Image I/O Reference Collection

Graphics & Imaging > Quartz

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Header file directories	/System/Library/Frameworks/ApplicationServices.framework/ImageIO.framework/Headers
Declared in	CGImageDestination.h CGImageProperties.h CGImageSource.h

This collection of documents provides the programming interface reference for image input and output.

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Image I/O Reference Collection

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Opaque Types

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PART I

Opaque Types

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CGImageDestination Reference

Derived From:	CFType
Framework:	ApplicationServices/ImageIO
Declared in	CGImageDestination.h
Companion guide	Quartz 2D Programming Guide

Overview

CGImageDestination objects, available in Mac OS X v10.4 or later, abstract the data-writing task. An image destination can represent a single image or multiple images. It can contain thumbnail images as well as properties for each image.

The functions described in this reference can write data to three kinds of destinations: a URL, a `CFData` object, and a data consumer. After creating a CGImageDestination object for the appropriate destination, you can add image data and set image properties. When you are finished adding data, call the function `CGImageDestinationFinalize` to write the image data and properties to the URL, `CFData` object, or data consumer.

Functions by Task

Creating Image Destinations

`CGImageDestinationCreateWithDataConsumer` (page 14)
Creates an image destination that writes to the specified data consumer.

`CGImageDestinationCreateWithData` (page 14)
Creates an image destination that writes to a Core Foundation mutable data object.

`CGImageDestinationCreateWithURL` (page 15)
Creates an image destination that writes to a location specified by a URL.

Adding Images

`CGImageDestinationAddImage` (page 12)
Adds an image to an image destination.

`CGImageDestinationAddImageFromSource` (page 13)
Adds an image from an image source to an image destination.

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Getting Type Identifiers

`CGImageDestinationCopyTypeIdentifiers` (page 13)
Returns an array of the uniform type identifiers (UTIs) that are supported for image destinations.

`CGImageDestinationGetTypeID` (page 16)
Returns the unique type identifier of an image destination opaque type.

Setting Properties

`CGImageDestinationSetProperties` (page 16)
Applies one or more properties to all images in an image destination.

Finalizing an Image Destination

`CGImageDestinationFinalize` (page 15)
Writes image data and properties to the data, URL, or data consumer associated with the image destination.

Functions

CGImageDestinationAddImage

Adds an image to an image destination.

```
void CGImageDestinationAddImage (
    CGImageDestinationRef idst,
    CGImageRef image,
    CFDictionaryRef properties
);
```

Parameters

idst
An image destination

image
The image to add.

properties
An optional dictionary that specifies the properties of the added image. The dictionary can contain any of the properties described in "`Destination Properties`" (page 17) or the image properties described in *CGImageProperties Reference*.

Discussion
The function logs an error if you add more images than what you specified when you created the image destination.

Availability
Available in Mac OS X version 10.4 and later.

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Declared In
CGImageDestination.h

CGImageDestinationAddImageFromSource

Adds an image from an image source to an image destination.

```
void CGImageDestinationAddImageFromSource (
    CGImageDestinationRef idst,
    CGImageSourceRef isrc,
    size_t index,
    CFDictionaryRef properties
);
```

Parameters

idst
An image destination.

isrc
An image source.

index
An index that specifies the location of the image in the image source. The index is zero-based.

properties
A dictionary that specifies properties to overwrite or add to the source image properties. If a key in `properties` has the value `kCFNull`, the corresponding property in the image destination is removed. The dictionary can contain any of the properties described in "Destination Properties" (page 17) or the image properties described in *CGImageProperties Reference*.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
CGImageDestination.h

CGImageDestinationCopyTypeIdentifiers

Returns an array of the uniform type identifiers (UTIs) that are supported for image destinations.

```
CFArrayRef CGImageDestinationCopyTypeIdentifiers (
    void
);
```

Return Value
Returns an array of the UTIs that are supported for image destinations. See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs that can be returned.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
CGImageDestination.h

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CGImageDestinationCreateWithData

Creates an image destination that writes to a Core Foundation mutable data object.

```
CGImageDestinationRef CGImageDestinationCreateWithData (
    CFMutableDataRef data,
    CFStringRef type,
    size_t count,
    CFDictionaryRef options
);
```

Parameters

data

The data object to write to. For more information on data objects, see *CFData Reference* and Data Objects.

type

The uniform type identifier (UTI) of the resulting image file. See *Uniform Type Identifiers Overview* for a list of system-declared and third-party UTIs.

count

The number of images (not including thumbnail images) that the image file will contain.

options

Reserved for future use. Pass `NULL`.

Return Value

An image destination. You are responsible for releasing this object using `CFRelease`.

Availability

Available in Mac OS X version 10.4 and later.

Declared In

`CGImageDestination.h`

CGImageDestinationCreateWithDataConsumer

Creates an image destination that writes to the specified data consumer.

```
CGImageDestinationRef CGImageDestinationCreateWithDataConsumer (
    CGDataConsumerRef consumer,
    CFStringRef type,
    size_t count,
    CFDictionaryRef options
);
```

Parameters

consumer

The data consumer to write to. For information on data consumers see *CGDataConsumer Reference* and *Quartz 2D Programming Guide*.

type

The uniform type identifier (UTI) of the resulting image file. See *Uniform Type Identifiers Overview* for a list of system-declared and third-party UTIs.

count

The number of images (not including thumbnail images) that the image file will contain.

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options
Reserved for future use. Pass `NULL`.

Return Value
An image destination. You are responsible for releasing this object using `CFRelease`.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageDestination.h`

CGImageDestinationCreateWithURL

Creates an image destination that writes to a location specified by a URL.

```
CGImageDestinationRef CGImageDestinationCreateWithURL (
    CFURLRef url,
    CFStringRef type,
    size_t count,
    CFDictionaryRef options
);
```

Parameters

url
The URL to write to. If the URL already exists, the data at this location is overwritten.

type
The UTI (uniform type identifier) of the resulting image file. See *Uniform Type Identifiers Overview* for a list of system-declared and third-party UTIs.

count
The number of images (not including thumbnail images) that the image file will contain.

options
Reserved for future use. Pass `NULL`.

Return Value
An image destination. You are responsible for releasing this object using `CFRelease`.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageDestination.h`

CGImageDestinationFinalize

Writes image data and properties to the data, URL, or data consumer associated with the image destination.

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```
bool CGImageDestinationFinalize (
   CGImageDestinationRef idst
);
```

Parameters

idst

An image destination.

Return Value
Returns `true` if the image is successfully written; `false` otherwise.

Discussion
You must call this function or the output of the image destination will not be valid. After calling this function, no additional data can be added to the image destination.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageDestination.h`

CGImageDestinationGetTypeID

Returns the unique type identifier of an image destination opaque type.

```
CFTypeID CGImageDestinationGetTypeID (
    void
);
```

Return Value
Returns the Core Foundation type ID for an image destination.

Discussion
A type identifier is an integer that identifies the opaque type to which a Core Foundation object belongs. You use type IDs in various contexts, such as when you are operating on heterogeneous collections.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageDestination.h`

CGImageDestinationSetProperties

Applies one or more properties to all images in an image destination.

```
void CGImageDestinationSetProperties (
    CGImageDestinationRef idst,
    CFDictionaryRef properties
);
```

Parameters

idst

An image destination.

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properties
A dictionary that contains the properties to apply. You can set any of the properties described in "Destination Properties" (page 17) or the image properties described in *CGImageProperties Reference*.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
CGImageDestination.h

Data Types

CGImageDestinationRef

An opaque type that represents an image destination.

```
typedef struct CGImageDestination *CGImageDestinationRef;
```

Availability
Available in Mac OS X v10.4 and later.

Declared In
CGImageDestination.h

Constants

Destination Properties

Properties for a single image in an image destination.

```
const CFStringRef kCGImageDestinationLossyCompressionQuality
const CFStringRef kCGImageDestinationBackgroundColor
```

Constants
kCGImageDestinationLossyCompressionQuality
The desired compression quality to use when writing to an image destination. If present, the value associated with this key must be a `CFNumberRef` data type in the range `0.0` to `1.0`. A value of `1.0` specifies to use lossless compression if destination format supports it. A value of 0.0 implies to use maximum compression.

Available in Mac OS X v10.4 and later.

Declared in `CGImageDestination.h`.

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`kCGImageDestinationBackgroundColor`

The desired background color to composite against when writing an image that has an alpha component to a destination format that does not support alpha. If present, the value associated with this key must be a `CGColorRef` data type without an alpha component of its own. If not present, and if a background color is needed, a white color is used.

Available in Mac OS X v10.4 and later.

Declared in `CGImageDestination.h`.

Declared In
`CGImageDestination.h`

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CGImageSource Reference

Derived From:	CFType
Framework:	ApplicationServices/ImageIO
Declared in	CGImageSource.h
Companion guides	Quartz 2D Programming Guide CGImage Reference

Overview

CGImageSource objects, available in Mac OS X v10.4 or later, abstract the data-reading task. An image source can read image data from a URL, a `CFData` object, or a data consumer.

After creating a CGImageSource object for the appropriate source, you can obtain images, thumbnails, image properties, and other image information using CGImageSource functions.

Functions by Task

Creating an Image Source

`CGImageSourceCreateWithDataProvider` (page 24)
Creates an image source that reads data from the specified data provider.

`CGImageSourceCreateWithData` (page 24)
Creates an image source that reads from a Core Foundation data object.

`CGImageSourceCreateWithURL` (page 25)
Creates an image source that reads from a location specified by a URL.

Creating Images From an Image Source

`CGImageSourceCreateImageAtIndex` (page 22)
Creates a CGImage object for the image data associated with the specified index in an image source.

`CGImageSourceCreateThumbnailAtIndex` (page 23)
Creates a thumbnail image of the image located at a specified location in an image source.

`CGImageSourceCreateIncremental` (page 22)
Create an incremental image source.

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Updating an Image Source

`CGImageSourceUpdateData` (page 28)
Updates an incremental image source with new data.

`CGImageSourceUpdateDataProvider` (page 28)
Updates an incremental image source with a new data provider.

Getting Information From an Image Source

`CGImageSourceGetTypeID` (page 27)
Returns the unique type identifier of an image source opaque type.

`CGImageSourceGetType` (page 27)
Returns the uniform type identifier of the source container.

`CGImageSourceCopyTypeIdentifiers` (page 21)
Returns an array of uniform type identifiers (UTIs) that are supported for image sources.

`CGImageSourceGetCount` (page 25)
Returns the number of images (not including thumbnails) in the image source.

`CGImageSourceCopyProperties` (page 20)
Returns the properties of the image source.

`CGImageSourceCopyPropertiesAtIndex` (page 21)
Returns the properties of the image at a specified location in an image source.

`CGImageSourceGetStatus` (page 26)
Return the status of an image source.

`CGImageSourceGetStatusAtIndex` (page 26)
Returns the current status of an image that is at a specified location in an image source.

Functions

CGImageSourceCopyProperties

Returns the properties of the image source.

```
CFDictionaryRef CGImageSourceCopyProperties (
   CGImageSourceRef isrc,
   CFDictionaryRef options
);
```

Parameters

isrc
An image source.

options
A dictionary you can use to request additional options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

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Return Value
A dictionary that contains the properties associated with the image source container. See *CGImageProperties Reference* for a list of properties that can be in the dictionary.

Discussion
These properties apply to the container in general but not necessarily to any individual image contained in the image source.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageSource.h`

CGImageSourceCopyPropertiesAtIndex

Returns the properties of the image at a specified location in an image source.

```
CFDictionaryRef CGImageSourceCopyPropertiesAtIndex (
   CGImageSourceRef isrc,
   size_t index,
   CFDictionaryRef options
);
```

Parameters

isrc
An image source.

index
The index of the image whose properties you want to obtain. The index is zero-based.

options
A dictionary you can use to request additional options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

Return Value
A dictionary that contains the properties associated with the image. See *CGImageProperties Reference* for a list of properties that can be in the dictionary.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageSource.h`

CGImageSourceCopyTypeIdentifiers

Returns an array of uniform type identifiers (UTIs) that are supported for image sources.

```
CFArrayRef CGImageSourceCopyTypeIdentifiers (
   void
);
```

Return Value
Returns an array of the UTIs that are supported for image sources.

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Discussion
See Uniform Type Identifiers Overview for a list of system-declared and third-party UTIs.

Availability
Available in Mac OS X version 10.4 and later.

Related Sample Code
CarbonCocoa_PictureCursor

Declared In
`CGImageSource.h`

CGImageSourceCreateImageAtIndex

Creates a CGImage object for the image data associated with the specified index in an image source.

```
CGImageRef CGImageSourceCreateImageAtIndex (
   CGImageSourceRef isrc,
   size_t index,
   CFDictionaryRef options
);
```

Parameters

isrc

An image source.

index

The index that specifies the location of the image. The index is zero-based.

options

A dictionary that specifies additional creation options. See "`Image Source Option Dictionary Keys`" (page 30) for the keys you can supply.

Return Value
Returns a CGImage object. You are responsible for releasing this object using `CGImageRelease`.

Availability
Available in Mac OS X version 10.4 and later.

Related Sample Code
CarbonCocoa_PictureCursor

Declared In
`CGImageSource.h`

CGImageSourceCreateIncremental

Create an incremental image source.

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```
CGImageSourceRef CGImageSourceCreateIncremental (
   CFDictionaryRef options
);
```

Parameters

options

A dictionary that specifies additional creation options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

Return Value

Returns an image source object. You are responsible for releasing this object using `CFRelease`.

Discussion

The function `CGImageSourceCreateIncremental` creates an empty image source container to which you can add data later by calling the functions `CGImageSourceUpdateDataProvider` or `CGImageSourceUpdateData`. You don't provide data when you call this function.

An incremental image is an image that is created in chunks, similar to the way large images viewed over the web are loaded piece by piece.

Availability

Available in Mac OS X version 10.4 and later.

Declared In

`CGImageSource.h`

CGImageSourceCreateThumbnailAtIndex

Creates a thumbnail image of the image located at a specified location in an image source.

```
CGImageRef CGImageSourceCreateThumbnailAtIndex (
   CGImageSourceRef isrc,
   size_t index,
   CFDictionaryRef options
);
```

Parameters

isrc

An image source.

index

The index that specifies the location of the image. The index is zero-based.

options

A dictionary that specifies additional creation options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

Return Value

A CGImage object. You are responsible for releasing this object using `CGImageRelease`.

Discussion

If the image source is a PDF, this function creates a 72 dpi image of the PDF page specified by the index that you pass. You must, however, pass an options dictionary that contains either the `kCGImageSourceCreateThumbnailFromImageIfAbsent` or `kCGImageSourceCreateThumbnailFromImageAlways` keys, with the value of the key set to `TRUE`.

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Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageSource.h`

CGImageSourceCreateWithData

Creates an image source that reads from a Core Foundation data object.

```
CGImageSourceRef CGImageSourceCreateWithData (
   CFDataRef data,
   CFDictionaryRef options
);
```

Parameters

data

The data object to read from. For more information on data objects, see *CFData Reference* and Data Objects.

options

A dictionary that specifies additional creation options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

Return Value
An image source. You are responsible for releasing this object using `CFRelease`.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageSource.h`

CGImageSourceCreateWithDataProvider

Creates an image source that reads data from the specified data provider.

```
CGImageSourceRef CGImageSourceCreateWithDataProvider (
   CGDataProviderRef provider,
   CFDictionaryRef options
);
```

Parameters

provider

The data provider to read from. For more information on data providers, see *CGDataProvider Reference* and *Quartz 2D Programming Guide*.

options

A dictionary that specifies additional creation options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

Return Value
An image source. You are responsible for releasing this object using `CFRelease`.

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Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageSource.h`

CGImageSourceCreateWithURL

Creates an image source that reads from a location specified by a URL.

```
CGImageSourceRef CGImageSourceCreateWithURL (
   CFURLRef url,
   CFDictionaryRef options
);
```

Parameters

url

The URL to read from.

options

A dictionary that specifies additional creation options. See "Image Source Option Dictionary Keys" (page 30) for the keys you can supply.

Return Value
An image source. You are responsible for releasing this object using `CFRelease`.

Availability
Available in Mac OS X version 10.4 and later.

Related Sample Code
CarbonCocoa_PictureCursor

Declared In
`CGImageSource.h`

CGImageSourceGetCount

Returns the number of images (not including thumbnails) in the image source.

```
size_t CGImageSourceGetCount (
   CGImageSourceRef isrc
);
```

Parameters

isrc

An image source.

Return Value
The number of images. If the image source is a multilayered PSD file, the function returns `1`.

Discussion
This function does not extract the layers of a PSD file.

Availability
Available in Mac OS X version 10.4 and later.

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Declared In
`CGImageSource.h`

CGImageSourceGetStatus

Return the status of an image source.

```
CGImageSourceStatus CGImageSourceGetStatus (
   CGImageSourceRef isrc
);
```

Parameters

isrc

An image source.

Return Value
Returns the current status of the image source. See "Image Source Status" (page 29) for a list of possible values.

Discussion
The status is particularly informative for incremental image sources, but may also be used by clients that provide non-incremental data.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
`CGImageSource.h`

CGImageSourceGetStatusAtIndex

Returns the current status of an image that is at a specified location in an image source.

```
CGImageSourceStatus CGImageSourceGetStatusAtIndex (
   CGImageSourceRef isrc,
   size_t index
);
```

Parameters

isrc

An image source.

index

The index of the image whose status you want to obtain. The index is zero-based.

Return Value
Returns the current status of the image. See "Image Source Status" (page 29) for a list of possible values.

Discussion
The status is particularly informative for incremental image sources, but may also be used by clients that provide non-incremental data.

Availability
Available in Mac OS X version 10.4 and later.

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Declared In
CGImageSource.h

CGImageSourceGetType

Returns the uniform type identifier of the source container.

```
CFStringRef CGImageSourceGetType (
   CGImageSourceRef isrc
);
```

Parameters

isrc
An image source.

Return Value
The uniform type identifier of the image.

Discussion
The uniform type identifier (UTI) of the source container can be different from the type of the images in the container. For example, the `.icns` format supports embedded `JPEG2000`. The type of the source container is `"com.apple.icns"` but type of the images is `JPEG2000`.

See Uniform Type Identifier Concepts for a list of system-declared and third-party UTIs.

Availability
Available in Mac OS X version 10.4 and later.

Declared In
CGImageSource.h

CGImageSourceGetTypeID

Returns the unique type identifier of an image source opaque type.

```
CFTypeID CGImageSourceGetTypeID (
   void
);
```

Return Value
Returns the Core Foundation type ID for an image source.

Discussion
A type identifier is an integer that identifies the opaque type to which a Core Foundation object belongs. You use type IDs in various contexts, such as when you are operating on heterogeneous collections. Note that a CFType ID is different from a uniform type identifier (UTI).

Availability
Available in Mac OS X version 10.4 and later.

Declared In
CGImageSource.h

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CGImageSourceUpdateData

Updates an incremental image source with new data.

```
void CGImageSourceUpdateData (
   CGImageSourceRef isrc,
   CFDataRef data,
   bool final
);
```

Parameters

isrc

An image source.

data

The data to add to the image source. Each time you call the function `CGImageSourceUpdateData`, the `data` parameter must contain all of the image file data accumulated so far.

final

A value that specifies whether the data is the final set. Pass `true` if it is, `false` otherwise.

Availability

Available in Mac OS X version 10.4 and later.

Declared In

`CGImageSource.h`

CGImageSourceUpdateDataProvider

Updates an incremental image source with a new data provider.

```
void CGImageSourceUpdateDataProvider (
   CGImageSourceRef isrc,
   CGDataProviderRef provider,
   bool final
);
```

Parameters

isrc

An image source.

provider

The new data provider. The new data provider must provide all the previous data supplied to the image source plus any additional new data.

final

A value that specifies whether the data is the final set. Pass `true` if it is, `false` otherwise.

Availability

Available in Mac OS X version 10.4 and later.

Declared In

`CGImageSource.h`

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Data Types

CGImageSourceRef

An opaque type that represents an image source.

```
typedef struct CGImageSource *CGImageSourceRef;
```

Availability
Available in Mac OS X v10.4 and later.

Declared In
`CGImageSource.h`

Constants

Image Source Status

Status states for images and image sources.

```
enum CGImageSourceStatus {
    kCGImageStatusUnexpectedEOF = -5,
    kCGImageStatusInvalidData = -4,
    kCGImageStatusUnknownType = -3,
    kCGImageStatusReadingHeader = -2,
    kCGImageStatusIncomplete = -1,
    kCGImageStatusComplete = 0
};
typedef enum CGImageSourceStatus CGImageSourceStatus;
```

Constants

`kCGImageStatusUnexpectedEOF`
The end of the file was encountered unexpectedly.
Available in Mac OS X v10.4 and later.
Declared in `CGImageSource.h`.

`kCGImageStatusInvalidData`
The data is not valid.
Available in Mac OS X v10.4 and later.
Declared in `CGImageSource.h`.

`kCGImageStatusUnknownType`
The image is an unknown type.
Available in Mac OS X v10.4 and later.
Declared in `CGImageSource.h`.

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`kCGImageStatusReadingHeader`
In the process of reading the header.

Available in Mac OS X v10.4 and later.

Declared in `CGImageSource.h`.

`kCGImageStatusIncomplete`
The operation is not complete

Available in Mac OS X v10.4 and later.

Declared in `CGImageSource.h`.

`kCGImageStatusComplete`
The operation is complete.

Available in Mac OS X v10.4 and later.

Declared in `CGImageSource.h`.

Discussion
These status values are returned by the functions `CGImageSourceGetStatus` (page 26) and `CGImageSourceGetStatusAtIndex` (page 26).

Declared In
`CGImageSource.h`

Image Source Option Dictionary Keys

Keys that you can include in the options dictionary to create an image source.

```
CFStringRef kCGImageSourceTypeIdentifierHint;
CFStringRef kCGImageSourceShouldAllowFloat;
CFStringRef kCGImageSourceShouldCache;
CFStringRef kCGImageSourceCreateThumbnailFromImageIfAbsent;
CFStringRef kCGImageSourceCreateThumbnailFromImageAlways;
CFStringRef kCGImageSourceThumbnailMaxPixelSize;
CFStringRef kCGImageSourceCreateThumbnailWithTransform
```

Constants
`kCGImageSourceTypeIdentifierHint`
The best guess of the uniform type identifier (UTI) for the format of the image source file. If specified, the value of this key must be a CFString object. This key can be provided in the options dictionary when you create a CGImageSource object.

Available in Mac OS X v10.4 and later.

Declared in `CGImageSource.h`.

`kCGImageSourceShouldAllowFloat`
Whether the image should be returned as a CGImage object that uses floating-point values, if supported by the file format. CGImage objects that use extended-range floating-point values may require additional processing to render in a pleasing manner. The value of this key must be a CFBoolean value. The default value is `kCFBooleanFalse`.

Available in Mac OS X v10.4 and later.

Declared in `CGImageSource.h`.

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`kCGImageSourceShouldCache`
: Whether the image should be cached in a decoded form. The value of this key must be a CFBoolean value. The default value is `kCFBooleanTrue`. This key can be provided in the options dictionary that you can pass to the functions `CGImageSourceCopyPropertiesAtIndex` (page 21) and `CGImageSourceCreateImageAtIndex` (page 22).

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageSource.h`.

`kCGImageSourceCreateThumbnailFromImageIfAbsent`
: Whether a thumbnail should be automatically created for an image if a thumbnail isn't present in the image source file. The thumbnail is created from the full image, subject to the limit specified by `kCGImageSourceThumbnailMaxPixelSize`. If a maximum pixel size isn't specified, then the thumbnail is the size of the full image, which in most cases is not desirable. This key must be a CFBoolean value. The default value is `kCFBooleanFalse`. This key can be provided in the options dictionary that you pass to the function `CGImageSourceCreateThumbnailAtIndex` (page 23).

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageSource.h`.

`kCGImageSourceCreateThumbnailFromImageAlways`
: Whether a thumbnail should be created from the full image even if a thumbnail is present in the image source file. The thumbnail is created from the full image, subject to the limit specified by `kCGImageSourceThumbnailMaxPixelSize`. If a maximum pixel size isn't specified, then the thumbnail is the size of the full image, which probably isn't what you want. This key must be a CFBoolean value. The default value is `kCFBooleanFalse`. This key can be provided in the options dictionary that you can pass to the function `CGImageSourceCreateThumbnailAtIndex` (page 23).

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageSource.h`.

`kCGImageSourceThumbnailMaxPixelSize`
: The maximum width and height in pixels of a thumbnail. If this key is not specified, the width and height of a thumbnail is not limited and thumbnails may be as big as the image itself. If present, this key must be a CFNumber value. This key can be provided in the options dictionary that you pass to the function `CGImageSourceCreateThumbnailAtIndex` (page 23).

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageSource.h`.

`kCGImageSourceCreateThumbnailWithTransform`
: Whether the thumbnail should be rotated and scaled according to the orientation and pixel aspect ratio of the full image. The value of this key must be a CFBoolean value. The default value is `kCFBooleanFalse`.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageSource.h`.

Discussion

Except for `kCGImageSourceTypeIdentifierHint`, which you use when creating an image source, these constants specify options that you can set when creating an image from image source. Each constant is a key; you must supply the appropriate value when you add this option to the options dictionary.

Declared In

`CGImageSource.h`

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Other References

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CGImageProperties Reference

Framework: ApplicationServices/ImageIO

Declared in CGImageProperties.h

Overview

CGImageProperties Reference defines constants that represent characteristics of images used by the Image I/O framework.

Constants

Format-Specific Dictionaries

Properties that have an associated dictionary of file-format or metadata-format specific key-value pairs.

```
CFStringRef kCGImagePropertyTIFFDictionary;
CFStringRef kCGImagePropertyGIFDictionary;
CFStringRef kCGImagePropertyJFIFDictionary;
CFStringRef kCGImagePropertyExifDictionary;
CFStringRef kCGImagePropertyPNGDictionary;
CFStringRef kCGImagePropertyIPTCDictionary;
CFStringRef kCGImagePropertyGPSDictionary;
CFStringRef kCGImagePropertyRawDictionary;
CFStringRef kCGImagePropertyCIFFDictionary;
CFStringRef kCGImageProperty8BIMDictionary;
CFStringRef kCGImagePropertyDNGDictionary;
CFStringRef kCGImagePropertyExifAuxDictionary;
```

Constants

`kCGImagePropertyTIFFDictionary`

A dictionary of key-value pairs for an image that uses Tagged Image File Format (TIFF). See "TIFF Dictionary Keys" (page 62).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGIFDictionary`

A dictionary of key-value pairs for an image that uses Graphics Interchange Format (GIF). See "GIF Dictionary Keys" (page 50).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyJFIFDictionary`
A dictionary of key-value pairs for an image that uses JPEG File Interchange Format (JFIF). See "JFIF Dictionary Keys" (page 60).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifDictionary`
A dictionary of key-value pairs for an image that uses Exchangeable Image File Format (EXIF). See "EXIF Dictionary Keys" (page 41).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyPNGDictionary`
A dictionary of key-value pairs for an image that uses Portable Network Graphics (PNG) format. See "PNG Dictionary Keys" (page 61).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCDictionary`
A dictionary of key-value pairs for an image that uses International Press Telecommunications Council (IPTC) metadata. See "IPTC Dictionary Keys" (page 54).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDictionary`
A dictionary of key-value pairs for an image that has Global Positioning System (GPS) information. See "GPS Dictionary Keys" (page 50).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyRawDictionary`
A dictionary of key-value pairs for an image that contains minimally processed, or raw, data.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFDictionary`
A dictionary of key-value pairs for an image that uses Camera Image File Format (CIFF). See "CIFF Dictionary Keys" (page 66).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImageProperty8BIMDictionary`
A dictionary of key-value pairs for an Adobe Photoshop image. See "8BIM Dictionary Keys" (page 66).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDNGDictionary`
A dictionary of key-value pairs for an image that uses the Digital Negative (DNG) archival format. See "DNG Dictionary Keys" (page 65).

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifAuxDictionary`
An auxiliary dictionary of key-value pairs for an image that uses Exchangeable Image File Format (EXIF).

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Discussion
If any of these constants are returned by the functions`CGImageSourceCopyProperties` (page 20) or `CGImageSourceCopyPropertiesAtIndex` (page 21) the associated value is a dictionary of file-format or metadata-format specific key-value pairs.

Declared In
`CGImageProperties.h`

Camera Maker Dictionaries

Properties that have an associated dictionary of key-value pairs for a specific camera manufacturer.

```
CFStringRef kCGImagePropertyMakerCanonDictionary;
CFStringRef kCGImagePropertyMakerNikonDictionary;
CFStringRef kCGImagePropertyMakerMinoltaDictionary;
CFStringRef kCGImagePropertyMakerFujiDictionary;
CFStringRef kCGImagePropertyMakerOlympusDictionary;
CFStringRef kCGImagePropertyMakerPentaxDictionary;
```

Constants
`kCGImagePropertyMakerCanonDictionary`
A dictionary of key-value pairs for an image from a Canon camera. See "Canon Camera Dictionary Keys" (page 71).

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonDictionary`
A dictionary of key-value pairs for an image from a Nikon camera. See "Nikon Camera Dictionary Keys" (page 68).

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerMinoltaDictionary`
A dictionary of key-value pairs for an image from a Minolta camera.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerFujiDictionary`
A dictionary of key-value pairs for an image from a Fuji camera.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerOlympusDictionary`
A dictionary of key-value pairs for an image from a Olympus camera.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyMakerPentaxDictionary`
A dictionary of key-value pairs for an image from a Pentax camera.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

Image Source Container Properties

Properties that apply to the container in general but not necessarily to any individual image in the container.

```
CFStringRef kCGImagePropertyFileSize;
```

Constants
`kCGImagePropertyFileSize`
The size of the image file in bytes, if known. If present, this key is a `CFNumber` value.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

Discussion
These properties can be returned by the function `CGImageSourceCopyProperties` (page 20).

Declared In
`CGImageProperties.h`

Individual Image Properties

Properties that apply to an individual image in an image source.

```
CFStringRef kCGImagePropertyDPIHeight;
CFStringRef kCGImagePropertyDPIWidth;
CFStringRef kCGImagePropertyPixelWidth;
CFStringRef kCGImagePropertyPixelHeight;
CFStringRef kCGImagePropertyDepth;
CFStringRef kCGImagePropertyOrientation;
CFStringRef kCGImagePropertyIsFloat;
CFStringRef kCGImagePropertyIsIndexed;
CFStringRef kCGImagePropertyHasAlpha;
CFStringRef kCGImagePropertyColorModel;
CFStringRef kCGImagePropertyProfileName;
```

Constants
`kCGImagePropertyDPIHeight`
The resolution, in dots per inch, in the x dimension. If present, this key is a `CFNumber` value.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDPIWidth`
The resolution, in dots per inch, in the y dimension. If present, this key is a `CFNumber` value.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyPixelWidth`
The number of pixels in the x dimension. If present, this key is a `CFNumber` value.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyPixelHeight`
The number of pixels in the y dimension. If present, this key is a `CFNumber` value.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDepth`
The number of bits in each color sample of each pixel. If present, this key is a `CFNumber` value.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyOrientation`
The intended display orientation of the image. If present, this key is a `CFNumber` value with the same value as defined by the TIFF and EXIF specifications. The value specifies where the origin `(0,0)` of the image is locates, as shown in Table 3-1. If not present, a value of 1 is assumed.

Table 3-1

Value	Location of the origin of the image
1	Top, left
2	Top, right
3	Bottom, right
4	Bottom, left
5	Left, top
6	Right, top
7	Right, bottom
8	Left, bottom

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIsFloat`
Whether or not the image contains floating-point pixel samples. The value of this key is `kCFBooleanTrue` if the image contains them.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIsIndexed`
Whether or not the image contains indexed pixel samples (sometimes called paletted samples). The value of this key is `kCFBooleanTrue` if the image contains them.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyHasAlpha`
: Whether or not the image has an alpha channel. The value of this key is `kCFBooleanTrue` if the image contains an alpha channel.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageProperties.h`.

`kCGImagePropertyColorModel`
: The color model of the image such as, "RGB", "CMYK", "Gray", or "Lab". The value of this key is CFStringRef.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageProperties.h`.

`kCGImagePropertyProfileName`
: The name of the optional ICC profile embedded in the image, if known. If present, the value of this key is a CFStringRef.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageProperties.h`.

Discussion
These properties can be returned by the function `CGImageSourceCopyPropertiesAtIndex` (page 21).

Declared In
`CGImageProperties.h`

Color Model Values

Values for the color model property.

```
const CFStringRef kCGImagePropertyColorModelRGB;
const CFStringRef kCGImagePropertyColorModelGray;
const CFStringRef kCGImagePropertyColorModelCMYK;
const CFStringRef kCGImagePropertyColorModelLab;
```

Constants
`kCGImagePropertyColorModelRGB`
: An RGB color model.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageProperties.h`.

`kCGImagePropertyColorModelGray`
: A Gray color model.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageProperties.h`.

`kCGImagePropertyColorModelCMYK`
: A CMYK color model.

  Available in Mac OS X v10.4 and later.

  Declared in `CGImageProperties.h`.

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`kCGImagePropertyColorModelLab`

A Lab color model.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

Discussion
A color model describes how color values are represented mathematically. A color space is a color model combined with a definition of how to interpret values within the model.

Declared In
`CGImageProperties.h`

EXIF Dictionary Keys

Keys for for an image that uses Exchangeable Image File Format (EXIF).

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```
const CFStringRef kCGImagePropertyExifExposureTime;
const CFStringRef kCGImagePropertyExifFNumber;
const CFStringRef kCGImagePropertyExifExposureProgram;
const CFStringRef kCGImagePropertyExifSpectralSensitivity;
const CFStringRef kCGImagePropertyExifISOSpeedRatings;
const CFStringRef kCGImagePropertyExifOECF;
const CFStringRef kCGImagePropertyExifVersion;
const CFStringRef kCGImagePropertyExifDateTimeOriginal;
const CFStringRef kCGImagePropertyExifDateTimeDigitized;
const CFStringRef kCGImagePropertyExifComponentsConfiguration;
const CFStringRef kCGImagePropertyExifCompressedBitsPerPixel;
const CFStringRef kCGImagePropertyExifShutterSpeedValue;
const CFStringRef kCGImagePropertyExifApertureValue;
const CFStringRef kCGImagePropertyExifBrightnessValue;
const CFStringRef kCGImagePropertyExifExposureBiasValue;
const CFStringRef kCGImagePropertyExifMaxApertureValue;
const CFStringRef kCGImagePropertyExifSubjectDistance;
const CFStringRef kCGImagePropertyExifMeteringMode;
const CFStringRef kCGImagePropertyExifLightSource;
const CFStringRef kCGImagePropertyExifFlash;
const CFStringRef kCGImagePropertyExifFocalLength;
const CFStringRef kCGImagePropertyExifSubjectArea;
const CFStringRef kCGImagePropertyExifMakerNote;
const CFStringRef kCGImagePropertyExifUserComment;
const CFStringRef kCGImagePropertyExifSubsecTime;
const CFStringRef kCGImagePropertyExifSubsecTimeOrginal;
const CFStringRef kCGImagePropertyExifSubsecTimeDigitized;
const CFStringRef kCGImagePropertyExifFlashPixVersion;
const CFStringRef kCGImagePropertyExifColorSpace;
const CFStringRef kCGImagePropertyExifPixelXDimension;
const CFStringRef kCGImagePropertyExifPixelYDimension;
const CFStringRef kCGImagePropertyExifRelatedSoundFile;
const CFStringRef kCGImagePropertyExifFlashEnergy;
const CFStringRef kCGImagePropertyExifSpatialFrequencyResponse;
const CFStringRef kCGImagePropertyExifFocalPlaneXResolution;
const CFStringRef kCGImagePropertyExifFocalPlaneYResolution;
const CFStringRef kCGImagePropertyExifFocalPlaneResolutionUnit;
const CFStringRef kCGImagePropertyExifSubjectLocation;
const CFStringRef kCGImagePropertyExifExposureIndex;
const CFStringRef kCGImagePropertyExifSensingMethod;
const CFStringRef kCGImagePropertyExifFileSource;
const CFStringRef kCGImagePropertyExifSceneType;
const CFStringRef kCGImagePropertyExifCFAPattern;
const CFStringRef kCGImagePropertyExifCustomRendered;
const CFStringRef kCGImagePropertyExifExposureMode;
const CFStringRef kCGImagePropertyExifWhiteBalance;
const CFStringRef kCGImagePropertyExifDigitalZoomRatio;
const CFStringRef kCGImagePropertyExifFocalLenIn35mmFilm;
const CFStringRef kCGImagePropertyExifSceneCaptureType;
const CFStringRef kCGImagePropertyExifGainControl;
const CFStringRef kCGImagePropertyExifContrast;
const CFStringRef kCGImagePropertyExifSaturation;
const CFStringRef kCGImagePropertyExifSharpness;
const CFStringRef kCGImagePropertyExifDeviceSettingDescription;
const CFStringRef kCGImagePropertyExifSubjectDistRange;
const CFStringRef kCGImagePropertyExifImageUniqueID;
const CFStringRef kCGImagePropertyExifGamma;
```


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Constants

`kCGImagePropertyExifExposureTime`
The exposure time.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFNumber`
The F number.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifExposureProgram`
The exposure program.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSpectralSensitivity`
The spectral sensitivity of each channel.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifISOSpeedRatings`
ISO speed ratings.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifOECF`
The opto-electrical conversion function (OECF), which defines the relationship between the optical input of the camera and the image values.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifVersion`
The version.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifDateTimeOriginal`
The original date and time.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifDateTimeDigitized`
The digitized date and time.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifComponentsConfiguration`
The components configuration. For compressed data, specifies that the channels of each component are arranged in increasing numeric order (from first component to the fourth).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifCompressedBitsPerPixel`
The compressed bits per pixel.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifShutterSpeedValue`
The shutter speed value.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifApertureValue`
The aperture value.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifBrightnessValue`
The brightness value.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifExposureBiasValue`
The exposure bias value.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifMaxApertureValue`
The maximum aperture value.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubjectDistance`
The distance to the subject, in meters.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifMeteringMode`
The metering mode.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifLightSource`
The light source.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFlash`
The flash status when the image was shot.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifFocalLength`
The focal length.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubjectArea`
The subject area.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifMakerNote`
A maker note.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifUserComment`
A user comment.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubsecTime`
The fraction of seconds for the date and time tag.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubsecTimeOrginal`
The fraction of seconds for the original date and time tag.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubsecTimeDigitized`
The fraction of seconds for the digitized time tag.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFlashPixVersion`
The FlashPix version supported by an FPXR file. FlashPix is a format for multi-resolution, tiled images, that facilitates fast onscreen viewing.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifColorSpace`
The color space.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifPixelXDimension`
The pixel x dimension.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifPixelYDimension`
The pixel y dimension.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifRelatedSoundFile`
A related sound file.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFlashEnergy`
The strobe energy when the image was captures, in beam candle power seconds.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSpatialFrequencyResponse`
The spatial frequency table and spatial frequency response values in the direction of image width, image height, and diagonal directions. See ISO 12233..

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFocalPlaneXResolution`
The number of image-width pixels (x) per focal plane resolution unit.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFocalPlaneYResolution`
The number of image-height pixels (y)per focal plane resolution unit.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFocalPlaneResolutionUnit`
The unit of measurement for the focal plane x and y tags.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubjectLocation`
The location of the scene's primary subject.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifExposureIndex`
The selected exposure index.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSensingMethod`
The sensor type of the camera or input device.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifFileSource`
The image source.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSceneType`
The scene type.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifCFAPattern`
The color filter array (CFA) pattern, which is the geometric patter of the image sensor for a 1-chip color sensor area.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifCustomRendered`
Special rendering performed on the image data.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifExposureMode`
The exposure mode setting.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifWhiteBalance`
The white balance mode.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifDigitalZoomRatio`
The digital zoom ratio.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifFocalLenIn35mmFilm`
The equivalent focal length in 35 mm film.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSceneCaptureType`
The scene capture type (standard, landscape, portrait, night).

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyExifGainControl`
The gain adjustment applied to the image.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifContrast`
The contrast applied to the image.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSaturation`
The saturation applied to the image.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSharpness`
The sharpness applied to the image.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifDeviceSettingDescription`
For a particular camera mode, indicates the conditions for taking the picture.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifSubjectDistRange`
The subject distance range.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifImageUniqueID`
The unique ID of the image.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifGamma`
The gamma setting.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

EXIF Auxiliary Dictionary Keys

Auxiliary keys for for an image that uses Exchangeable Image File Format (EXIF).

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```
const CFStringRef kCGImagePropertyExifAuxLensInfo;
const CFStringRef kCGImagePropertyExifAuxLensModel;
const CFStringRef kCGImagePropertyExifAuxSerialNumber;
const CFStringRef kCGImagePropertyExifAuxLensID;
const CFStringRef kCGImagePropertyExifAuxLensSerialNumber;
const CFStringRef kCGImagePropertyExifAuxImageNumber;
const CFStringRef kCGImagePropertyExifAuxFlashCompensation;
const CFStringRef kCGImagePropertyExifAuxOwnerName;
const CFStringRef kCGImagePropertyExifAuxFirmware;
```

Constants

`kCGImagePropertyExifAuxLensInfo`
Lens information.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxLensModel`
The lens model.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxSerialNumber`
The serial number.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxLensID`
The lens ID.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxLensSerialNumber`
The lens serial number.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxImageNumber`
The image number.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxFlashCompensation`
Flash compensation.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyExifAuxOwnerName`
The owner name.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyExifAuxFirmware`
Firmware information.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

GIF Dictionary Keys

Keys for an image that uses Graphics Interchange Format (GIF).

```
const CFStringRef kCGImagePropertyGIFLoopCount;
const CFStringRef kCGImagePropertyGIFDelayTime;
const CFStringRef kCGImagePropertyGIFImageColorMap;
const CFStringRef kCGImagePropertyGIFHasGlobalColorMap;
```

Constants
`kCGImagePropertyGIFLoopCount`
The loop count.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGIFDelayTime`
The delay time.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGIFImageColorMap`
The image color map.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGIFHasGlobalColorMap`
Whether or not the GIF has a global color map.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

GPS Dictionary Keys

Keys for an image that has Global Positioning System (GPS) information.

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```
const CFStringRef kCGImagePropertyGPSVersion;
const CFStringRef kCGImagePropertyGPSLatitudeRef;
const CFStringRef kCGImagePropertyGPSLatitude;
const CFStringRef kCGImagePropertyGPSLongitudeRef;
const CFStringRef kCGImagePropertyGPSLongitude;
const CFStringRef kCGImagePropertyGPSAltitudeRef;
const CFStringRef kCGImagePropertyGPSAltitude;
const CFStringRef kCGImagePropertyGPSTimeStamp;
const CFStringRef kCGImagePropertyGPSSatellites;
const CFStringRef kCGImagePropertyGPSStatus;
const CFStringRef kCGImagePropertyGPSMeasureMode;
const CFStringRef kCGImagePropertyGPSDOP;
const CFStringRef kCGImagePropertyGPSSpeedRef;
const CFStringRef kCGImagePropertyGPSSpeed;
const CFStringRef kCGImagePropertyGPSTrackRef;
const CFStringRef kCGImagePropertyGPSTrack;
const CFStringRef kCGImagePropertyGPSImgDirectionRef;
const CFStringRef kCGImagePropertyGPSImgDirection;
const CFStringRef kCGImagePropertyGPSMapDatum;
const CFStringRef kCGImagePropertyGPSDestLatitudeRef;
const CFStringRef kCGImagePropertyGPSDestLatitude;
const CFStringRef kCGImagePropertyGPSDestLongitudeRef;
const CFStringRef kCGImagePropertyGPSDestLongitude;
const CFStringRef kCGImagePropertyGPSDestBearingRef;
const CFStringRef kCGImagePropertyGPSDestBearing;
const CFStringRef kCGImagePropertyGPSDestDistanceRef;
const CFStringRef kCGImagePropertyGPSDestDistance;
const CFStringRef kCGImagePropertyGPSProcessingMethod;
const CFStringRef kCGImagePropertyGPSAreaInformation;
const CFStringRef kCGImagePropertyGPSDateStamp;
const CFStringRef kCGImagePropertyGPSDifferental;
```

Constants

`kCGImagePropertyGPSVersion`

The version.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSLatitudeRef`

Whether the latitude is northern or southern.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSLatitude`

The latitude.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSLongitudeRef`

Whether the longitude is east or west.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyGPSLongitude`
The longitude.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSAltitudeRef`
The reference altitude.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSAltitude`
The altitude.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSTimeStamp`
The time as UTC (Coordinated Universal Time).
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSSatellites`
The satellites used for GPS measurements.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSStatus`
The status of the GPS receiver.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSMeasureMode`
The measurement mode.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDOP`
The data degree of precision (DOP).
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSSpeedRef`
The unit for expressing the GPS receiver speed of movement.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSSpeed`
The GPS receiver speed of movement.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyGPSTrackRef`
The reference for the direction of GPS receiver movement.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSTrack`
The direction of GPS receiver movement.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSImgDirectionRef`
The reference for the direction of the image.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSImgDirection`
The direction of the image.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSMapDatum`
The geodetic survey data used by the GPS receiver.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestLatitudeRef`
Whether the latitude of the destination point is northern or southern.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestLatitude`
The latitude of the destination point.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestLongitudeRef`
Whether the longitude of the destination point is east or west.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestLongitude`
The longitude of the destination point.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestBearingRef`
The reference for giving the bearing to the destination point.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyGPSDestBearing`
The bearing to the destination point.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestDistanceRef`
The units for expressing the distance to the destination point.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDestDistance`
The distance to the destination point.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSProcessingMethod`
The name of the method used for finding a location.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSAreaInformation`
The name of the GPS area.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDateStamp`
The data and time information relative to Coordinated Universal Time (UTC).
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyGPSDifferental`
Whether differential correction is applied to the GPS receiver.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

IPTC Dictionary Keys

Keys for an image that uses International Press Telecommunications Council (IPTC) metadata.

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```
const CFStringRef kCGImagePropertyIPTCObjectTypeReference;
const CFStringRef kCGImagePropertyIPTCObjectAttributeReference;
const CFStringRef kCGImagePropertyIPTCObjectName;
const CFStringRef kCGImagePropertyIPTCEditStatus;
const CFStringRef kCGImagePropertyIPTCEditorialUpdate;
const CFStringRef kCGImagePropertyIPTCUrgency;
const CFStringRef kCGImagePropertyIPTCSubjectReference;
const CFStringRef kCGImagePropertyIPTCCategory;
const CFStringRef kCGImagePropertyIPTCSupplementalCategory;
const CFStringRef kCGImagePropertyIPTCFixtureIdentifier;
const CFStringRef kCGImagePropertyIPTCKeywords;
const CFStringRef kCGImagePropertyIPTCContentLocationCode;
const CFStringRef kCGImagePropertyIPTCContentLocationName;
const CFStringRef kCGImagePropertyIPTCReleaseDate;
const CFStringRef kCGImagePropertyIPTCReleaseTime;
const CFStringRef kCGImagePropertyIPTCExpirationDate;
const CFStringRef kCGImagePropertyIPTCExpirationTime;
const CFStringRef kCGImagePropertyIPTCSpecialInstructions;
const CFStringRef kCGImagePropertyIPTCActionAdvised;
const CFStringRef kCGImagePropertyIPTCReferenceService;
const CFStringRef kCGImagePropertyIPTCReferenceDate;
const CFStringRef kCGImagePropertyIPTCReferenceNumber;
const CFStringRef kCGImagePropertyIPTCDateCreated;
const CFStringRef kCGImagePropertyIPTCTimeCreated;
const CFStringRef kCGImagePropertyIPTCDigitalCreationDate;
const CFStringRef kCGImagePropertyIPTCDigitalCreationTime;
const CFStringRef kCGImagePropertyIPTCOriginatingProgram;
const CFStringRef kCGImagePropertyIPTCProgramVersion;
const CFStringRef kCGImagePropertyIPTCObjectCycle;
const CFStringRef kCGImagePropertyIPTCByline;
const CFStringRef kCGImagePropertyIPTCBylineTitle;
const CFStringRef kCGImagePropertyIPTCCity;
const CFStringRef kCGImagePropertyIPTCSubLocation;
const CFStringRef kCGImagePropertyIPTCProvinceState;
const CFStringRef kCGImagePropertyIPTCCountryPrimaryLocationCode;
const CFStringRef kCGImagePropertyIPTCCountryPrimaryLocationName;
const CFStringRef kCGImagePropertyIPTCOriginalTransmissionReference;
const CFStringRef kCGImagePropertyIPTCHeadline;
const CFStringRef kCGImagePropertyIPTCCredit;
const CFStringRef kCGImagePropertyIPTCSource;
const CFStringRef kCGImagePropertyIPTCCopyrightNotice;
const CFStringRef kCGImagePropertyIPTCContact;
const CFStringRef kCGImagePropertyIPTCCaptionAbstract;
const CFStringRef kCGImagePropertyIPTCWriterEditor;
const CFStringRef kCGImagePropertyIPTCImageType;
const CFStringRef kCGImagePropertyIPTCImageOrientation;
const CFStringRef kCGImagePropertyIPTCLanguageIdentifier;
const CFStringRef kCGImagePropertyIPTCStarRating;
```

Constants

`kCGImagePropertyIPTCObjectTypeReference`

The object type.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyIPTCObjectAttributeReference`
The object attribute.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCObjectName`
The object name.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCEditStatus`
The edit status.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCEditorialUpdate`
An editorial update.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCUrgency`
The urgency level.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCSubjectReference`
The subject.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCCategory`
The category.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCSupplementalCategory`
A supplemental category.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCFixtureIdentifier`
A fixture identifier.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCKeywords`
Keywords.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyIPTCContentLocationCode`
The content location code.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCContentLocationName`
The content location name.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCReleaseDate`
The release date.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCReleaseTime`
The release time.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCExpirationDate`
The expiration date.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCExpirationTime`
The expiration time.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCSpecialInstructions`
Special instructions.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCActionAdvised`
The advised action.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCReferenceService`
The reference service.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCReferenceDate`
The reference date.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyIPTCReferenceNumber`
The reference number.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCDateCreated`
The date created.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCTimeCreated`
The time created.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCDigitalCreationDate`
The digital creation date.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCDigitalCreationTime`
The digital creation time.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCOriginatingProgram`
The originating program.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCProgramVersion`
The program version.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCObjectCycle`
The object cycle.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCByline`
The byline.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCBylineTitle`
The byline title.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyIPTCCity`
The city.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCSubLocation`
The sublocation.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCProvinceState`
The province or state.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCCountryPrimaryLocationCode`
The country primary location code.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCCountryPrimaryLocationName`
The country primary location name.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCOriginalTransmissionReference`
The original transmission reference.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCHeadline`
The headline.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCCredit`
Credit information.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCSource`
The source.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCCopyrightNotice`
The copyright notice.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyIPTCContact`
Contact information.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCCaptionAbstract`
The caption abstract.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCWriterEditor`
The writer or editor.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCImageType`
The image type.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCImageOrientation`
The image orientation.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCLanguageIdentifier`
The language identifier.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyIPTCStarRating`
The star rating.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

Discussion
IPTC constants are metadata elements of the Information Interchange Model (IIM) used to provide information about images. The IIM was developer by the Newspaper Association of America (NAA) and the International Press Telecommunications Council (IPTC).

Declared In
`CGImageProperties.h`

JFIF Dictionary Keys

Keys for an image that uses JPEG File Interchange Format (JFIF).

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```
const CFStringRef kCGImagePropertyJFIFVersion;
const CFStringRef kCGImagePropertyJFIFXDensity;
const CFStringRef kCGImagePropertyJFIFYDensity;
const CFStringRef kCGImagePropertyJFIFDensityUnit;
const CFStringRef kCGImagePropertyJFIFIsProgressive;
```

Constants

`kCGImagePropertyJFIFVersion`
The version.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyJFIFXDensity`
The x density.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyJFIFYDensity`
The y density.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyJFIFDensityUnit`
The density unit.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyJFIFIsProgressive`
Whether or not the image is progressive.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

PNG Dictionary Keys

Keys for an image that uses Portable Network Graphics (PNG) format.

```
const CFStringRef kCGImagePropertyPNGGamma;
const CFStringRef kCGImagePropertyPNGInterlaceType;
const CFStringRef kCGImagePropertyPNGXPixelsPerMeter;
const CFStringRef kCGImagePropertyPNGYPixelsPerMeter;
const CFStringRef kCGImagePropertyPNGsRGBIntent;
const CFStringRef kCGImagePropertyPNGChromaticities;
```

Constants

`kCGImagePropertyPNGGamma`
The gamma value.
Available in Mac OS X v10.4 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyPNGInterlaceType`
The interlace type.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyPNGXPixelsPerMeter`
The number of x pixels per meter.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyPNGYPixelsPerMeter`
The number of y pixels per meter.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyPNGsRGBIntent`
The sRGB intent.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyPNGChromaticities`
The chromaticities.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

TIFF Dictionary Keys

Keys for an image that uses Tagged Image File Format (TIFF).

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```
const CFStringRef kCGImagePropertyTIFFCompression;
const CFStringRef kCGImagePropertyTIFFPhotometricInterpretation;
const CFStringRef kCGImagePropertyTIFFDocumentName;
const CFStringRef kCGImagePropertyTIFFImageDescription;
const CFStringRef kCGImagePropertyTIFFMake;
const CFStringRef kCGImagePropertyTIFFModel;
const CFStringRef kCGImagePropertyTIFFOrientation;
const CFStringRef kCGImagePropertyTIFFXResolution;
const CFStringRef kCGImagePropertyTIFFYResolution;
const CFStringRef kCGImagePropertyTIFFResolutionUnit;
const CFStringRef kCGImagePropertyTIFFSoftware;
const CFStringRef kCGImagePropertyTIFFTransferFunction;
const CFStringRef kCGImagePropertyTIFFDateTime;
const CFStringRef kCGImagePropertyTIFFArtist;
const CFStringRef kCGImagePropertyTIFFHostComputer;
const CFStringRef kCGImagePropertyTIFFCopyright;
const CFStringRef kCGImagePropertyTIFFWhitePoint;
const CFStringRef kCGImagePropertyTIFFPrimaryChromaticities;
```

Constants

`kCGImagePropertyTIFFCompression`

The compression scheme used on the image data.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFPhotometricInterpretation`

The color space of the image data.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFDocumentName`

The document name.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFImageDescription`

The image description.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFMake`

The camera or input device make.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFModel`

A camera or input device model.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFOrientation`

The image orientation.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyTIFFXResolution`
The number of pixels per resolution unit in the image width direction.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFYResolution`
The number of pixels per resolution unit in the image height direction.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFResolutionUnit`
The units of resolution.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFSoftware`
The name and version of the software used for image creation.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFTransferFunction`
The transfer function, in tabular format, used to map pixel components from a nonlinear form into a linear form.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFDateTime`
The date and time.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFArtist`
The artist.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFHostComputer`
The computer or operation system used when the image was created.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFCopyright`
Copyright information.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyTIFFWhitePoint`
The white point.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyTIFFPrimaryChromaticities`
The chromaticities of the primaries of the image.

Available in Mac OS X v10.4 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

DNG Dictionary Keys

Keys for an image that uses the Digital Negative (DNG) archival format.

```
CFStringRef  kCGImagePropertyDNGVersion;
CFStringRef  kCGImagePropertyDNGBackwardVersion;
CFStringRef  kCGImagePropertyDNGUniqueCameraModel;
CFStringRef kCGImagePropertyDNGLocalizedCameraModel;
CFStringRef  kCGImagePropertyDNGCameraSerialNumber;
CFStringRef  kCGImagePropertyDNGLensInfo;
```

Constants
`kCGImagePropertyDNGVersion`
An encoding of the four-tier version number.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDNGBackwardVersion`
The oldest version for which a file is compatible.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDNGUniqueCameraModel`
A unique, nonlocalized name for the camera mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDNGLocalizedCameraModel`
The localized camera model name.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDNGCameraSerialNumber`
The camera serial number.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyDNGLensInfo`
Information about the lens used for the image.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

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8BIM Dictionary Keys

A key for an Adobe Photoshop image.

```
CFStringRef  kCGImageProperty8BIMLayerNames;
```

Constants

`kCGImageProperty8BIMLayerNames`

The layer names for an Adobe Photoshop file.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Declared In

`CGImageProperties.h`

CIFF Dictionary Keys

Keys for an image that uses Camera Image File Format (CIFF).

```
CFStringRef  kCGImagePropertyCIFFDescription;
CFStringRef  kCGImagePropertyCIFFFirmware;
CFStringRef  kCGImagePropertyCIFFOwnerName;
CFStringRef  kCGImagePropertyCIFFImageName;
CFStringRef  kCGImagePropertyCIFFImageFileName;
CFStringRef  kCGImagePropertyCIFFReleaseMethod;
CFStringRef  kCGImagePropertyCIFFReleaseTiming;
CFStringRef  kCGImagePropertyCIFFRecordID;
CFStringRef  kCGImagePropertyCIFFSelfTimingTime;
CFStringRef  kCGImagePropertyCIFFCameraSerialNumber;
CFStringRef  kCGImagePropertyCIFFImageSerialNumber;
CFStringRef  kCGImagePropertyCIFFContinuousDrive;
CFStringRef  kCGImagePropertyCIFFFocusMode;
CFStringRef  kCGImagePropertyCIFFMeteringMode;
CFStringRef  kCGImagePropertyCIFFShootingMode;
CFStringRef  kCGImagePropertyCIFFLensMaxMM;
CFStringRef  kCGImagePropertyCIFFLensMinMM;
CFStringRef  kCGImagePropertyCIFFLensModel;
CFStringRef  kCGImagePropertyCIFFWhiteBalanceIndex;
CFStringRef  kCGImagePropertyCIFFFlashExposureComp;
CFStringRef  kCGImagePropertyCIFFMeasuredEV;
```

Constants

`kCGImagePropertyCIFFDescription`

The camera description..

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFFirmware`

The firmware version.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyCIFFOwnerName`
The owner name.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFImageName`
The image name.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFImageFileName`
The image file name.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFReleaseMethod`
The release method.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFReleaseTiming`
The release timing.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFRecordID`
The record ID>
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFSelfTimingTime`
The self timing time.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFCameraSerialNumber`
The camera serial number.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFImageSerialNumber`
The image serial number.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFContinuousDrive`
The continuous drive mode.
Available in Mac OS X v10.5 and later.
Declared in `CGImageProperties.h`.

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`kCGImagePropertyCIFFFocusMode`
The focus mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFMeteringMode`
The metering mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFShootingMode`
The shooting mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFLensMaxMM`
The maximum lens length.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFLensMinMM`
The minimum lens length.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFLensModel`
The lens model.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFWhiteBalanceIndex`
The white balance index.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFFlashExposureComp`
The flash exposure compensation.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyCIFFMeasuredEV`
The measured EV.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

Nikon Camera Dictionary Keys

Keys for an image from a Nikon camera.

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```
CFStringRef  kCGImagePropertyMakerNikonISOSetting;
CFStringRef  kCGImagePropertyMakerNikonColorMode;
CFStringRef  kCGImagePropertyMakerNikonQuality;
CFStringRef  kCGImagePropertyMakerNikonWhiteBalanceMode;
CFStringRef  kCGImagePropertyMakerNikonSharpenMode;
CFStringRef  kCGImagePropertyMakerNikonFocusMode;
CFStringRef  kCGImagePropertyMakerNikonFlashSetting;
CFStringRef  kCGImagePropertyMakerNikonISOSelection;
CFStringRef  kCGImagePropertyMakerNikonFlashExposureComp;
CFStringRef  kCGImagePropertyMakerNikonImageAdjustment;
CFStringRef  kCGImagePropertyMakerNikonLensAdapter;
CFStringRef  kCGImagePropertyMakerNikonLensType;
CFStringRef  kCGImagePropertyMakerNikonLensInfo;
CFStringRef  kCGImagePropertyMakerNikonFocusDistance;
CFStringRef  kCGImagePropertyMakerNikonDigitalZoom;
CFStringRef  kCGImagePropertyMakerNikonShootingMode;
CFStringRef  kCGImagePropertyMakerNikonShutterCount;
CFStringRef  kCGImagePropertyMakerNikonCameraSerialNumber;
```

Constants

`kCGImagePropertyMakerNikonISOSetting`

The ISO setting.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonColorMode`

The color mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonQuality`

The quality setting.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonWhiteBalanceMode`

The white balance mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonSharpenMode`

The sharpening mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonFocusMode`

The focus mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonFlashSetting`

The flash setting.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyMakerNikonISOSelection`
The ISO selection.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonFlashExposureComp`
The flash exposure compensation.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonImageAdjustment`
Image adjustment setting.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonLensAdapter`
The lens adapter.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonLensType`
The lens type.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonLensInfo`
Lens information.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonFocusDistance`
The focus distance.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonDigitalZoom`
The digital zoom setting.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonShootingMode`
The shooting mode.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerNikonShutterCount`
The shutter count.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyMakerNikonCameraSerialNumber`
The camera serial number.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

Canon Camera Dictionary Keys

Keys for an image from a Canon camera.

```
CFStringRef  kCGImagePropertyMakerCanonOwnerName;
CFStringRef  kCGImagePropertyMakerCanonCameraSerialNumber;
CFStringRef  kCGImagePropertyMakerCanonImageSerialNumber;
CFStringRef  kCGImagePropertyMakerCanonFlashExposureComp;
CFStringRef  kCGImagePropertyMakerCanonContinuousDrive;
CFStringRef  kCGImagePropertyMakerCanonLensModel;
CFStringRef  kCGImagePropertyMakerCanonFirmware;
CFStringRef  kCGImagePropertyMakerCanonAspectRatioInfo;
```

Constants
`kCGImagePropertyMakerCanonOwnerName`
The owner name.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerCanonCameraSerialNumber`
The camera serial number.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerCanonImageSerialNumber`
The image serial number.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerCanonFlashExposureComp`
The flash exposure compensation.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerCanonContinuousDrive`
The presence of a continuous drive.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerCanonLensModel`
The lens model.

Available in Mac OS X v10.5 and later.

Declared in `CGImageProperties.h`.

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`kCGImagePropertyMakerCanonFirmware`
: The firmware version.

  Available in Mac OS X v10.5 and later.

  Declared in `CGImageProperties.h`.

`kCGImagePropertyMakerCanonAspectRatioInfo`
: The image aspect ratio.

  Available in Mac OS X v10.5 and later.

  Declared in `CGImageProperties.h`.

Declared In
`CGImageProperties.h`

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Document Revision History

This table describes the changes to *Image I/O Reference Collection*.

Date	Notes
2007-04-09	Newly created collectiion that describes the existing API for reading and writing image data.

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Document Revision History

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