseen services, file types, data types and products to be switched on automatically, switch on **Process new file types by default**. If you would prefer them to be filtered out of the processing chain by default, switch it off. In this case, you can switch them on manually as required.

### “No data” alarms

If the **Alarm if maximum time without data exceeded** check-box is ticked, an alarm will be generated if the ingester does not receive any new data for the period specified in the **Diagnostics settings** window. If the box is not ticked, no alarm will be generated.

## Decryption & decompression tab

The **Decryption & decompression** tab (shown in figure 2.15) allows the decryption and decompression (or *session*) layer settings to be configured. These include ingester-specific decryption settings and archiving of files before and after decompression.

**Figure 2.15**  
The **Decryption & decompression** tab



**After changing any of the decryption and decompression layer settings, click the Apply settings button (below the tabs) to make your changes take effect.**

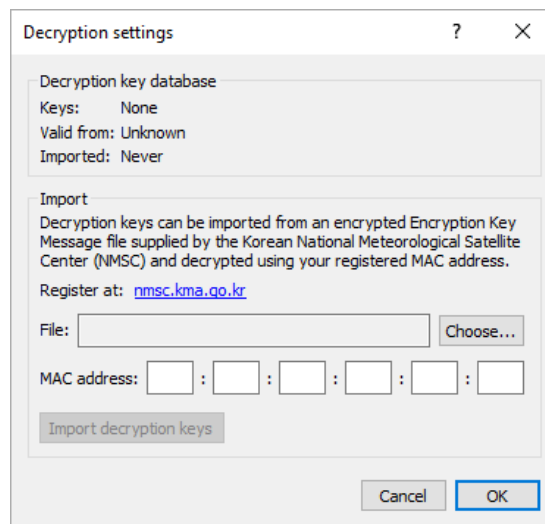
To decrypt and decompress files received from the file acquisition layer, switch on **Decrypt and decompress files**. Files are only decrypted if they are encrypted, and only

decompressed if they are compressed. Unencrypted and uncompressed files pass through this layer unchanged.

If **Decrypt and decompress files** is switched off, files received from the file acquisition layer will be discarded and not submitted to the output layer for further processing.

For GK-2A ingesters, click **Decryption settings...** to update the current decryption keys. The **Decryption settings** window (figure 2.16) is displayed and allows new keys to be imported from a file and decrypted using a corresponding MAC address.

**Figure 2.16**  
The **Decryption**  
**settings** window



### Pre-decompression archiving

If you would like files to be archived before they are decompressed, switch on **Before decompression, archive files**. This will archive all decrypted files, whether or not they are compressed.

Set the archive path by clicking **Choose...** and selecting the required folder in the **Pre-decompression archive path** window which appears (similar to that shown in figure 2.3). The files are stored directly in the specified folder, with no additional sub-folder structure.

To delete archived files when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of hours in the box, or adjust it using the buttons. The minimum is 1 hour and the maximum 168 (7 days).



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

### Post-decompression archiving

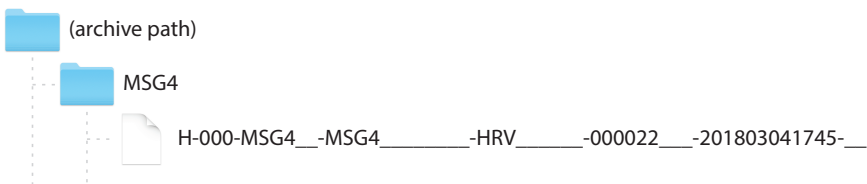
If you would like files to be archived after decryption and decompression, switch on **Archive processed files**.

Different archiving settings can be specified for each file type (such as alpha-numeric text or image data). Choose the type to configure using the **Settings for** drop-list. If you want to use the selected file type's archiving settings for all other types, click **Use for all**. This will copy the current settings to all the other top-level file types.

Switch on **Archive** if you want files of the selected type to be archived. Set the archive path by clicking **Choose...** and selecting the required folder in the window which appears (similar to that shown in figure 2.3).

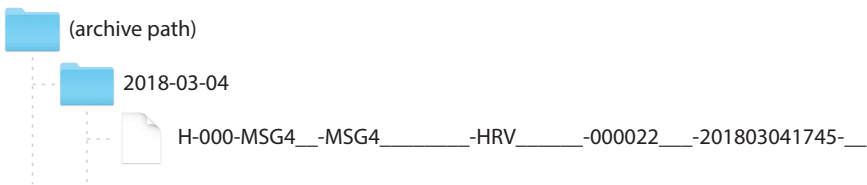
A number of grouping options can be specified if required. To store files in folders corresponding to their type and data type, switch on **By type**. Figure 2.17 shows an example of how an *MSG4* image data file would be stored in this way within the archive.

**Figure 2.17**  
An example of archiving by type



To store files in folders corresponding to their date of acquisition by the satellite (UTC), switch on **By date**. Figure 2.18 shows an example of how an *MSG4* file acquired on March 4th, 2018 would be stored in this way within the archive.

**Figure 2.18**  
An example of archiving by date



If **By type** and **By date** are both switched on, the dated folders are stored within each data type folder. Figure 2.19 shows how the same file would be stored in this way.

**Figure 2.19**  
An example of archiving by type and date



If **By date** is switched on, to store files in folders corresponding to their time of acquisition by the satellite (UTC) as well as by their date, switch on **By time**. Figure 2.20 shows an example of how an *MSG4* file acquired at 17:45 UTC on March 4th, 2018 would be stored in this way within the archive.

**Figure 2.20**  
An example of archiving by date and time

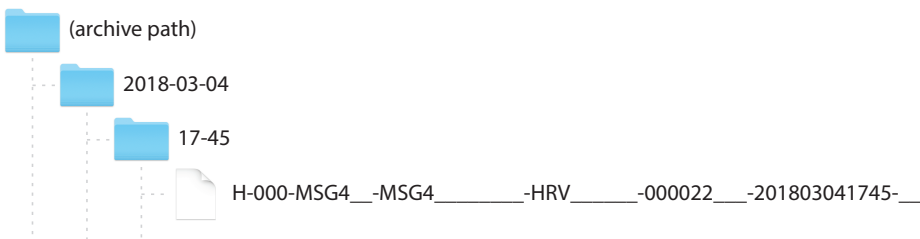
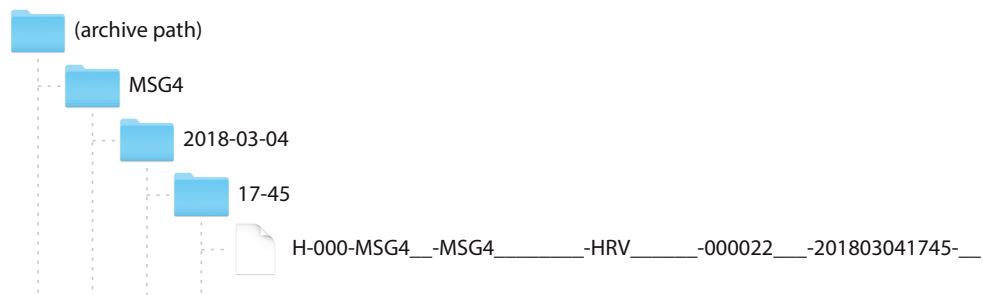


Figure 2.21 shows how the same file would be stored if **By type**, **By date** and **By time** are all switched on.

**Figure 2.21**

An example of archiving  
by type, date and time



To delete archived files when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

### Data extraction and archiving

If you would like the raw data to be extracted from processed files and archived, switch on **Extract data from files and archive**. Each extracted data file will be saved using its original name with an appropriate file extension appended. This archive can be used to feed external data processing software if required, such as the Weather Message EMWIN software for processing GOES HRIT/EMWIN data.

Set the archive path by clicking **Choose...** and selecting the required folder in the **Extracted data archive path** window which appears (similar to that shown in figure 2.3). The files are stored directly in the specified folder, with no additional sub-folder structure.

To delete archived files when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of hours in the box, or adjust it using the buttons. The minimum is 1 hour and the maximum 168 (7 days).

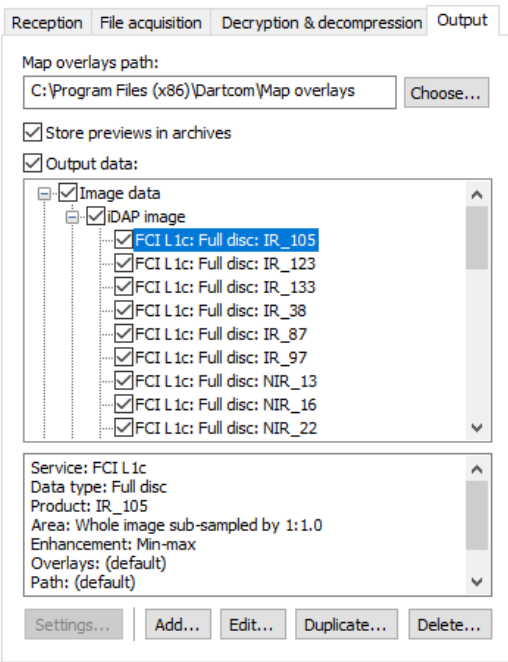


**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

### Output tab

The **Output** tab (shown in figure 2.22) allows the output (or *presentation*) layer settings to be configured. These currently include the map overlay files path, archiving of previews with their associated archived data, and output of data in various formats.

**Figure 2.22**  
The **Output** tab



**After changing any of the output layer settings, click the Apply settings button (below the tabs) to make your changes take effect.**

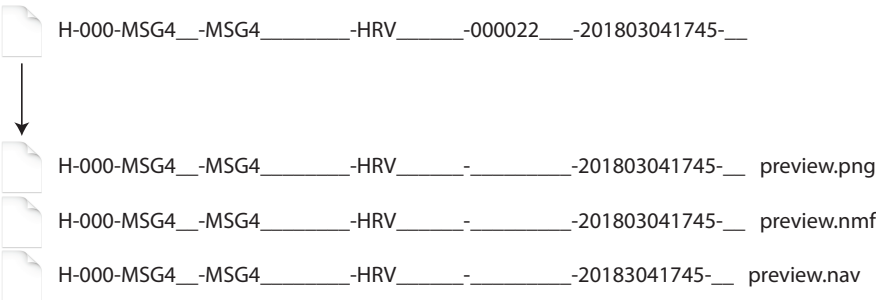
Set the folder in which map overlay files are located by clicking **Choose...** and selecting the required folder in the **Map overlays path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Program Files (x86)\Dartcom\Map overlays* (see figure 1.2). The files are used to create map overlays for image data previews and iDAP image outputs.

The output layer automatically creates previews of image and alpha-numeric text data for display in the **Status** area (see later in this section). Switch on **Store previews in archives** if you would like them to be stored with their associated archived data (if any).

Image data previews are sub-sampled so that they are no wider than 800 pixels and stored in PNG format (extension *.png*) with overlay meta-file and navigation data files (extensions *.nmf* and *.nav* respectively). Alpha-numeric text previews are stored in ASCII format (extension *.txt*).

Preview files are named according to the names of their associated data files, with the segment number (if any) removed and *preview* (preceded by a space) appended. For example, figure 2.23 shows what the preview file name would be for an *MSG4 HRV* image segment file acquired at 17:45 UTC on March 4th, 2018.

**Figure 2.23**  
An example of  
preview file naming






### Data output

If you want to output ingested data to other software (such as the Dartcom iDAP or MacroPro viewing and processing software) or in formats other than the standard raw, switch on **Output data**.

The tree control below it contains all file types whose data can be output at its top level. For each file type there are one or more *formats* (such as **Email** or **iDAP image**). Each format can have any number of user-defined *outputs*, each of which handles one or more products (such as *ADMIN* or *IR15 FD*) of a particular data type (such as *SERVICE* or *GOES-16 product*) received from a particular service (such as *MSG1* or *GOES-16*).

Use the  and  buttons to expand and collapse the tree to see the formats and outputs for each file type.

Use the check-boxes to select which file types, formats and outputs should be processed. If you switch off a file type, no files of that type will be output, regardless of whether or not any of its associated formats or outputs are switched on. For example, if you switch off **Image data**, no image data files will be output.

If you switch off a format, none of its associated outputs will be processed, regardless of whether or not they are switched on. For example, if you switch off **Image data: iDAP image**, no iDAP image outputs will be produced.

Below the tree control is a row of buttons. **Settings...** is only available if a format is selected, and allows the format's settings (which are common to all its associated outputs) to be configured. **Add...** is only available if a format or output is selected, and adds a new output of the corresponding format. **Edit...**, **Duplicate...** and **Delete...** are only available if an output is selected. **Edit...** allows the output's settings to be edited, **Duplicate...** adds a new output of the corresponding format using the selected output as a basis, and **Delete...** deletes the selected output.



**You can also right-click a format or output to display a menu allowing the relevant functions above to be applied to it.**

The range of output formats available depends on the ingester. The full range is described in section 3, including how to configure them and add or edit outputs.



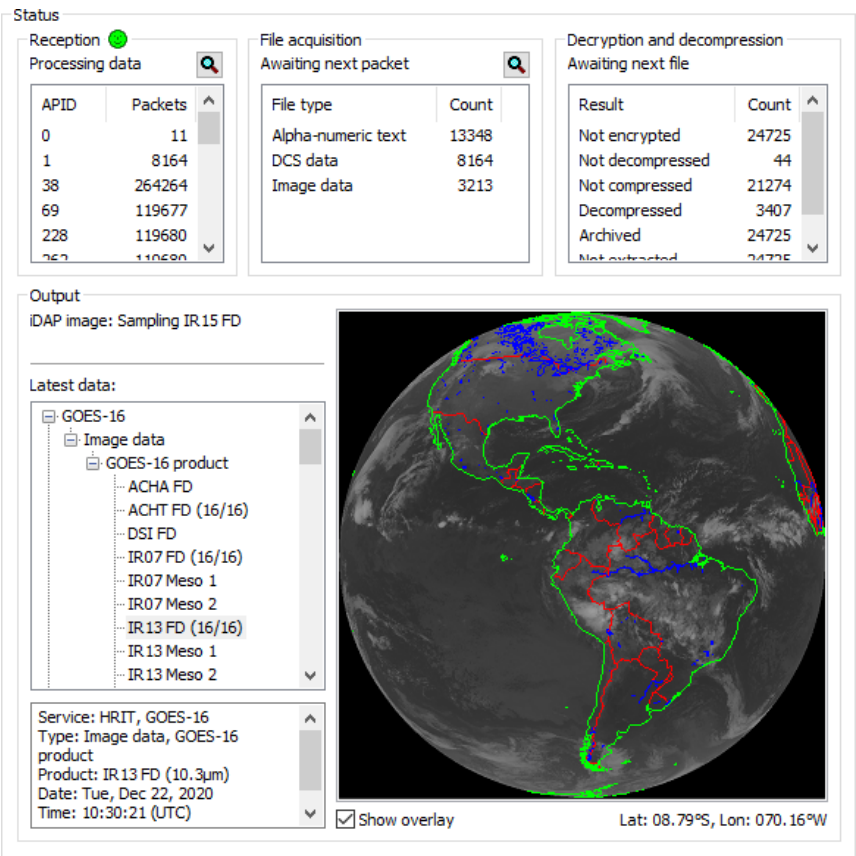
**Before adding any data outputs, we advise leaving the software ingesting data until complete versions of all the products you want to output are shown in the Latest data tree in the Output status area.**

### Status area

The **Status** area (shown in figure 2.24) displays status information for each of the four ingester layers.




**Figure 2.24**  
The **Status** area



### Reception area


The **Reception** area shows the status of the reception (or *data link*) layer. The message at the top shows what the layer is currently doing.





**For DVB ingesters (such as EUMETCast and HimawariCast) data is assembled into files by external DVB acquisition software. The reception layer of the Geostationary Ingestor software is therefore not used, so the frame synchronisation icon,  button and packet counts in the Reception area are not displayed.**

The icon at the top shows whether or not frame synchronisation has been achieved. The icon states are described below.

 **Not frame synchronised** – The satellite signal is very noisy or non-existent.

 **Frame synchronised** – The satellite signal is good.

The table shows how many packets have been received for each application process (APID). The counts are reset to zero at midnight each day.

The  (detailed reception status) button shows or hides the **Reception status** window (figure 2.25). When the window is visible, click the  button to hide it or simply close the window.


**Figure 2.25**  
The **Reception status** window

VCID	Frames	Sequence errors	Packets	Packet errors
0	27	0	9	0
1	50571	0	207207	4
2	37269	0	92480	0
7	158494	0	92480	8
8	85952	0	92480	0
9	95003	1	92478	7
13	147735	0	92480	6
14	149496	0	92480	6
15	145628	0	92480	6
17	25797	0	24552	2
20	11887	0	5732	8
21	53144	0	5768	0
22	18046	0	4230	8
24	2083	0	238	0

The figures in the top part of the window show various counts collected by the reception layer and are self-explanatory. They are reset to zero at midnight each day.

The icon on the left shows whether or not frame synchronisation has been achieved. The icon states are described below.

 **Not frame synchronised** – The satellite signal is very noisy or non-existent.

 **Frame synchronised** – The satellite signal is good.



The table in the bottom left corner shows various counts collected by the reception layer for each virtual channel (VCID) in the data stream. The table columns are self-explanatory. The counts are reset to zero at midnight each day.

The **Receiver status** box shows the last status obtained from the receiver (if any). To get the latest receiver status, click **Update**. To copy the current status to the clipboard (for pasting into a technical support request, for example) click **Copy**.

### File acquisition area

The **File acquisition** area shows the status of the file acquisition (or *transport*) layer. The message at the top shows what the layer is currently doing.

The table shows how many files of each type have been received. The counts are reset to zero at midnight each day.

The  (detailed file acquisition status) button shows or hides the **File acquisition status** window (figure 2.26). When the window is visible, click the  button to hide it or simply close the window.

**Figure 2.26**  
The **File acquisition status** window

APID	File ID	Size (bytes)	Complete	Bytes received	Packets	Sequence errors	CRC errors	Decomp. errors
0	54133	1887	100.0%	1887	1	0	0	0
1	55844	7991	100.0%	7991	1	0	0	0
38	55565	255106	100.0%	255106	501	0	0	0
69	54750	1843542	100.0%	1843542	340	0	0	0
228	55775	1844008	100.0%	1844008	340	0	0	0
262	54809	1844008	100.0%	1844008	340	0	0	0
294	54861	1844008	100.0%	1844008	340	0	0	0
420	55837	1843998	56.2%	1035822	191	0	0	0
454	54969	1844005	100.0%	1844005	340	0	0	0
486	55080	1844006	100.0%	1844006	340	0	0	0
552	55280	463591	100.0%	463591	170	0	0	0
641	55832	1946	100.0%	1946	1	0	0	0
642	55839	723	100.0%	723	1	0	0	0
677	55841	84944	19.3%	16370	2	0	0	0
707	55846	2534	100.0%	2534	1	0	0	0
708	53409	3356	100.0%	3356	1	0	0	0
776	55295	41569	100.0%	41569	6	0	0	0
803	55707	1184495	100.0%	1184495	1087	0	0	0
807	55518	1844008	100.0%	1844008	340	0	0	0

The table shows various counts collected by the reception layer for the last file received for each application process (APID) in the data stream. The table columns are self-explanatory. The counts are reset to zero at midnight each day.

### Decryption and decompression area

The **Decryption and decompression** area shows the status of the decryption and decompression (or *session*) layer. The message at the top shows what the layer is currently doing.

The table shows the counts of each result from the decryption, decompression, data extraction and archiving processes. They are reset to zero at midnight each day. The details of any decryption, decompression, archiving or extraction errors can be found in the ingester's log file if activity logging is switched on (see **Diagnostics...** button earlier in this section).

### Output area

The **Output** area shows the status of the output (or *presentation*) layer. The message in the upper left corner shows what the layer is currently doing.

The **Latest data** tree shows the range of different products which have been acquired since the Geostationary Ingester software was started, or are currently being acquired. They are organised hierarchically by service, file type and data type. Use the **+** and **-** buttons to expand and collapse the tree to see the file types, data types and products for each service.

For segmented products, the number of segments acquired so far and the total number which comprise the complete product are shown in brackets. For example, (5/8) means that five of the eight segments of the product have been acquired.

Select a product in the tree to view its details and preview (if available). The details are shown below the **Latest data** tree. **Service** is the channel (such as *LRIT* or *HRIT*) and service (such as *MSG1* or *GOES-16*) from which the product was received. **Type** is the top-level file type (such as image data). **Product** is the name of the product (such as *VIS006*). **Date** and **Time** are in UTC and have different interpretations depending upon the product – please refer to the service provider's documentation.

For segmented products, **Segments** shows how many segments have been acquired of the total number which comprise the complete product, followed by a list of the acquired segment numbers.

The selected product's preview is displayed in the large box to the right of the tree. Image previews are scaled to fit the box so are not full-resolution. Use the **Show overlay** checkbox to show or hide the preview's overlay (if any). Move the mouse over the preview to obtain latitude and longitude read-outs (if available).

Alpha-numeric text previews can be copied to the clipboard by selecting the text, clicking the right mouse button in the preview box and selecting **Copy**. The same applies to the text in the product details box.

If a more recent version of the selected product is acquired, its details and preview are updated automatically, so the latest version is always displayed. For segmented products, the details and preview are updated each time a new segment is acquired, so you can see the image building up segment-by-segment.

# 3

## Outputs reference

### Introduction

This section describes each of the outputs from the Geostationary Ingester software, including how to configure the settings and add or edit associated outputs in the **Output** tab of each ingester.

### iDAP image outputs

One of the ways in which image data products can be output from the Geostationary Ingester software is as single-plane (greyscale) or multi-plane (false colour) iDAP image documents. These can be processed, animated, exported and printed automatically using the Dartcom MacroPro software, and viewed, manipulated and processed manually using the Dartcom iDAP software.

Each iDAP image output saves a selected area of a particular collection of image data products (such as *MSG1: VIS006* or *GOES-16: IR15 FD*) as an iDAP image document. Single-plane iDAP images are created from one product, and multi-plane images from three products (corresponding to the red, green and blue planes of the image).

Images can be sub-sampled to reduce their size by specifying either a sub-sample factor (such as 1:4) or a required width or height (such as 1000 pixels). The sub-sampled image can be enhanced automatically and map overlays created if required. The resulting iDAP image document can be named manually or automatically, saved to a user-defined path and archived if required.

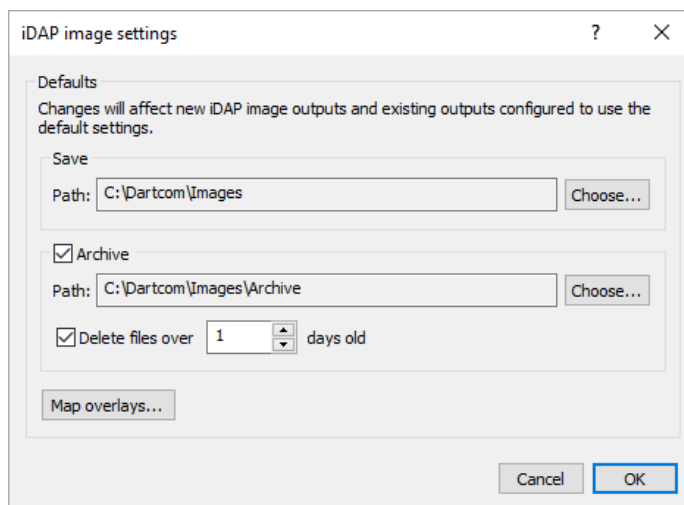
Each plane of an iDAP image has a maximum data resolution of 8 bits, so data of a higher resolution is reduced to 8-bit using a simple shift method.

### Configuring the iDAP image format default settings

The iDAP image format has a number of associated default settings which are used as a basis when adding new iDAP image outputs. To configure them, select **iDAP image** in

the outputs tree, then click **Settings...** (below the tree). The **iDAP image settings** window (figure 3.1) is displayed.

**Figure 3.1**  
The **iDAP image settings** window




### Save area

In the **Save** area, set the default path in which to save iDAP images by clicking **Choose...** and selecting the required folder in the **Default output path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images*.

### Archive area

If you want saved iDAP images to be archived by default, switch on **Archive**. Set the default archive path by clicking **Choose...** and selecting the required folder in the **Default archive path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images\Archive*.

To delete archived iDAP images by default when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

Set the default map overlay settings by clicking **Map overlays....** The **Default overlay settings** window (figure 3.2) is displayed.

**Figure 3.2**  
The **Default overlay settings** window

Default overlay settings

☒ Create overlays

**Grid lines**

☒ Major Spacing: 10.0° Colour: Yellow Style: Solid Width: Thin

☐ Minor Spacing: 2.5° Colour: Olive Style: Dash Width: Thin

**Overlays**

✓	No.	Overlay	Colour	Style	Width
<input checked="" type="checkbox"/>	1	GSHHG borders, L1 (national)	Red	Solid	Thin
<input checked="" type="checkbox"/>	2	GSHHG shorelines, L2 (lakes)	Blue	Solid	Thin
<input checked="" type="checkbox"/>	3	GSHHG shorelines, L1 (coastlines)	Green	Solid	Thin
<input checked="" type="checkbox"/>	4	GSHHG shorelines, L3 (lake islands)	Green	Solid	Thin
<input checked="" type="checkbox"/>	5	GSHHG shorelines, L6 (Antarctic grounding line)	Green	Solid	Thin

Add overlay Delete overlay... To top Up Down To bottom

Reset to factory defaults... Cancel OK

Switch on **Create overlays** if you want overlays to be created. In the **Grid lines** area, switch on **Major** and **Minor** to create grid lines. For each type, set the spacing using the **Spacing** drop-list, the colour in which to draw them using the **Colour** picker, the line style using the **Style** drop-list and the line thickness using the **Width** drop-list. Normally the minor grid line spacing should be half that of the major grid lines and they should be drawn using a dashed line.

The **Overlays** list and the row of buttons below it allow overlays to be added, edited and deleted. Overlays are drawn in the listed order, starting at the top, meaning that overlays further down the list may obscure parts of overlays higher up.

For each overlay, switch on its corresponding tick-box if you want it to be visible, select the required overlay using the drop-list in the **Overlay** column, choose the colour using the picker in the **Colour** column, choose the line style using the drop-list in the **Style** column and choose the line thickness using the drop-list in the **Width** column.

To add a new overlay above the currently selected overlay (or at the top of the list if no overlay is selected), click **Add overlay**. To delete an overlay, select it by clicking in its **No.** column, then click **Delete overlay...** (or press the **Del** key).

If you want to change the order of the overlays (because one is obscuring parts of another, for example), select the required overlay by clicking in its **No.** column, then click **To top**, **Up**, **Down** or **To bottom** to move it to the required position in the list.



**You can also right-click an overlay to display a menu allowing the relevant functions above to be applied to it.**

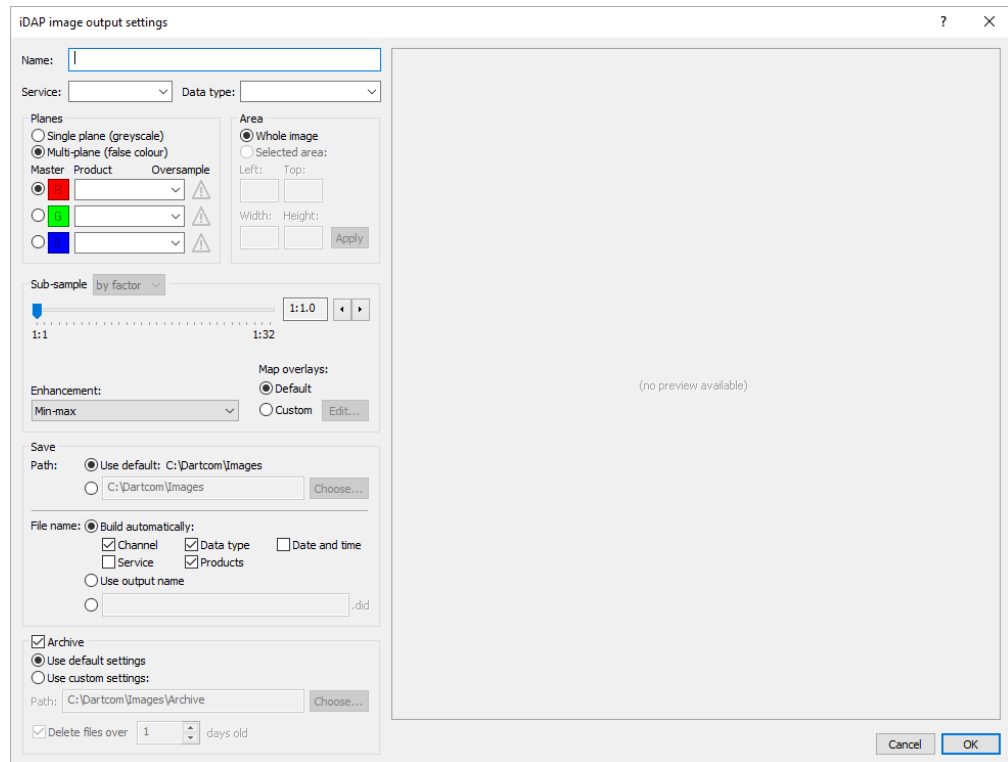
To reset the overlay settings to the original defaults, click **Reset to factory defaults...**

When you are happy with the default overlay settings, click **OK** to save them and return to the **iDAP image settings** window, or click **Cancel** to revert to the previous settings.

## Adding or editing an iDAP image output

To add a new iDAP image output from scratch, select **iDAP image** in the outputs tree and click **Add...** (below the tree). To add a new iDAP image output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing iDAP image output, select it in the tree and click **Edit....** In all these cases, the **iDAP image output settings** window (figure 3.3) is displayed.

**Figure 3.3**  
The **iDAP image output settings** window



If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive (*Europe multi-plane*, for example). If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the products you wish to output are received using the **Service** drop-list, then select the products' data type using the **Data type** drop-list.

### Planes area

In the **Planes** area, select **Single-plane** if you want to create a single-plane (greyscale) iDAP image document from one product, or **Multi-plane** if you want to create a multi-plane (false colour) iDAP image from three products.

For multi-plane images, one of the selected products must be designated as the *master product*. This is the one that you will use to select the required area and which defines the resolution and size of the resulting iDAP image. The other two products are sub-sampled or over-sampled as required to match its resolution.

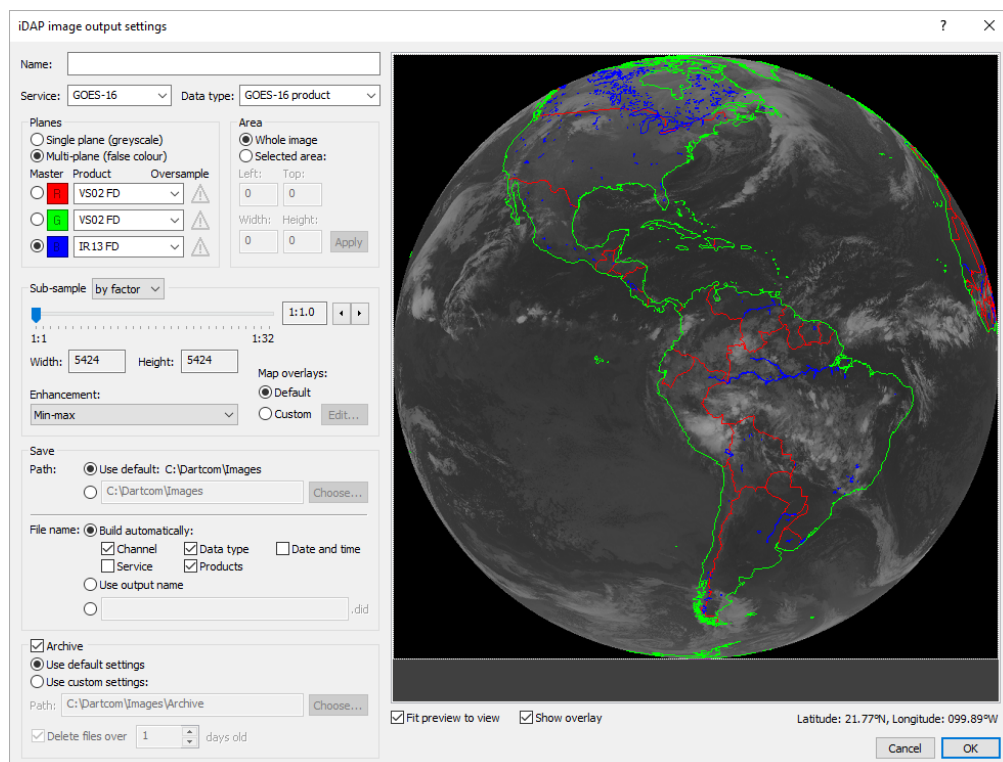
If **Single-plane** is selected, choose the required product using the **Product** drop-list. Because there is only one image plane, it becomes the master product implicitly.

If **Multi-plane** is selected, select the three products to assign to the red, green and blue planes of the resulting image using the corresponding **Product** drop-lists. Select the product you want to designate as the master (see above) using the **Master** radio buttons.



In either case, a preview of the selected master product is displayed on the right-hand side of the window (figure 3.4).

**Figure 3.4**  
The iDAP image output settings window with a product preview displayed



**If the required products have not yet been ingested, you can enter the service, data type and products in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive. Also note that no preview will be displayed and you will be limited to the whole image with sub-sampling by factor only.**

### Area area

In the **Area** area, select **Whole image** if you want to output the entire area of the master product, or select **Selected area** if you want to output only part of it. In the latter case, use the mouse to draw a “rubber band box” (or *marquee*) around the required area on the preview image. The position and size of the selected area (in pixels) are shown in the **Left**, **Top**, **Width** and **Height** boxes respectively. The marquee can be moved by dragging the mouse inside it and resized by dragging the mouse on its edges and corners. As you move the mouse over the marquee, the pointer changes to show how it can be altered.



**If the required area is small and not clearly visible on the preview, switch off the Fit preview to view check-box (below the preview) to view it at its full resolution. Use the Show overlay check-box in the same way if the overlay is obscuring the part of the image in which you are interested.**

Alternatively you can enter the required position and size of the area in the **Left**, **Top**, **Width** and **Height** boxes and click **Apply**.

### Sub-sample area

In the **Sub-sample** area, select the required sub-sampling method using the drop-list. If **by factor** is selected, set the required sub-sample factor using the slider or arrow buttons. The factor is displayed between them. A factor of 1:2 results in an image half its original

size, 1:3 a third its original size, and so on. The size of the resulting image (in pixels) is shown in the **Width** and **Height** boxes below the slider.

If **to size** is selected in the drop-list, the **Sub-sample** area changes as shown in figure 3.5.

**Figure 3.5**

The **Sub-sample** area of the **iDAP image output settings** window (**to size**)

Select whether or not to size the image to a particular width or height using the **Width** and **Height** radio buttons respectively. Enter the required width or height in the appropriate box or use the corresponding buttons to adjust it. Click **Maximum** to set the width or height to the maximum possible for the selected area. The resulting sub-sample factor which will be used to produce the image is displayed in the **Factor** box.

Select the enhancement profile to apply to the resulting image using the **Enhancement** drop-list. The range of profiles and their effects on images are shown in table 3.1.

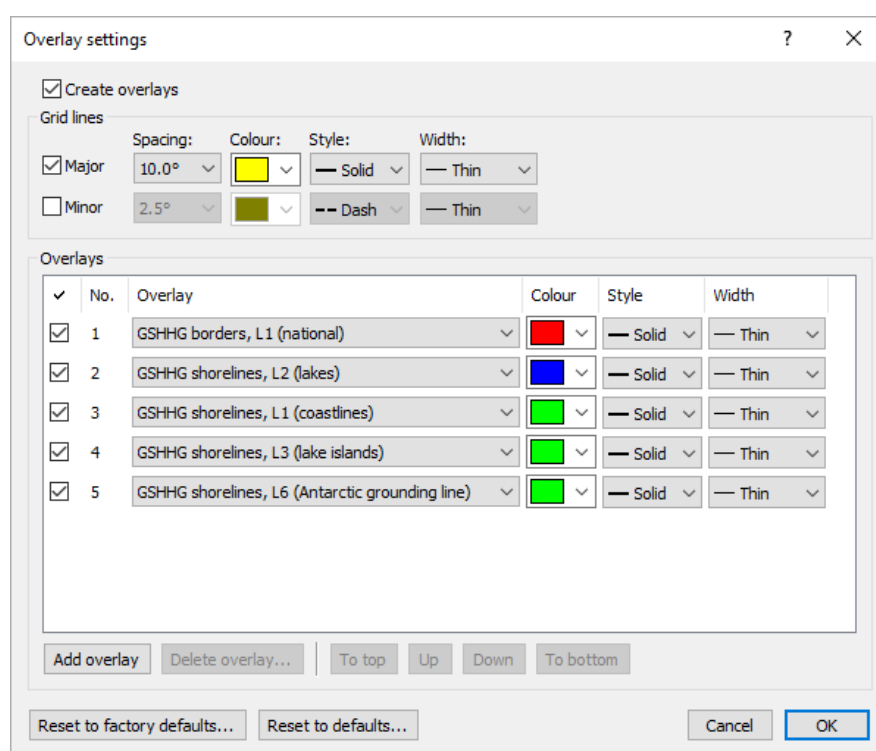
**Table 3.1**

Enhancement profiles, their shapes and effects on images

Profile	Shape	Effect on image
Linear	Straight line ( $y=x$ ) covering all pixel values	No enhancement (pixel values as ingested)
Min-max	Straight line rising between the minimum and maximum pixel values of the histogram	Applies a linear enhancement to pixel values present in the image only
Histogram equalisation	Profile which reflects the shape of the histogram, taking into account peaks in pixel value	Applies optimum levels to pixel values present in the image only
Gaussian	Gaussian (or normal) distribution applied between the minimum and maximum pixel values	Applies levels following a Gaussian distribution to pixel values present in the image only
Sine	Sine curve between the minimum and maximum pixel values	Applies low value biased levels to pixel values present in the image only
Cosine	Vertically-inverted cosine curve between the minimum and maximum pixel values	Applies high value biased levels to pixel values present in the image only

Use the **Map overlays** radio buttons to select whether to use the default map overlay settings (set in the **iDAP image settings** window) or specify custom settings. In the latter case, click **Edit...** to adjust the overlay settings. The **Overlay settings** window (figure 3.6) is displayed.

**Figure 3.6**  
The **Overlay settings**  
window



Switch on **Create overlays** if you want overlays to be created. In the **Grid lines** area, switch on **Major** and **Minor** to create grid lines. For each type, set the spacing using the **Spacing** drop-list, the colour in which to draw them using the **Colour** picker, the line style using the **Style** drop-list and the line thickness using the **Width** drop-list. Normally the minor grid line spacing should be half that of the major grid lines and they should be drawn using a dashed line.

The **Overlays** list and the row of buttons below it allow overlays to be added, edited and deleted. Overlays are drawn in the listed order, starting at the top, meaning that overlays further down the list may obscure parts of overlays higher up.

For each overlay, switch on its corresponding tick-box if you want it to be visible, select the required overlay using the drop-list in the **Overlay** column, choose the colour using the picker in the **Colour** column, choose the line style using the drop-list in the **Style** column and choose the line thickness using the drop-list in the **Width** column.

To add a new overlay above the currently selected overlay (or at the top of the list if no overlay is selected), click **Add overlay**. To delete an overlay, select it by clicking in its **No.** column, then click **Delete overlay...** (or press the **Del** key).

If you want to change the order of the overlays (because one is obscuring parts of another, for example), select the required overlay by clicking in its **No.** column, then click **To top**, **Up**, **Down** or **To bottom** to move it to the required position in the list.



**You can also right-click an overlay to display a menu allowing the relevant functions above to be applied to it.**

To reset the overlay settings to the original defaults, click **Reset to factory defaults...**, or to reset them to the defaults set in the **iDAP image settings** window, click **Reset to defaults...**

When you are happy with the overlay settings, click **OK** to save them and return to the **iDAP image output settings** window, or click **Cancel** to revert to the previous settings.

### Save area

In the **Save** area, select **Use default** to save the resulting iDAP image in the default path configured in the **iDAP image settings** window, or set a custom path by clicking the second radio button, then clicking the **Choose...** button and selecting the required folder in the **Output path** window which appears (similar to that shown in figure 2.3).

If you want the file name of the iDAP image to be constructed automatically based on the selected service, data type and products, select **Build file name automatically**. Choose which elements to include in the file name using the **Include** check-boxes, comprising **Channel** (such as *LRIT* or *HRIT*), **Service** (such as *MSG2* or *HimawariCast*), **Data type** (such as *MSG2\_RSS* or *Image*), **Products** (such as *VIS006* or *DK01IR1*) and **Date and time**.



**We recommend including at least the channel, data type and products in the file name to avoid overwriting files created by other iDAP image outputs which use the same product names.**



**If you switch on the Date and time automatic file naming option, every file will have a unique name so older data will not be overwritten. You must therefore ensure that obsolete files are deleted periodically, either manually or by a script or other program, to prevent all available storage space being used.**

If you want the resulting iDAP image to have the same name as the output, select **Use output name**. Alternatively, to give the resulting iDAP image a particular file name, select **Specify file name manually** and enter the required name in the box below it. The file extension *.did* will be appended to it automatically.




**If you add more than one iDAP image output for the same service, data type and products combination, you will need to specify their file names manually to avoid them overwriting each other's files.**

### Archive area

Switch on **Archive** if you want the resulting iDAP images from this output to be archived. The archive will be structured by date and time, as shown in figure 2.21. Select **Use default settings** to use the archiving settings configured in the **iDAP image settings** window or **Use custom settings** to configure specific archiving settings for this output.

If **Use custom settings** is selected set the archive path by clicking **Choose...** and selecting the required folder in the **Archive path** window which appears (similar to that shown in figure 2.3).

To delete archived images when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## iDAP chart outputs

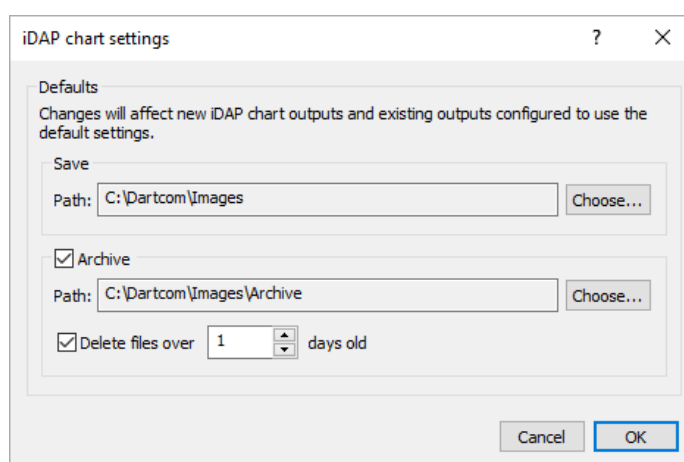
Unnavigated, uncalibrated image data products can be output to iDAP chart documents. These can be processed, animated, exported and printed automatically using the Dartcom MacroPro software, and viewed, manipulated and processed manually using the Dartcom iDAP software.

The resulting iDAP chart document can be named manually or automatically, saved to a user-defined path and archived if required.

### Configuring the iDAP chart format default settings

The iDAP chart format has a number of associated default settings which are used as a basis when adding new iDAP chart outputs. To configure them, select **iDAP chart** in the outputs tree, then click **Settings...** (below the tree). The **iDAP chart settings** window (figure 3.7) is displayed.

**Figure 3.7**  
The **iDAP chart settings** window



#### Save area

In the **Save** area, set the default path in which to save iDAP chart documents by clicking **Choose...** and selecting the required folder in the **Default output path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images*.

#### Archive area

If you want saved iDAP charts to be archived by default, switch on **Archive**. Set the default archive path by clicking **Choose...** and selecting the required folder in the **Default archive path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images\Archive*.

To delete archived iDAP charts by default when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## Adding or editing an iDAP chart output

To add a new iDAP chart output from scratch, select **iDAP chart** in the outputs tree and click **Add...** (below the tree). To add a new iDAP chart output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing iDAP chart output, select it in the tree and click **Edit....** In all these cases, the **iDAP chart output settings** window (figure 3.8) is displayed.

**Figure 3.8**  
The **iDAP chart output settings** window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive (*Cloud top height*, for example). If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the product you wish to output is received using the **Service** drop-list, then select the product's data type using the **Data type** drop-list, and finally the product's name using the **Product** drop-list. A preview of the selected product is shown on the right-hand side of the window (figure 3.9).

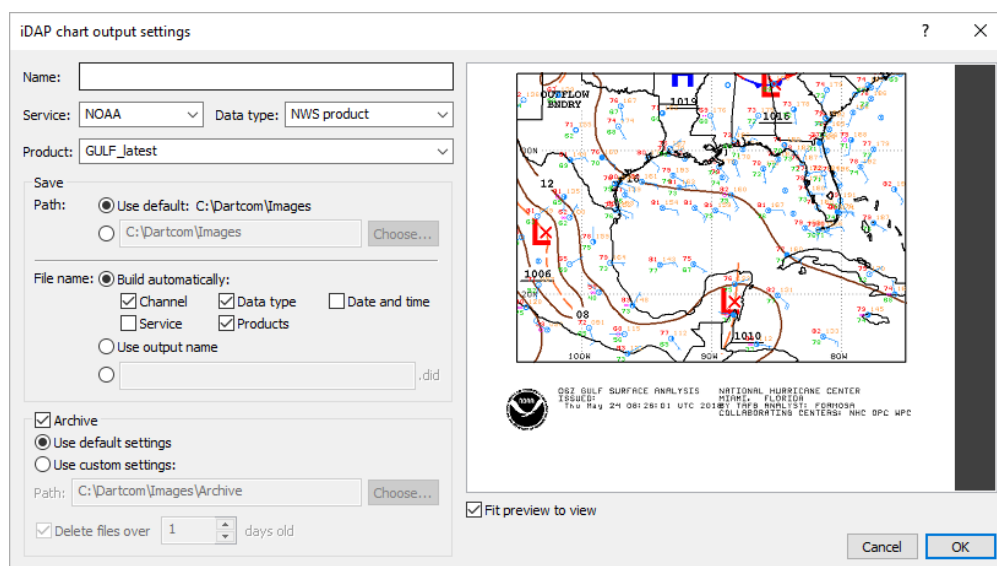


**If the required product has not yet been ingested, you can enter its service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive. Also note that no preview will be displayed.**



**Figure 3.9**

The **iDAP chart output settings** window with a product preview displayed



### Save area

In the **Save** area, select **Use default** to save the resulting iDAP chart in the default path configured in the **iDAP chart settings** window, or set a custom path by clicking the second radio button, then clicking the **Choose...** button and selecting the required folder in the **Output path** window which appears (similar to that shown in figure 2.3).

If you want the file name of the iDAP chart document to be constructed automatically based on the selected service, data type and product, select **Build file name automatically**. Choose which elements to include in the file name using the **Include** check-boxes, comprising **Channel** (such as *LRIT*), **Service** (such as *GK-2A*), **Data type** (such as *Additional data*), **Products** (such as *CTH* or *GOCI*) and **Date and time**.



**We recommend including at least the channel, data type and product in the file name to avoid overwriting files created by other iDAP chart outputs which use the same product name.**



**If you switch on the Date and time automatic file naming option, every file will have a unique name so older data will not be overwritten. You must therefore ensure that obsolete files are deleted periodically, either manually or by a script or other program, to prevent all available storage space being used.**

If you want the resulting iDAP chart to have the same name as the output, select **Use output name**. Alternatively, to give the resulting iDAP chart a particular file name, select **Specify file name manually** and enter the required name in the box below it. The file extension *.did* will be appended to it automatically.




**If you add more than one iDAP chart output for the same service, data type and product combination, you will need to specify their file names manually to avoid them overwriting each other's files.**

### Archive area

Switch on **Archive** if you want the resulting iDAP chart documents from this output to be archived. The archive will be structured by date and time, as shown in figure 2.21. Select **Use default settings** to use the archiving settings configured in the **iDAP chart settings** window or **Use custom settings** to configure specific archiving settings for this output.

If **Use custom settings** is selected set the archive path by clicking **Choose...** and selecting the required folder in the **Archive path** window which appears (similar to that shown in figure 2.3).

To delete archived iDAP charts when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## PGM file outputs

Another way in which image data products can be output from the Geostationary Ingestor software is as single-plane (greyscale) PGM files. These can be processed further using a wide range of third-party image processing software.

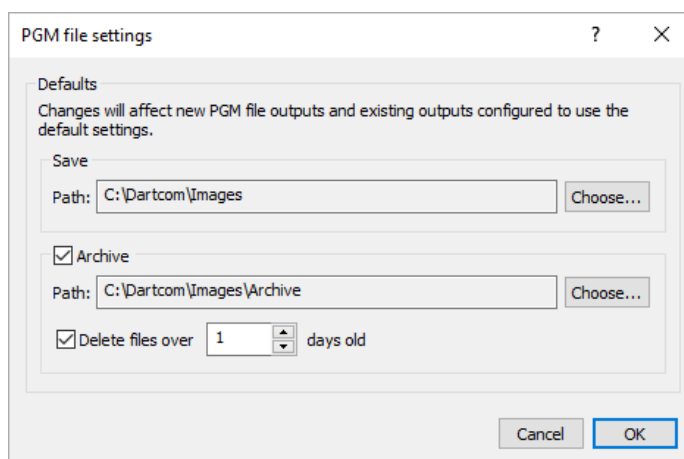
Each PGM file output saves a selected area of a particular image data product (such as *MSG1: VIS006* or *GOES-16: IR15 FD*) as a raw PGM (portable grey map) file with either 8-bit or 16-bit data resolution. With 8-bit PGM files, data of a higher resolution is reduced to 8-bit using a simple shift method. With 16-bit PGM files, data of a lower resolution is right-justified within the 16-bit word, with the remaining bits set to 0.

The image data can be sub-sampled to reduce its size by specifying either a sub-sample factor (such as 1:4) or a required width or height (such as 1000 pixels). The resulting PGM file can be named manually or automatically, saved to a user-defined path and archived if required.

### Configuring the PGM file format default settings

The PGM file format has a number of associated default settings which are used as a basis when adding new PGM file outputs. To configure them, select **PGM file** in the outputs tree, then click **Settings...** (below the tree). The **PGM file settings** window (figure 3.10) is displayed.

**Figure 3.10**  
The **PGM file settings**  
window






### Save area

In the **Save** area, set the default path in which to save PGM files by clicking **Choose...** and selecting the required folder in the **Default output path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images*.

### Archive area

If you want saved PGM files to be archived by default, switch on **Archive**. Set the default archive path by clicking **Choose...** and selecting the required folder in the **Default archive path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images\Archive*.

To delete archived PGM files by default when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## Adding or editing a PGM file output

To add a new PGM file output from scratch, select **PGM file** in the outputs tree and click **Add...** (below the tree). To add a new PGM file output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing PGM file output, select it in the tree and click **Edit...** In all these cases, the **PGM file output settings** window (figure 3.11) is displayed.

**Figure 3.11**  
The **PGM file output settings** window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive (*Whole earth*

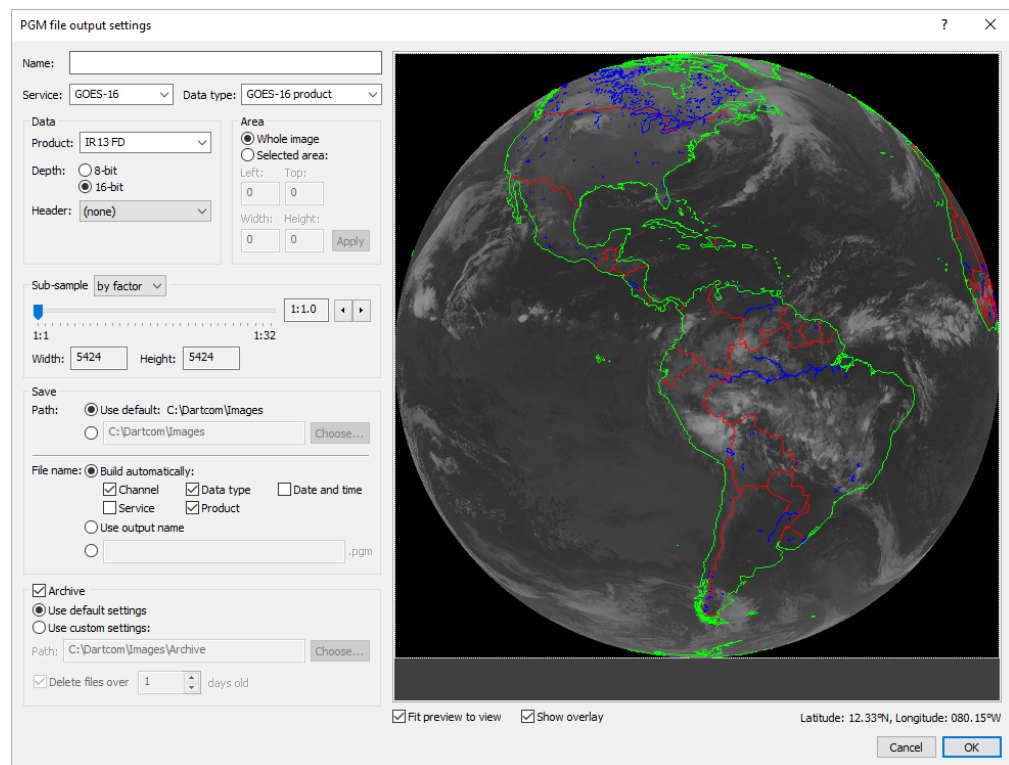
visible, for example). If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the product you wish to output is received using the **Service** drop-list, then select the product's data type using the **Data type** drop-list.

### Data area

In the **Data** area, choose the required product using the **Product** drop-list. A preview of the selected product is displayed on the right-hand side of the window (figure 3.12).

**Figure 3.12**  
The **PGM file output settings** window with a product preview displayed



If the required product has not yet been ingested, you can enter its service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive. Also note that no preview will be displayed and you will be limited to the whole image with sub-sampling by factor only.

Select the required bit depth for the PGM file using the **Depth** radio buttons. Select the type of accompanying header file to produce using the **Header** drop-list. The available header types are described in table 3.2.

**Table 3.2**  
PGM file header types

Type	Description
(none)	No header file created
ENVI/IDL	Creates a proprietary-format header file for use with the Dartcom ENVI/IDL support routines (available separately)

### Area area

In the **Area** area, select **Whole image** if you want to output the entire product, or select **Selected area** if you want to output only part of it. In the latter case, use the mouse to draw a “rubber band box” (or *marquee*) around the required area on the preview image. The position and size of the selected area (in pixels) are shown in the **Left**, **Top**, **Width**

and **Height** boxes respectively. The marquee can be moved by dragging the mouse inside it and resized by dragging the mouse on its edges and corners. As you move the mouse over the marquee, the pointer changes to show how it can be altered.



**If the required area is small and not clearly visible on the preview, switch off the Fit preview to view check-box (below the preview) to view it at its full resolution. Use the Show overlay check-box in the same way if the overlay is obscuring the part of the image in which you are interested.**

Alternatively you can enter the required position and size of the area in the **Left**, **Top**, **Width** and **Height** boxes and click **Apply**.

### Sub-sample area

In the **Sub-sample** area, select the required sub-sampling method using the drop-list. If **by factor** is selected, set the required sub-sample factor using the slider or arrow buttons. The factor is displayed between them. A factor of 1:2 results in an image half its original size, 1:3 a third its original size, and so on. The size of the resulting image (in pixels) is shown in the **Width** and **Height** boxes below the slider.

If **to size** is selected in the drop-list, the **Sub-sample** area changes as shown in figure 3.13.

**Figure 3.13**

The **Sub-sample** area of the **PGM file output settings** window (to size)

Select whether or not to size the image to a particular width or height using the **Width** and **Height** radio buttons respectively. Enter the required width or height in the appropriate box or use the corresponding buttons to adjust it. Click **Maximum** to set the width or height to the maximum possible for the selected area. The resulting sub-sample factor which will be used to produce the image is displayed in the **Factor** box.

### Save area

In the **Save** area, select **Use default** to save the resulting PGM file in the default path configured in the **PGM file settings** window, or set a custom path by clicking the second radio button, then clicking the **Choose...** button and selecting the required folder in the **Output path** window which appears (similar to that shown in figure 2.3).

If you want the file name of the PGM file to be constructed automatically based on the selected service, data type and product, select **Build file name automatically**. Choose which elements to include in the file name using the **Include** check-boxes, comprising **Channel** (such as *LRIT* or *HRIT*), **Service** (such as *MSG2* or *HimawariCast*), **Data type** (such as *MSG2\_RSS* or *Image*), **Products** (such as *VIS006* or *DK01IR1*) and **Date and time**.



**We recommend including at least the channel, data type and product in the file name to avoid overwriting files created by other PGM file outputs which use the same product name.**



**If you switch on the Date and time automatic file naming option, every file will have a unique name so older data will not be overwritten. You must therefore ensure that obsolete files are deleted periodically, either manually or by a script or other program, to prevent all available storage space being used.**

If you want the resulting PGM file to have the same name as the output, select **Use output name**. Alternatively, to give the resulting PGM file a particular file name, select **Specify file name manually** and enter the required name in the box below it. The file extension *.pgm* will be appended to it automatically.




**If you add more than one PGM file output for the same service, data type and product combination, you will need to specify their file names manually to avoid them overwriting each other's files.**

### Archive area

Switch on **Archive** if you want the resulting PGM files from this output to be archived. The archive will be structured by date and time, as shown in figure 2.21. Select **Use default settings** to use the archiving settings configured in the **PGM file settings** window or **Use custom settings** to configure specific archiving settings for this output.

If **Use custom settings** is selected set the archive path by clicking **Choose...** and selecting the required folder in the **Archive path** window which appears (similar to that shown in figure 2.3).

To delete archived PGM files when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## PCI Geomatica outputs

As well as iDAP image documents and PGM files, image data products can be output from the Geostationary Ingestor software as multi-plane files for use with the PCI Geomatica image processing software. The data is transformed to user-defined map projections and the files can include the raw data values (at full data resolution), calibrated data values and additional data such as solar zenith and azimuth angles.

The resulting PCI Geomatica files can be named manually or automatically, saved to a user-defined path and archived if required.



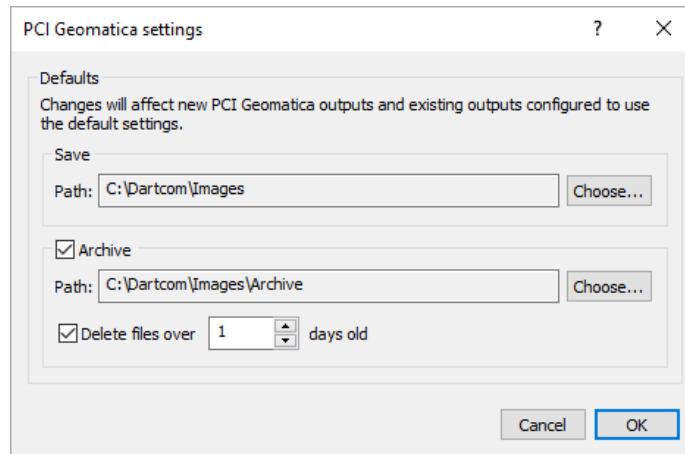
**PCI Geomatica outputs will only be produced if your Dartcom software licence includes the PCI Geomatica export component. Please contact Dartcom if you would like to add it to your software licence.**

### Configuring the PCI Geomatica format default settings

The PCI Geomatica format has a number of associated settings which are used as the defaults for PCI Geomatica outputs. To configure them, select **PCI Geomatica** in the

outputs tree, then click **Settings...** (below the tree). The **PCI Geomatica settings** window (figure 3.14) is displayed.

**Figure 3.14**  
The **PCI Geomatica settings** window



### Save area

In the **Save** area, set the default path in which to save PCI Geomatica files by clicking **Choose...** and selecting the required folder in the **Default output path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images*.

### Archive area

If you want saved PCI Geomatica files to be archived by default, switch on **Archive**. Set the default archive path by clicking **Choose...** and selecting the required folder in the **Default archive path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images\Archive*.

To delete archived PCI Geomatica files by default when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## Adding or editing a PCI Geomatica output

To add a new PCI Geomatica output from scratch, select **PCI Geomatica** in the outputs tree and click **Add...** (below the tree). To add a new PCI Geomatica output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing PCI Geomatica output, select it in the tree and click **Edit....** In all these cases, the **PCI Geomatica output settings** window (figure 3.15) is displayed.

**Figure 3.15**  
The **PCI Geomatica**  
output settings  
window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive (*Europe*, for example). If you don't enter a name, one will be created automatically which incorporates the selected service, data type and products.

### Options area

Select the products to include in the resulting file using the tick-boxes in the **Products** list. Use the **Tick all** and **Untick all** buttons below the list to quickly tick all products or no products respectively. To add a specific product to the list if it has not yet been received, click **Add** and enter its name. To delete one or more products from the list, select them and click **Delete**.

Use the **Data** tick-boxes to choose what types of data to include. **Raw** exports the raw pixel values at full data resolution for each channel. **Calibrated** exports the calibrated data values for each channel. **Additional data** exports the solar zenith and azimuth angles for each pixel. A summary of the data that will be exported is shown under the tick-boxes.

### Save area

Choose whether to save the resulting file in the default path (set in the **PCI Geomatica settings** window) or a custom path using the **Path** controls. In the latter case, set the path by clicking **Choose...** and selecting the required folder in the **Output path** window which appears (similar to that shown in figure 2.3).

If you want the name of the resulting file to be constructed automatically based on the selected service, data type and product, select **Build file name automatically**. Choose which elements to include in the file name using the **Include** check-boxes, comprising **Channel** (such as *LRIT* or *HRIT*), **Service** (such as *MSG2* or *HimawariCast*), **Data type** (such as *MSG2\_RSS* or *Image*), **Products** (such as *VIS006* or *DK01IR1*) and **Date and time**.





**We recommend including at least the channel, data type and products in the file name to avoid overwriting files created by other PCI Geomatica outputs which use the same product names.**



**If you switch on the Date and time automatic file naming option, every file will have a unique name so older data will not be overwritten. You must therefore ensure that obsolete files are deleted periodically, either manually or by a script or other program, to prevent all available storage space being used.**


If you want the resulting file to have the same name as the output, select **Use output name**. Alternatively, to give the resulting file a particular file name, select **Specify file name manually** and enter the required name in the box below it. The file extension *.pix* will be appended to it automatically.



**If you add more than one PCI Geomatica output for the same service, data type and product combination, you will need to specify their file names manually to avoid them overwriting each other's files.**

### Archive area



Click **Use default settings** to use the default archiving settings (set in the **PCI Geomatica settings** window) or click **Use custom settings** to specify particular settings for this output. Set the archive path by clicking **Choose...** and selecting the required folder in the **Archive path** window which appears (similar to that shown in figure 2.3).

To delete archived data when it exceeds a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



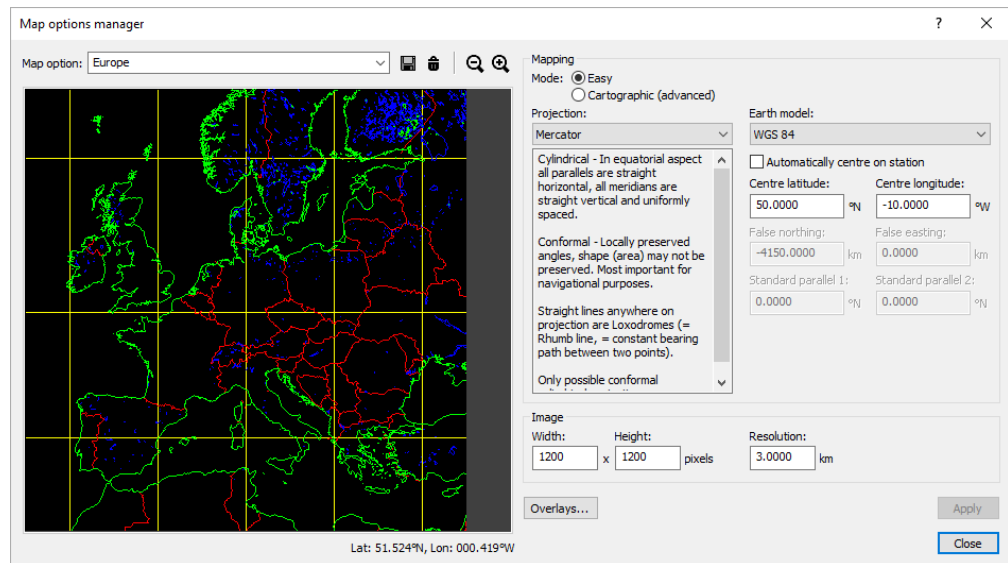
**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

### Map option area

Choose the required map option from those available in the drop-list. A preview of the area covered is shown below the drop-list. Move the mouse over the preview to obtain latitude and longitude read-outs. Use the  and  buttons to change the magnification of the preview. Note that this does not affect the size or magnification of the resulting file.

To edit or delete the selected map option or add a new one, click **Edit...** The **Map options manager** window (figure 3.16) is displayed.

**Figure 3.16**  
The **Map options manager** window



A *map option* defines a cartographic projection, geographical area, physical image size and overlay settings.

To load an existing map option, choose it from those available in the **Map option** drop-list, or to create a new map option, choose (**new**).

A preview of the area covered by the map option is shown below the drop-list. You can read off latitudes and longitudes from the map option preview by moving the mouse over it. Use the and icons to change the magnification of the preview. Note that this does not affect the size or magnification of the actual image.

If you make any changes to the selected map option, click the icon (highlighted indicating unsaved changes) to save them. To save the current settings as a new map option, type the required name in the **Map option** box and click the icon. To delete the selected map option, click the icon.



**After making changes to any of the mapping settings, image settings or overlays, click Apply to update the preview.**

### Mapping area

This area allows the projection type and parameters to be specified. It can be used in two modes. In *easy mode*, the map centre point is entered and the projection parameters are calculated automatically. In *cartographic mode*, the projection parameters must be entered manually. Select the required mode using the **Easy** and **Cartographic** radio buttons.

Select the required map projection from those available in the **Projection** drop-list. A description of the selected projection and its parameters is displayed in the box underneath the drop-list.

If the selected projection allows it, select the required earth model (or *spheroid*) from those available in the **Earth model** drop-list. **WGS 84** is the earth model most commonly used for mapping.

Enter the projection parameters in the boxes below the **Earth model** drop-list. The titles and availability of these boxes will vary according to the selected mode and projection. Switch on **Automatically centre on station** if you want the map centre point to be adjusted automatically to match the current station position.





**Geostationary Ingester is not aware of the station position, so the Automatically centre on station option will have no effect within Geostationary Ingester. However the Dartcom Polar Orbiter Ingester and iDAP/MacroPro software are aware of the station position and can therefore centre map options on it.**

To update the preview after making changes to the mapping settings, click **Apply**.

#### **Image area**

Enter the required width and height (in pixels) and resolution (in kilometres) for the image. To update the preview, click **Apply**.

#### **Overlays... button**

To configure the map option's overlays, click **Overlays....** The **Overlay settings** window (figure 3.6) is displayed, allowing grid lines and overlays to be switched on or off and their colours and styles to be changed. This window is described in **Adding or editing an iDAP image output** earlier in this section.

## **ERDAS IMAGINE outputs**

As well as PCI Geomatica files, image data products can be output from the Geostationary Ingester software as multi-plane files for use with the ERDAS IMAGINE image processing software. The data is transformed to user-defined map projections and the files can include the raw data values (at full data resolution), calibrated data values and additional data such as solar zenith and azimuth, nadir to pixel and satellite inclination angles.

The resulting ERDAS IMAGINE files can be named manually or automatically, saved to a user-defined path and archived if required.



**ERDAS IMAGINE outputs will only be produced if your Dartcom software licence includes the ERDAS IMAGINE export component. Please contact Dartcom if you would like to add it to your software licence.**

The process for configuring the ERDAS IMAGINE settings and adding or editing ERDAS IMAGINE outputs is the same as for PCI Geomatica outputs (described earlier in this section). The file extension *.img* will be automatically appended to file names.

## **ENVI/IDL outputs**

As well as PCI Geomatica files, image data products can be output from the Geostationary Ingester software as multi-plane files for use with the ENVI/IDL image processing software. The data is transformed to user-defined map projections and the files can include the raw data values (at full data resolution), calibrated data values and additional data such as solar zenith and azimuth, nadir to pixel and satellite inclination angles.

The resulting ENVI/IDL files can be named manually or automatically, saved to a user-defined path and archived if required.



**ENVI/IDL outputs will only be produced if your Dartcom software licence includes the ENVI/IDL export component. Please contact Dartcom if you would like to add it to your software licence.**

The process for configuring the ENVI/IDL settings and adding or editing ENVI/IDL outputs is the same as for PCI Geomatica outputs (described earlier in this section). The file extension *.dat* will be automatically appended to file names.

## GeoTIFF outputs

As well as PCI Geomatica files, image data products can be output from the Geostationary Ingestor software as multi-plane GeoTIFF files for use with a wide variety of image processing software. The data is transformed to user-defined map projections and the files can include the raw data values (at full data resolution), calibrated data values and additional data such as solar zenith and azimuth, nadir to pixel and satellite inclination angles.

The resulting GeoTIFF files can be named manually or automatically, saved to a user-defined path and archived if required.



**GeoTIFF outputs will only be produced if your Dartcom software licence includes the GeoTIFF export component. Please contact Dartcom if you would like to add it to your software licence.**

The process for configuring the GeoTIFF settings and adding or editing GeoTIFF outputs is the same as for PCI Geomatica outputs (described earlier in this section). The file extension *.tif* will be automatically appended to file names.

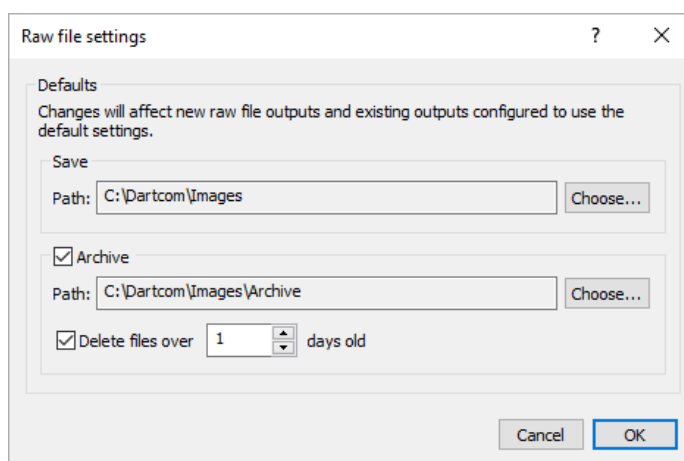
## Raw file outputs

The data from alpha-numeric text and binary products can be extracted and saved, with all headers removed. The resulting raw data files can be named manually or automatically, saved to a user-defined path and archived if required.

### Configuring the raw file format default settings

The raw file format has a number of associated default settings which are used as a basis when adding new raw file outputs. To configure them, select **Raw file** in the outputs tree, then click **Settings...** (below the tree). The **Raw file settings** window (figure 3.17) is displayed.

**Figure 3.17**  
The **Raw file settings** window




### Save area

In the **Save** area, set the default path in which to save raw files by clicking **Choose...** and selecting the required folder in the **Default output path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images*.

### Archive area

If you want saved raw files to be archived by default, switch on **Archive**. Set the default archive path by clicking **Choose...** and selecting the required folder in the **Default archive path** window which appears (similar to that shown in figure 2.3). The default path is *C:\Dartcom\Images\Archive*.

To delete archived raw files by default when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## Adding or editing a raw file output

To add a new raw file output from scratch, select **Raw file** in the outputs tree and click **Add...** (below the tree). To add a new raw file output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing raw file output, select it in the tree and click **Edit....** In all these cases, the **Raw file output settings** window (figure 3.18) is displayed.

**Figure 3.18**  
The **Raw file output settings** window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive (*Cloud top*

*height*, for example). If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the product you wish to output is received using the **Service** drop-list, then select the product's data type using the **Data type** drop-list, and finally the product's name using the **Product** drop-list.



**If the required product has not yet been ingested, you can enter its service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive.**

### Save area

In the **Save** area, select **Use default** to save the resulting raw file in the default path configured in the **Raw file settings** window, or set a custom path by clicking the second radio button, then clicking the **Choose...** button and selecting the required folder in the **Output path** window which appears (similar to that shown in figure 2.3).

If you want the file name of the raw file to be constructed automatically based on the selected service, data type and product, select **Build file name automatically**. Choose which elements to include in the file name using the **Include** check-boxes, comprising **Channel** (such as *LRIT* or *HRIT*), **Service** (such as *MSG1* or *MSG2*), **Data type** (such as *MPEF*), **Products** (such as *CLAI* or *TOZ*) and **Date and time**.



**We recommend including at least the channel, data type and product in the file name to avoid overwriting files created by other raw file outputs which use the same product name.**

If you want the resulting raw file to have the same name as the output, select **Use output name**, or if you want the file to retain its original name, select **Use original file name**. Alternatively, to give the resulting raw file a particular file name, select the last option and enter the required name in the box next to it.



**If you switch on the Date and time automatic file naming option, or select the Use output name or Use original file name options, every file will have a unique name so older data will not be overwritten. You must therefore ensure that obsolete files are deleted periodically, either manually or by a script or other program, to prevent all available storage space being used.**




**If you add more than one raw file output for the same service, data type and product combination, you will need to use the output name or original file name or specify a name manually to avoid them overwriting each other's files.**

If you would like the file extension to be appended automatically based on the file's contents, select **Determine automatically by analysing data**, or to specify a particular file extension, select the second option and enter the required extension in the box next to it.

### Archive area

Switch on **Archive** if you want the resulting raw files from this output to be archived. The archive will be structured by date and time, as shown in figure 2.21. Select **Use default settings** to use the archiving settings configured in the **Raw file settings** window or **Use custom settings** to configure specific archiving settings for this output.

If **Use custom settings** is selected set the archive path by clicking **Choose...** and selecting the required folder in the **Archive path** window which appears (similar to that shown in figure 2.3).

To delete archived raw files when they exceed a maximum age (recommended to avoid using all available storage space) switch on **Delete files** and enter the required number of days in the box, or adjust it using the  buttons. The minimum is 1 day and the maximum 366.



**Ensure that the specified archive period can be accommodated within the available storage space. Calculation and experimentation may be required to determine the appropriate setting.**

## Lightning database outputs

GOES GLM and MTG LI lightning flash data can be output to an SQLite database file. This can then be used by the Dartcom iDAP/MacroPro software to show lightning flashes on images and animations, and create lightning density products.



**GOES GLM lightning data is ingested by the EUMETCast Other ingester. It has service GOES-*nn* (e.g. GOES-18), data type GLM-L2 and product name LCFA, and is in Tar archive format. For EUMETCast MTG LI lightning data, only the Lightning flashes product can be output to a lightning database.**

### Adding or editing a lightning database output

To add a new lightning database output from scratch, select **Lightning database** in the outputs tree and click **Add...** (below the tree). To add a new lightning database output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing lightning database output, select it in the tree and click **Edit....** In all these cases, the **Lightning database output settings** window (figure 3.19) is displayed.

**Figure 3.19**  
The **Lightning database output settings** window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree. If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the product you wish to output to the lightning database is received using the **Service** drop-list, then select the product's data type using the **Data type** drop-list, and finally select the required product using the **Product** drop-list.



**If the required product has not yet been ingested, you can enter the service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive.**

Choose the required path and name of the database file using the **Choose...** button. You should use the same database file for all types of lightning flash data so iDAP and MacroPro can combine them.

To delete data from the database when it exceeds a maximum age (recommended for optimal performance and to avoid all available storage being used), switch on **Delete data over** and enter the required number of days in the box, or adjust it using the buttons. The minimum is 1 day and the maximum 366.



**If you want lightning to be shown on archived images, you should set the maximum age the same as that configured for the archiving. If you want lightning to appear on all historical images, you should leave the Delete data over tick-box switched off, ensuring the lightning database does not grow to use all available storage.**

## Email outputs

Alpha-numeric text products normally comprise mainly service messages which provide operational information for their associated service and are therefore useful to the system operator. A convenient way of receiving these in a timely manner is for them to be sent via email.

Each email output sends to a specified email address the contents of a particular alpha-numeric text product (such as *SERVICE: ADMIN* or *SERVICE: NEWS*).

### Configuring the email output settings

The email outputs have a number of associated settings which are common to all of them. To configure the settings, select **Email** in the outputs tree, then click **Settings...** (below the tree). The **Email settings** window (figure 3.20) is displayed.

**Figure 3.20**  
The **Email settings** window

Enter an email address which identifies the PC running the Geostationary Ingestor software in the **From** box. Enter the host name or IP address of an available SMTP server (or mail relay) in the **SMTP host** box.



**For email outputs to be sent, the specified SMTP server must be available on your network or via your internet connection at all times. If the server is not available for any reason, the software will not be able to send email outputs.**

If your SMTP server requires a non-standard port number, enter it in the **Port** box (25 is the default). If your SMTP server requires authentication, switch on **Authenticate** and enter a valid user name and password in the **User** and **Password** boxes respectively.

## Adding or editing an email output

To add a new email output from scratch, select **Email** in the outputs tree and click **Add...** (below the tree). To add a new email output based on an existing one, select that output in the tree and click **Duplicate...**. To edit an existing email output, select it in the tree and click **Edit...**. In all these cases, the **Email output settings** window (figure 3.21) is displayed.

**Figure 3.21**  
The **Email output settings** window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive (*Send admin messages to me*, for example). If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the product you wish to output is received using the **Service** drop-list, then select the product's data type using the **Data type** drop-list, and finally select the required product using the **Product** drop-list.



**If the required product has not yet been ingested, you can enter the service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive.**

Enter the destination email address for the selected product in the **Send to** box. Multiple addresses can be entered if required, separated by commas.

## Serial outputs

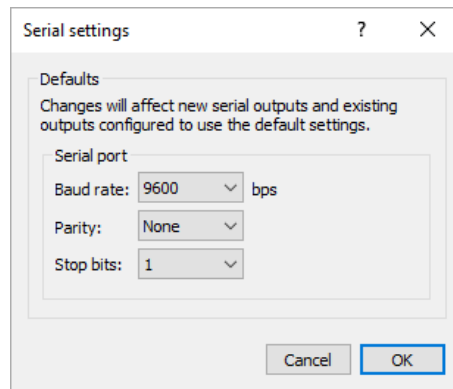
The serial outputs assemble ingested files into a data stream which is transmitted via a specified serial port, for interfacing with third-party hardware or software.

### Configuring the serial output settings

The serial outputs have a number of associated default settings which are used as a basis when adding new serial outputs. To configure them, select **Serial** in the outputs tree, then click **Settings...** (below the tree). The **Serial settings** window (figure 3.22) is displayed.



**Figure 3.22**  
The **Serial settings**  
window



The **Serial settings** window is a dialog box with a title bar containing a question mark and a close button. It features a section titled **Defaults** with the text: "Changes will affect new serial outputs and existing outputs configured to use the default settings." Below this is a **Serial port** section containing three drop-down menus: **Baud rate** (set to 9600), **Parity** (set to None), and **Stop bits** (set to 1). At the bottom right are **Cancel** and **OK** buttons.

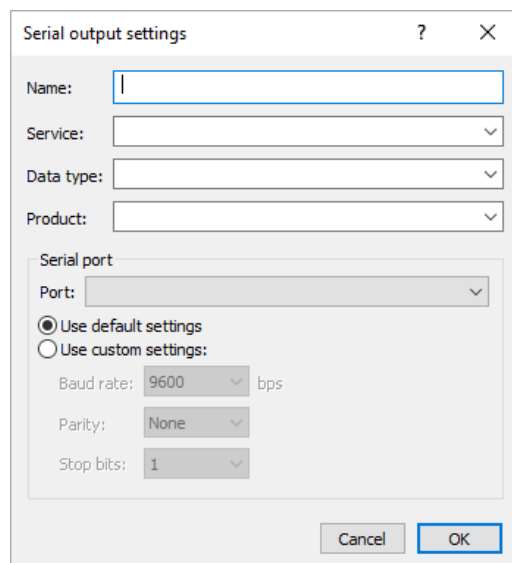
### Serial port area

In the **Serial port** area, select the default serial port baud rate, parity and stop bits using the corresponding drop-lists. The number of data bits is fixed to 8.

## Adding or editing a serial output

To add a new serial output from scratch, select **Serial** in the outputs tree and click **Add...** (below the tree). To add a new serial output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing serial output, select it in the tree and click **Edit....** In all these cases, the **Serial output settings** window (figure 3.23) is displayed.

**Figure 3.23**  
The **Serial output**  
**settings** window



The **Serial output settings** window is a dialog box with a title bar containing a question mark and a close button. It contains several input fields and drop-down menus: **Name** (text box), **Service** (drop-down), **Data type** (drop-down), and **Product** (drop-down). Below these is a **Serial port** section with a **Port** drop-down menu. Underneath are two radio buttons: **Use default settings** (selected) and **Use custom settings**. If **Use custom settings** is selected, there are three drop-down menus for **Baud rate** (9600), **Parity** (None), and **Stop bits** (1). At the bottom right are **Cancel** and **OK** buttons.

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive. If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the data you wish to output is received using the **Service** drop-list, then select the corresponding data type using the **Data type** drop-list, and finally the product's name using the **Product** drop-list.



**If the required product has not yet been ingested, you can enter its service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive.**



### Serial port area

Choose the serial port on which to output the data stream using the **Port** drop-list. Select **Use default settings** to use the serial port settings configured in the **Serial settings** window or **Use custom settings** to configure specific serial port settings for this output.

Select the required serial port baud rate, parity and stop bits using the corresponding drop-lists. The number of data bits is fixed to 8.

## TCP/IP outputs

The TCP/IP outputs assemble ingested files into a data stream which is transmitted via a TCP/IP socket, for interfacing with third-party hardware or software.

### Adding or editing a TCP/IP output

To add a new TCP/IP output from scratch, select **TCP/IP** in the outputs tree and click **Add...** (below the tree). To add a new TCP/IP output based on an existing one, select that output in the tree and click **Duplicate....** To edit an existing TCP/IP output, select it in the tree and click **Edit....** In all these cases, the **TCP/IP output settings** window (figure 3.24) is displayed.

**Figure 3.24**  
The **TCP/IP output settings** window

If required, enter a name for the output in the **Name** box. This is purely to enable you to identify it in the outputs tree, and the name should therefore be descriptive. If you don't enter a name, one will be created automatically which incorporates the selected service, data type and product.

Select the service from which the data you wish to output is received using the **Service** drop-list, then select the corresponding data type using the **Data type** drop-list, and finally the product's name using the **Product** drop-list.



**If the required product has not yet been ingested, you can enter its service, data type and product in the boxes manually if you know what they will be. If you do so, ensure that you use upper or lower case appropriately because they are case-sensitive.**

### Connection area

TCP/IP streams have a client-server relationship, like a telephone conversation. The client host has to make a connection to the server host before data will flow.

Select the role to be taken by the output using the **Role** radio buttons. **Client** attempts to connect to a server host. **Server** listens for an incoming connection request from a client host, and only allows one client at a time to be connected.

If **Client** is selected, enter the server host name or IP address in the **Host** box (127.0.0.1 for the local host), and the TCP port number to which to connect in the **Port** box.

If **Server** is selected, enter the TCP port number on which to listen for client connections in the **Port** box.



