Working with the Image Control

The `ImgControl` widget is a 4D subform that manages a `ImgArea` plug-in area to provide a rich user interface for viewing and manipulating images. This is how it looks with real content and these are its standard interface elements:

The Image Control is implemented in the **Q2ImgControl** component. The Image Control comprises the Menu bar, the Toolbar and the Sidebar. It consists of a 4D subform and a set of related component methods.

These are the steps required to implement the `ImgControl` widget in a 4D form:

- Place the widget and plug-in area objects on the form and properly set up their properties.
- Add some standard code to the form and object methods.
- Use component method calls to assign and retrieve content to and from the widget.

Setting up the form objects

Add a subform object

Use the form editor's subform tool to create a subform object: this will be your `ImgControl` widget.

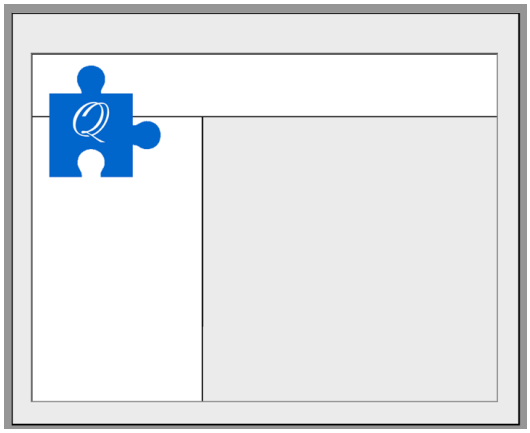
Set the subform's name to something meaningful. The name will be used to address the control with component methods. In this example name the subform `"img_viewer"`.

Set the subform object properties as indicated below:

ImgControl properties		
Object Properties	Type	Subform
	Object Name	img_viewer
	Variable Name	<Blank>
	Variable Type	String
Subform Properties	Output subform	Unchecked
	Detail form	ImgControl
	Automatic Width	Unchecked
Appearance	Horizontal Scroll Bar	Unchecked
	Vertical Scroll Bar	Unchecked
Events	On Load	Checked
	On Unload	Checked

To make the control resizable, adjust the options in the Resizing Options group.

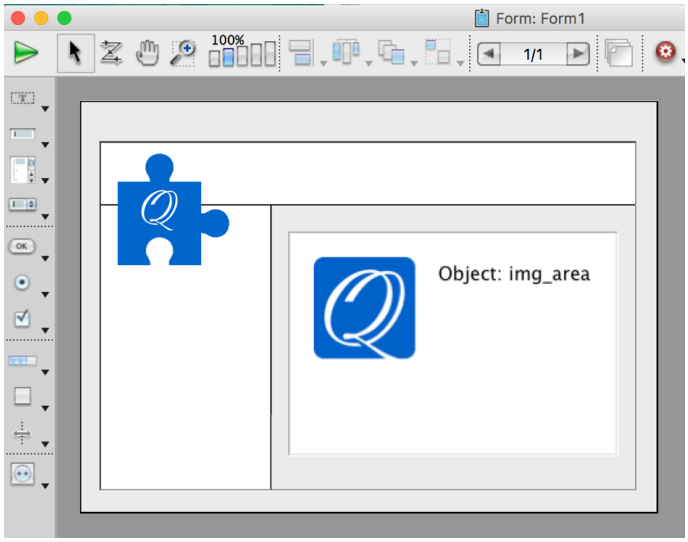
The image control should now look like this:



Add the plug-in area

Use the plug-in area tool to create a plug-in area object over the `ImgControl` widget.

There's no need to align the plug-in area with the subform – it will be properly placed and sized automatically during runtime:



Set the plug-in area name to something meaningful. The name will be used to bind the plug-in area to the `ImgControl` object. In this example name it `"img_area"`.

Set the plug-in area properties as indicated below:

Plug-in area properties		
Object Properties	Type	ImgArea
	Object Name	img_area
	Variable Name	<Blank>
Resizing options	Horizontal Sizing	Grow
	Vertical Sizing	Grow
Events	On Plug in Area	Checked

Configure form events

Make sure that the following events are enabled in the form properties:

Form properties		
Events	On Load	Checked
	On Unload	Checked
	On Timer	Checked
	On Resize	Checked

Add standard code

Now that the `ImgControl` object, plug-in area, and host form are properly set up in the form editor, add the code required for bringing the widget to

life:

- Initialize and cleanup the widget.
- Service plug-in area events and internal `ImgControl` messages.
- Update the widget and plug-in area when the form is resized.
- Manage the `ImgControl` configuration and visibility of its parts.
- Assign content to the widget.

Set the plug-in area method

```
C_LONGINT($event)
$event:=Form event

Case of
   : ($event=On Plug in Area)

      ImgControl_PluginAreaEvent ("img_viewer")

End case
```

The `ImgControl` widget needs to be notified of plug-in area events in order to update its state in response to user actions such as selection with the marquee tool. That's what the **`ImgControl_PluginAreaEvent`** method does.

Set the ImgControl object method

```
C_LONGINT($event)
$event:=Form event

Case of
   : ($event=kImgControlMessage)

      ImgControl_ProcessMessages ("img_viewer")

End case
```

The `ImgControl` widget uses an internal messaging system that lets internal form objects and subforms communicate with code that runs in the context of the host form. The main mechanism for delivering such messages is the `CALL SUBFORM CONTAINER` 4D method.

The **`ImgControl_ProcessMessages`** call lets the widget process any pending messages, a behavior that is vital for its proper operation.

Set the form method

```
C_LONGINT($event)
$event:=Form event

Case of
   : ($event=On Load)

      If (ImgControl_Initialize ("img_viewer";"img_area")=1)

         ImgControl_Setup ("img_viewer")

         // ...
         // ... assign content to the widget
         // ...

      End if

   : ($event=On Unload)

      ImgControl_Finalize ("img_viewer")

   : ($event=On Timer)

      C_LONGINT($msgCount)
      $msgCount:=ImgControl_ProcessMessages ("img_viewer")
      If (($msgCount)=0)
         SET TIMER(0)
      End if

   : ($event=On Resize)

      ImgControl_UpdateLayout ("img_viewer")

End case
```

The call to **ImgControl_Initialize** during the On Load event initializes the ImgControl context and is balanced with **ImgControl_Finalize** during the On Unload event.

Once the ImgControl is initialized, it is set to the default configuration with the call to **ImgControl_Setup**.

The code during the On Timer event services the control's internal messaging system, which is vital for the widget's operation. The timer event is cancelled if there are no pending messages.

During the On Resize event **ImgControl_UpdateLayout** is called to update the control's layout.

Configuration

The ImgControl widget is configured with a 4D object typically coming from a JSON file stored in the database's Resources folder. The configuration object describes the control parts: menubar, toolbar, and sidebar.

The control is typically assigned a configuration during the On Load form event, but can also be reconfigured during runtime. It is possible to change the appearance and functionality of the control dymanically.

The configuration object is assigned to the control by calling either **ImgControl_Setup** or **ImgControl_SetupWithConfig**.

The **ImgControl_Setup** method accepts the configuration object directly as a parameter. If the object parameter is omitted, or an undefined object is passed, the method looks for file Q2Pix/Q2ImgControl/Configs/<object name>.json in the database's Resources folder (<object name> is the name of the subform object). If the file exists, the configuration is loaded from the JSON file. Otherwise, the built-in configuration is loaded from the component's resources (as in the form method above).

The **ImgControl_SetupWithConfig** method accepts the <config name> as a parameter and looks for Q2Pix/Q2ImgControl/Configs/<config name>.json in the host database's Resources folder. If the file exists, the ImgControl configuration is loaded from that file. If not, configuration is delegated to **ImgControl_Setup**.

> **Note:**
>
> The ImgControl widget is still under development. The format of the JSON configuration object and the way in which the control can be customized and extended will be finalized and documented in a subsequent beta. For now have a look at the configuration files in the component and demo database's Resources folder, make a copy, and cut/paste parts to your liking.

The visibility of ImgControl parts can be controlled during runtime with the following methods:

- **ImgControl_IsPartVisible** / **ImgControl_SetPartVisible**
- **ImgControl_IsToolsetVisible** / **ImgControl_SetToolsetVisible**

Assign content

There is a number of component methods for assigning content to the control:

ImgControl_SetDocument
: Set the content using a document reference.

ImgControl_SetImageFile
: Set the content using a file path.

ImgControl_SetImageBLOB
: Set the content using a BLOB.

ImgControl_SetPicture
: Set the content using a picture.

The image frame index can be controlled with **ImgControl_GetFrameIndex** and **ImgControl_SetFrameIndex**.

The image document currently assigned to the control can be retrieved with **ImgControl_GetDocument**.

> **Important:**
>
> Always manage the control's content using one of the above component methods, instead of addressing the ImgArea plug-in area directly! The component methods automatically perform all needed tasks, such as update the internal state of the control, and the user interface.