CSR Synergy Bluetooth 18.2.0

BIPC Basic Imaging Profile Client

Demo Description

November 2011

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CSR Synergy Bluetooth 18.2.0 BIPC Demo Description

1 Basic Imaging Profile (BIP Client)

1.1 Generally

The BIP client example application can be used for image transfer. This demo is running with a CASIRA with RFCOMM-build firmware.

PC

```
┌─────────────┐ ⎫
│ Applicatio  │ ⎬  rfc_bip_client_demo_app.exe
│     ns      │ ⎭
└─────────────┘
       │
┌─────────────┐
│   Casira    │
│             │
└─────────────┘
```
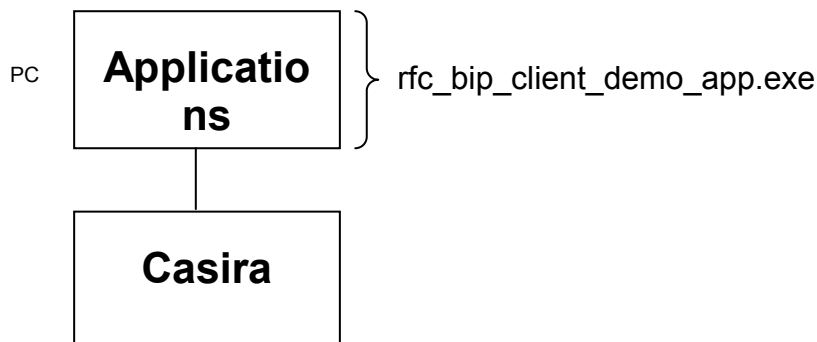
The BIP client program provides the following example functionalities:

- Discovery of remote devices
- Connection management
- Show capability of remote side
- Image Push
- Remote Camera
- Automatic Archive (Server)

The application has been made to run on Windows and Linux and may be connected to the Casira using either a serial connection using BCSP (`rfc_bip_client_demo_app.exe`), a serial connection using H4DS (`rfc_bip_client_demo_app_h4ds.exe`) or an USB connection (`rfc_bip_client_demo_app_usb.exe`), and their HCI equivalents.

The description below is based on the Windows demo application but the description also holds for the Linux Demo Application.

1.2 Use of the rfc_bip_client_demo_app.exe program

Note: This description is for CSR Synergy Bluetooth RFCOMM. The functionality of the application for the HCI build is identical. The only difference is the naming: rfc_bip_client_demo_app.exe versus hci_bip_client_demo_app.exe.

Program invocation:

The following program parameters can be given as command line parameters at program start:

-C port   to specify which COM port the program should use (connected to the Casira). For example, -C COM2, default is COM1. (on Linux default port is /dev/ttyS0).

-B baudrate	to specify which baud rate to use between the PC and Casira. For example, -B 921600, default is 115200.
-A BD addr.	To specify a device address for default, e.g. rfc_bip_client_demo_app.exe –a 0002:5b:01a494. If no address is specified it is necessary to perform a search for servers in order to establish a connection.

The images and the attachments sent by the demo application are placed in a sub-folder (relative to where the program starts) called "bipc_files".

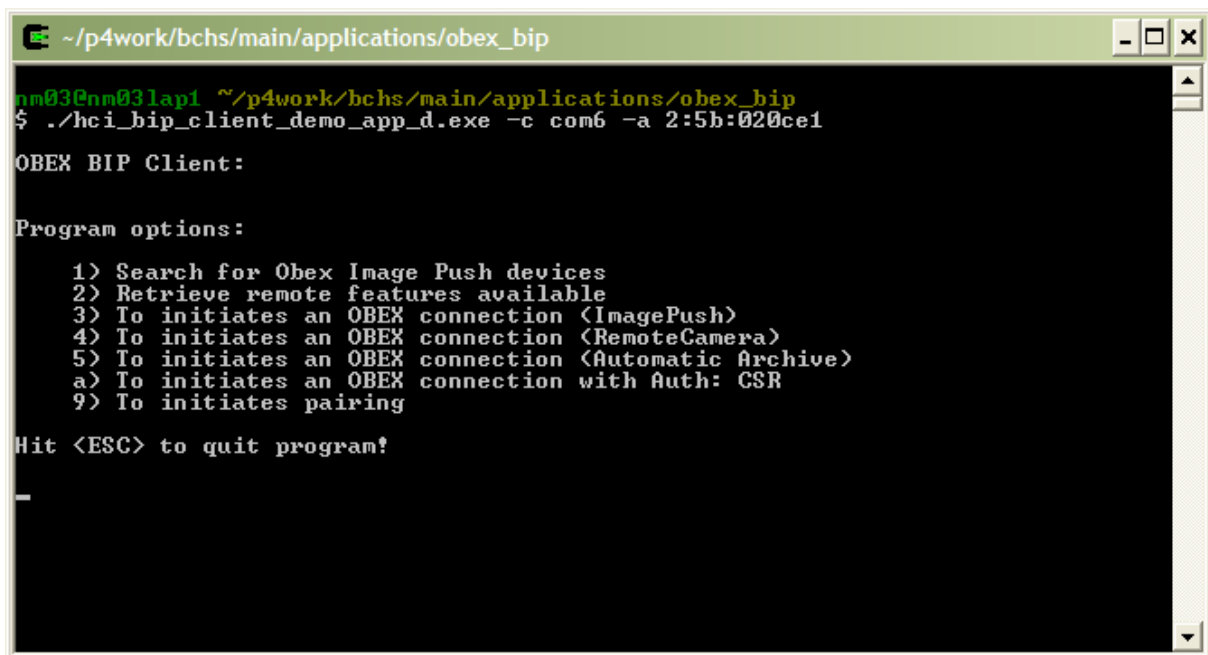Please note that if the default baud rate is used transfers of high resolution pictures will be slow.

Program usage:

The demo is implemented as a simple menu-based terminal program. The demo can be closed (the program aborted) by pressing the ESC key at any time.

The main function of the BIP client demo application is to send pictures to a BIP server. This means that a BIP server is necessary in order to perform the demo.

After starting the BIP client demo application, there are 4 options, as illustrated below:

1) Search for BIP devices. This option is used if the address of the device the connection request is made to is unknown.
2) Retrieve the available BIP features of the peer
3) Initiate an Image Push OBEX connection. This option is used if the address of the device the connection request is made to is already known, e.g. if the '-A' option is specified during application start.

a) Same as option 3, but with OBEX authentication. The password is "CSR" (OBEX authentication is not supported by most devices).

4) Initiate a Remote Camera OBEX connection.

5) Initiate an Automatic Archive OBEX connection.

9) Pairing. To do pairing the address of the device the connection request is made to has to be known (or have searched for devices and selected a default device).

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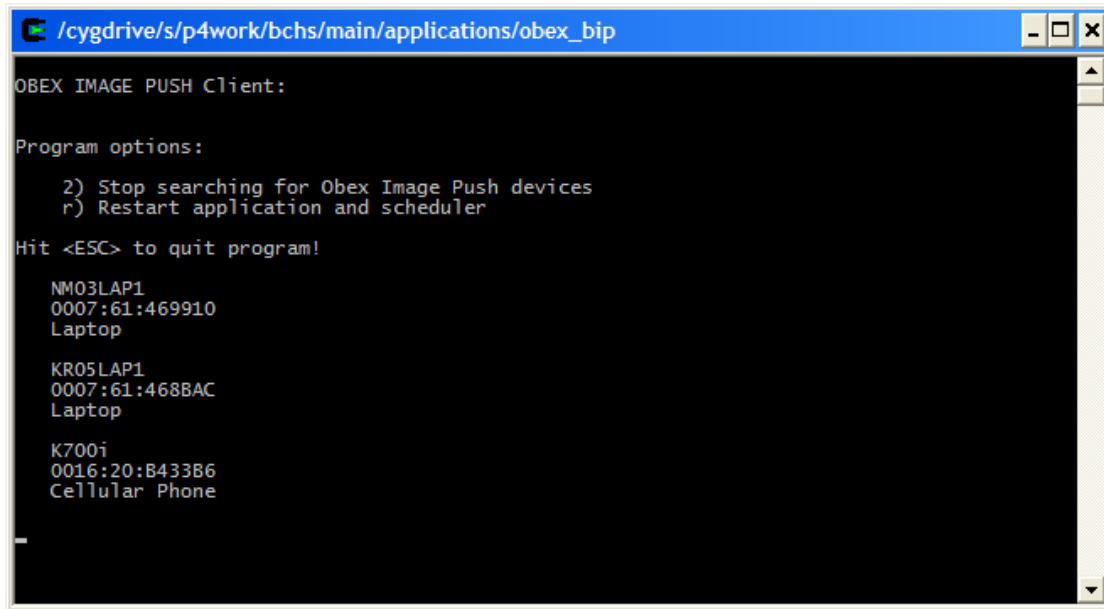
1.3 Search

If the command "1" is selected a list of BIP clients in the area will appear on the screen, as there are found.

The found devices will enumerate on the display when found as illustrated below. The first field in the enumeration is the Bluetooth device address and the second field contains the remote device name.
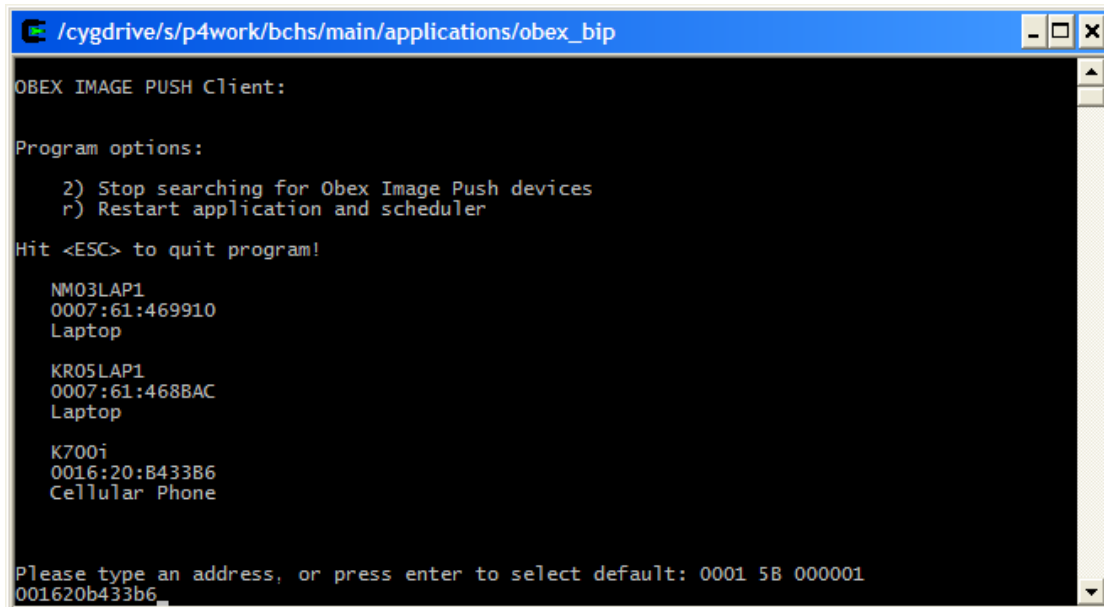
In order to select one of the devices illustrated on the list, press "2" to cancel searching, and wait until the message "Please type an address, or press enter to select default: 0001 5B 000001" appears.

To select device K700i the address for this device must be entered followed by return (see below).

The device with the Bluetooth address 0016 20 B433B6 is now the default device when a connection is made. This will be used when a Bluetooth connection or pairing is made. The application will now return to the main menu.

1.4 Retrieve BIP Features

To retrieve the peers available BIP features, press '2' on the main screen.

When prompted for the Bluetooth address, it is possible to type it directly, but to connect to the default device just press ENTER.

The result is presented as seen on the following screen dumb.

The peer (2:5b:020ce1) supports both 'Image Push', 'Remote Camera', and 'Automatic Archive'. This means we can expect an positive outcome of trying to connect using all features. If a feature is not supported, we can still attempt to connect – but we should expect to have the connection refused. Retrieving the peers supported features is a possibility prior to connecting not a necessity.

1.5 Image Push OBEX Connection

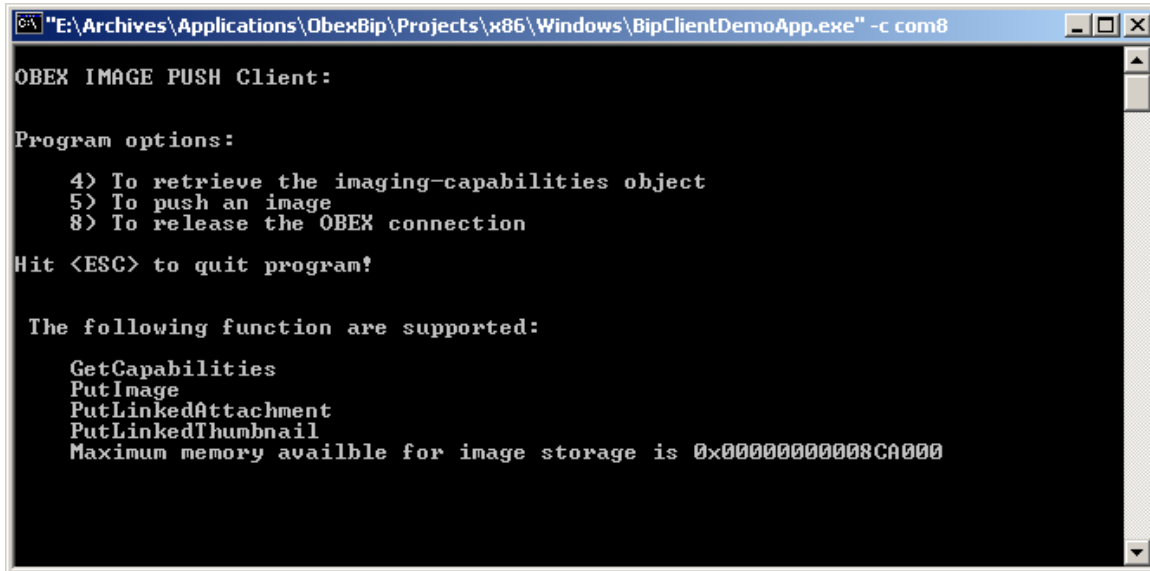To connect using Image Push, press "3" on the main screen.

It is possible to type the Bluetooth address directly, but to connect to the default device just press ENTER.

If a connection is established to the BIP server, it is now possible to:

5) Retrieve the image-capability object from the server.
6) Push an image.
8) Release the connection to the peer device.

The demo application will also show the functions supported by the server.
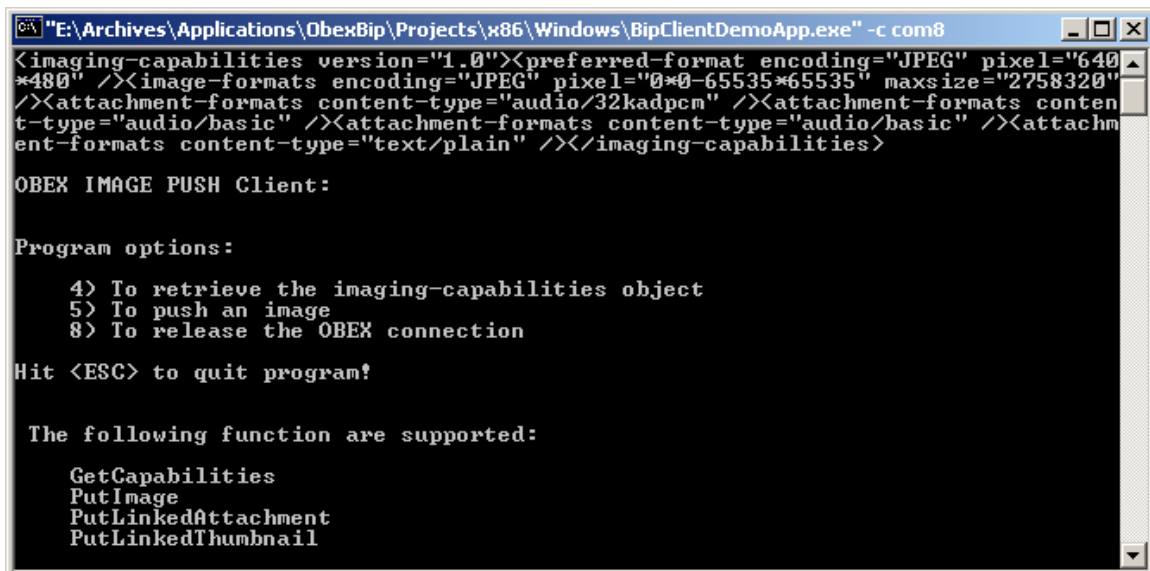
To discover the server's level of support for various imaging capabilities, press "4". The retrieved imaging-capabilities object will then be printed out on the screen, see below.

In this case we can see among other things that the server supports JPEG encoding with a resolution from 0*0 to 65535*65535

To send an image to the server, press "5". A list of the default pictures saved for this demo application will appear. In this example the other side can receive all the default pictures that come with this demo application.

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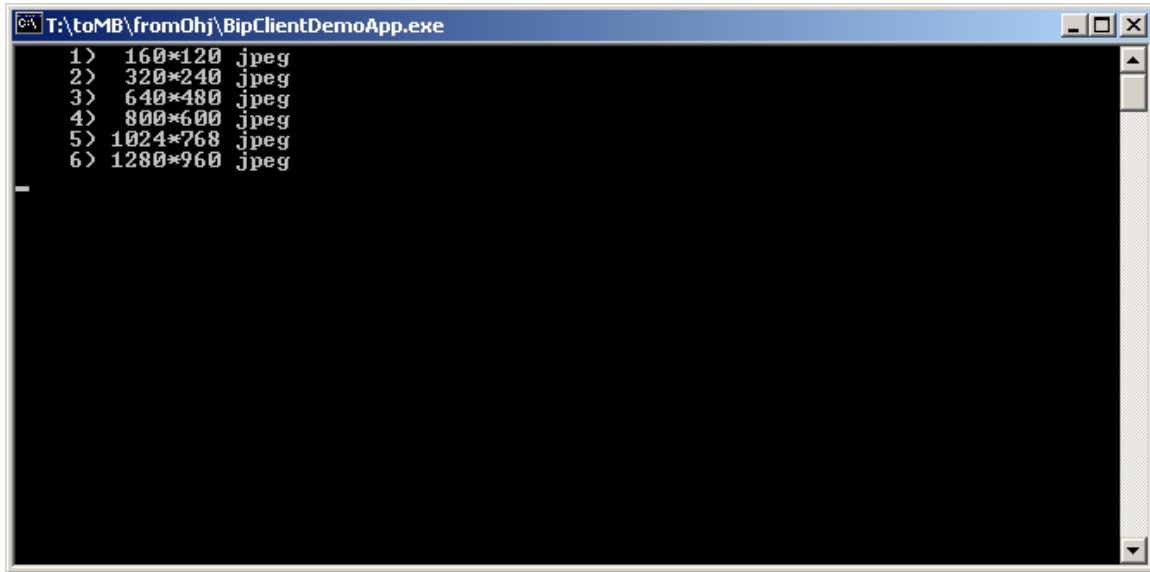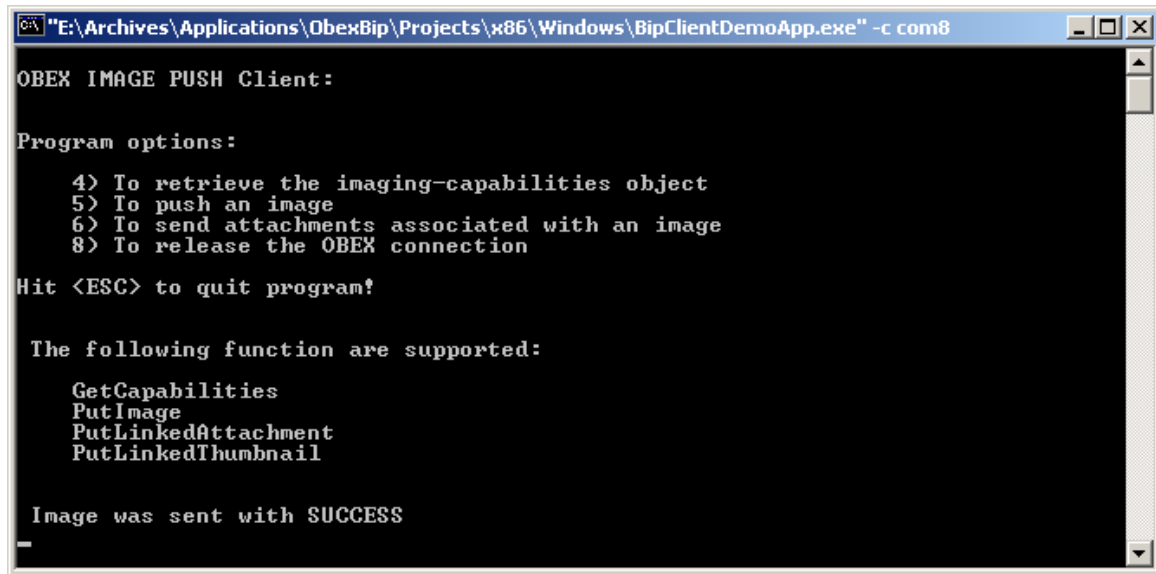
To send a jpeg image, with resolution 1024*768, press "5". Please note that on many PCs the UART speed is the bottleneck. If the UART speed is slow it will take some time to send big pictures. While the demo is transferring the picture it will show which picture it is sending and give an option to abort the operation. Please note that the put image procedure can be aborted by pressing "7"
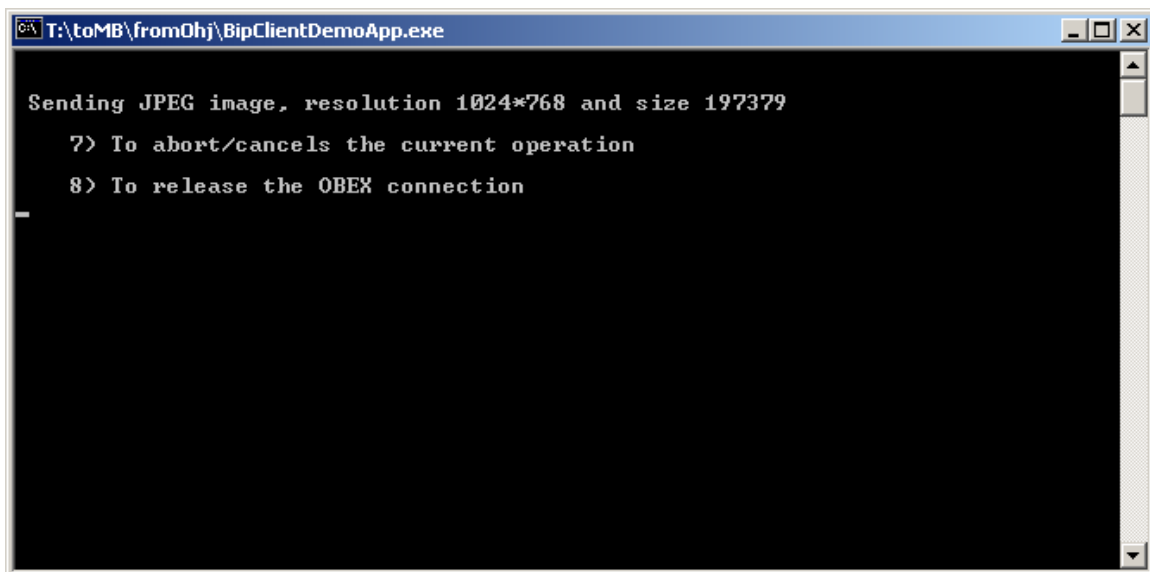
The status of the image transfer will also be shown. In this example the picture transfer is a success, and it is now possible to view it on the server.

After the image is transferred the program will return to the menu where pictures can be sent. Now, it is also possible to send an attachment to the picture.

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To send an attachment associated with an image just sent, press "6". Please note the option of sending an attachment is only shown on the screen if the server supports the PutLinkedAttachment function, and if at least one image is sent with success to the server.

This will give 2 options:

1) Send an audio file (wav file)
2) Send a text file

To send an audio file, press "1". The status of the attachment transfer will also be shown. In this example the transfer of the attachment is a success, and it is now possible to play it on the server.

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```
"E:\Archives\Applications\ObexBip\Projects\x86\Windows\BipClientDemoApp.exe" -c com8

OBEX IMAGE PUSH Client:


Program options:

    4) To retrieve the imaging-capabilities object
    5) To push an image
    6) To send attachments associated with an image
    8) To release the OBEX connection

Hit <ESC> to quit program!


 The following function are supported:

    GetCapabilities
    PutImage
    PutLinkedAttachment
    PutLinkedThumbnail


 Attachment was sent with SUCCESS
_
```
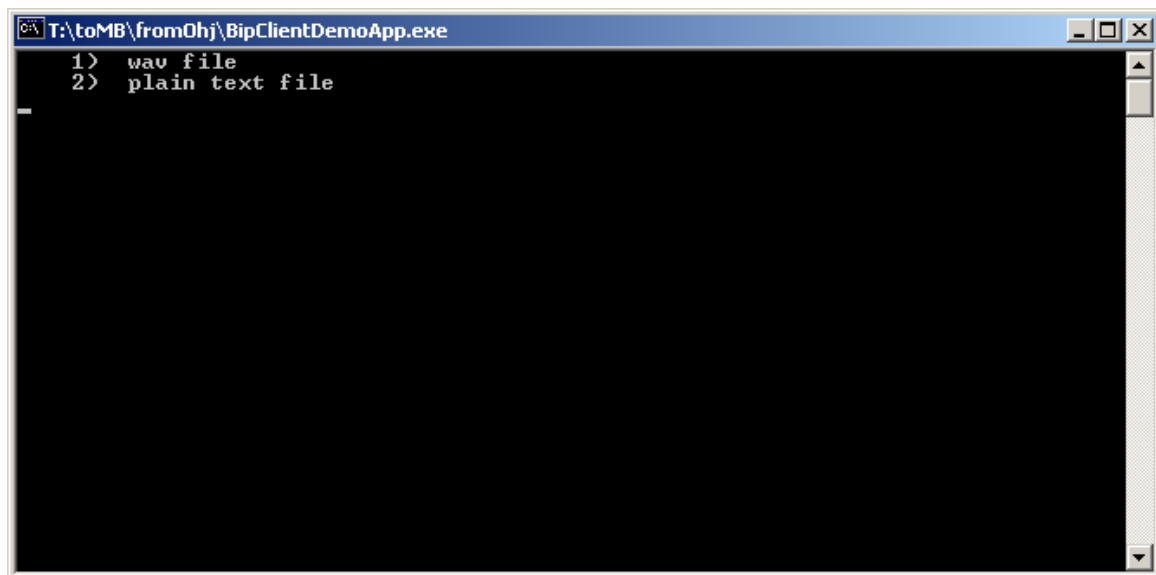
It is now possible to send another attachment associated with the image just sent, to send a new image, retrieve the server's capabilities-object, or to release the OBEX connect by pressing "8". After the OBEX connection is released the main screen illustrated below will appear.

```
"E:\Archives\Applications\ObexBip\Projects\x86\Windows\BipClientDemoApp.exe" -c com8

OBEX IMAGE PUSH Client:


Program options:

    1) Search for Obex Image Push devices
    3) To initiates an OBEX connection
    a) To initiates an OBEX connection with Auth: CSR
    9) To initiates pairing

Hit <ESC> to quit program!

_
```

1.6   Remote Camera OBEX Connection
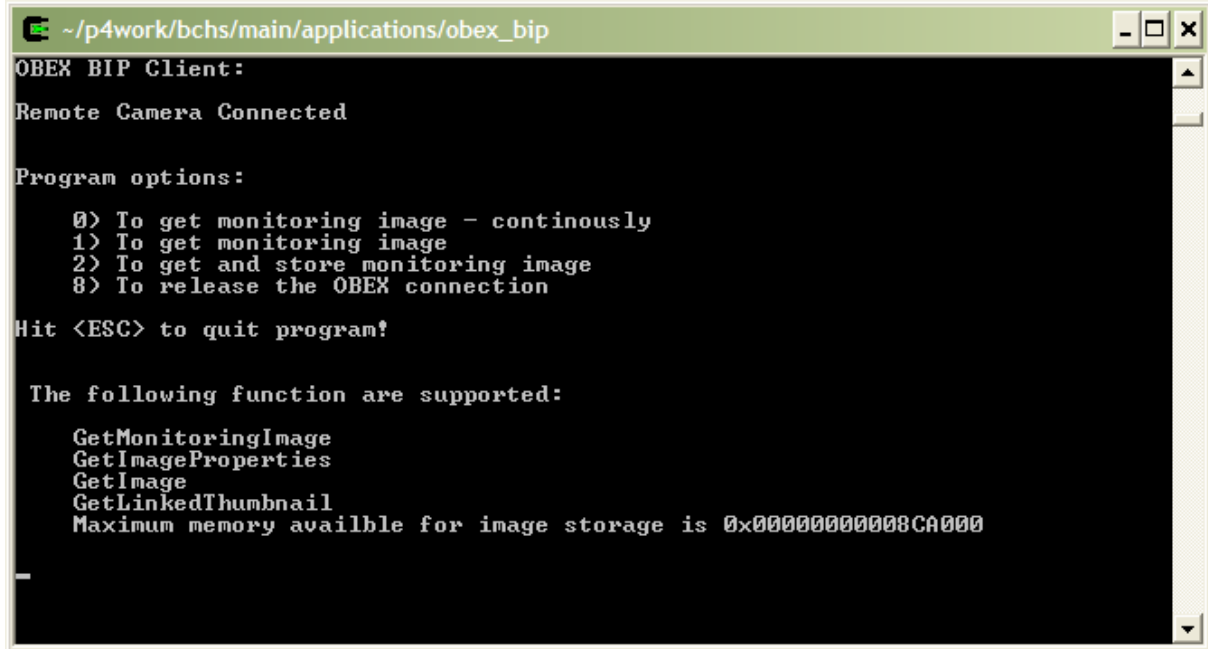
The remote camera BIP feature allows the user to

- get monitoring images and request the server (e.g. camera) to save it, i.e. release the shutter

- get the properties of a saved image

- get a saved image – in various formats if available from the server

- get a thumbnail of a saved image

To connect using Remote Camera, press "4" on the main screen.

When prompted for the Bluetooth address, it is possible to type it directly, but to connect to the default device just press ENTER.

Once connected the following screen appears:

It is now possible to get the monitoring image on demand (1) or continuously as fast as possible (0). To get and store the monitoring image press '2', this will stop the continues mode of getting monitoring images.

To release the OBEX connection press "8".

While we only get the monitoring image the available menu items remain the same. If we ask for a monitoring image to be stored(2), more items appear in the menu:

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```
~/p4work/bchs/main/applications/obex_bip                          _□ x

OBEX BIP Client:

Remote Camera Connected


Program options:

    0) To get monitoring image - continously
    1) To get monitoring image
    2) To get and store monitoring image
    3) To get image properties '0000003'
    4) To get image thumbnail '0000003'
    5) To get image '0000003' using image descriptor
    6) To get image '0000003' with out sending image descriptor
    8) To release the OBEX connection

Hit <ESC> to quit program!


 The following function are supported:

    GetMonitoringImage
    GetImageProperties
    GetImage
    GetLinkedThumbnail

Image transfer complete
```

Now we can also request:

- The image properties (3)

- The thumbnail (4)

- The image, by specifying the format (5)

- The native image (6)

When requesting the image properties (3) we are presented with the result as seen below:

CSR Synergy Bluetooth 18.2.0 BIPC Demo Description

```
 ~/p4work/bchs/main/applications/obex_bip                        _ □ ✕

OBEX BIP Client:

Remote Camera Connected


Program options:

    0) To get monitoring image - continously
    1) To get monitoring image
    2) To get and store monitoring image
    3) To get image properties '0000003'
    4) To get image thumbnail '0000003'
    5) To get image '0000003' using image descriptor
    6) To get image '0000003' with out sending image descriptor
    8) To release the OBEX connection

Hit <ESC> to quit program!


 The following function are supported:

    GetMonitoringImage
    GetImageProperties
    GetImage
    GetLinkedThumbnail


ImageProperties Received

The image-properties is as follows:

version                 : 1.0

native:
encoding                : JPEG
pixel                   : 1136*852
size                    : 74355

variant:
encoding                : JPEG
pixel                   : 640*480

attachment:
content-type            : audio/32kadpcm
name                    : attach.wav
size                    : 39700
```
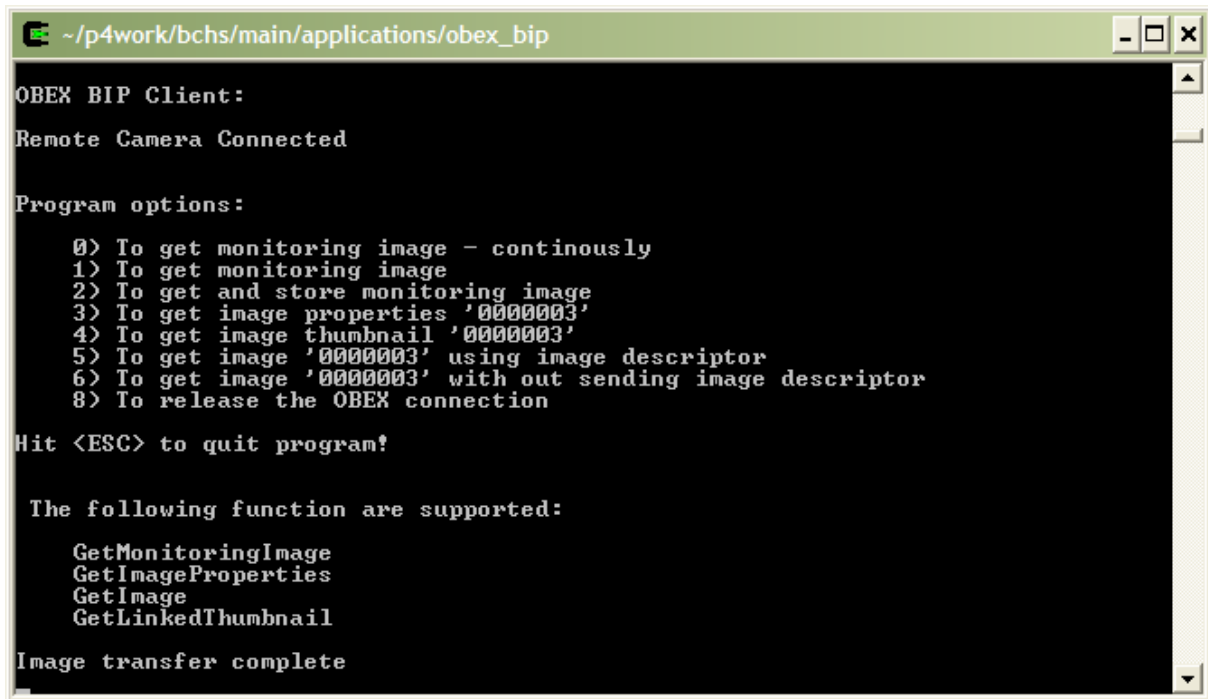
From this we can see that the image with handle '0000003' is available in two formats 1136*852, and 640*480 – both using JPEG as encoding. Furthermore there exists an attachment.

Now we can choose to get the image or continue to get monitoring images. If we want to get the image using an image descriptor (5) we are presented with the following screen:

```
~/p4work/bchs/main/applications/obex_bip
 Please choose image descriptor :
0)  native:
encoding                : JPEG
pixel                   : 1136*852
size                    : 74355

1)  variant:
encoding                : JPEG
pixel                   : 640*480

t) to choose thumbnail (encoding= JPEG pixel= 160*120)
<enter> for no image descriptor
```

Here we need to choose one of the options presented, or press enter to get the native image. If we choose '0' the image is transferred and presented in a viewer, while the screen shows the progress of the image transfer:

```
~/p4work/bchs/main/applications/obex_bip
OBEX BIP Client:

Remote Camera Connected


Program options:

    0) To get monitoring image - continously
    1) To get monitoring image
    2) To get and store monitoring image
    3) To get image properties '0000003'
    4) To get image thumbnail '0000003'
    5) To get image '0000003' using image descriptor
    6) To get image '0000003' with out sending image descriptor
    8) To release the OBEX connection

Hit <ESC> to quit program!


 The following function are supported:

    GetMonitoringImage
    GetImageProperties
    GetImage
    GetLinkedThumbnail


    Retrieving image
Sending:
<image-descriptor version="1.0">
<image encoding="JPEG" pixel="1136*852" size="74355" />
</image-descriptor>
....
```
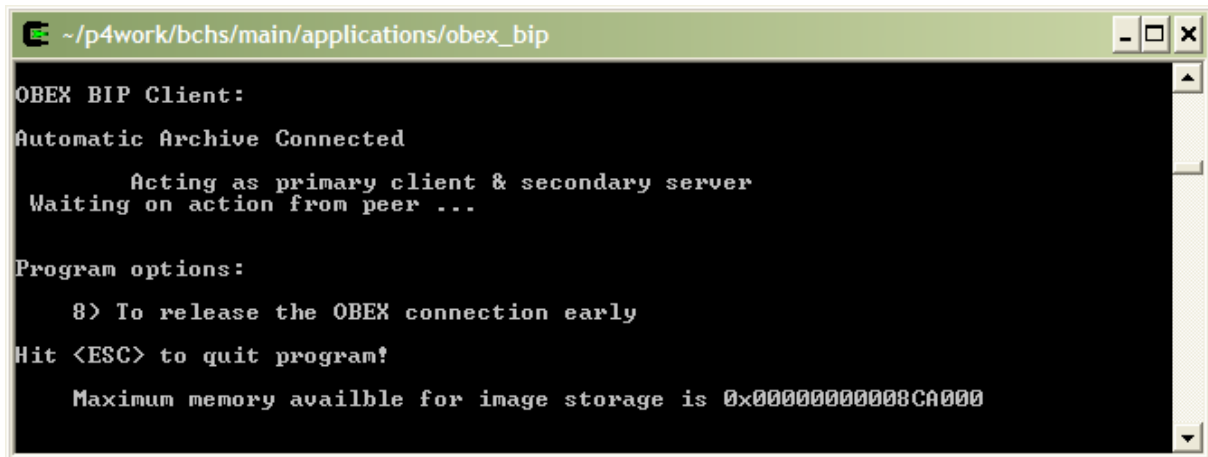
1.7   Automatic Archive OBEX Connection

To connect using Automatic Archive, press "5" on the main screen.

When prompted for the Bluetooth address, it is possible to type it directly, but to connect to the default device just press ENTER.

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When the connection is established the following screen appears:

```
~/p4work/bchs/main/applications/obex_bip

OBEX BIP Client:

Automatic Archive Connected

        Acting as primary client & secondary server
 Waiting on action from peer ...

Program options:

    8) To release the OBEX connection early

Hit <ESC> to quit program!

    Maximum memory availble for image storage is 0x000000000008CA000
```

The only available option – to prematurely release the OBEX connections (8) reflects on the fact that the application now acts as server for the automatic archive feature. This means that the connected peer is client, and therefore also has the initiative.

When information is requested by the client, the application will display information transferred to the peer.

The images used for the automatic archive is located in the folder bip_files. These files are expected to exist, and will not be removed even if the client request this. The server keeps track of available images internally.

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2　Linux

This section describes how to build and run the BIPC demo application on Linux.

The BIPC demo application (pure user space), located in `./applications/obex_bip`, may be compiled on Linux by means of:

> make clean all TARGET_ARCH=Linux-2.6-x86

This will output four files: `hci_bip_client_demo_app,` `hci_bip_client_demo_app_h4ds,` and `hci_bip_client_demo_app_usb,` for serial and USB communication using a HCI split and `rfc_bip_client_demo_app,` `rfc_bip_client_demo_app_h4ds` and `rfc_bip_client_demo_app_usb,` for serial and USB communication using a RFC split.

The demo applications are used like described above for Windows.

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Terms and Definitions

BlueCore®	Group term for CSR's range of Bluetooth wireless technology chips
Bluetooth®	Set of technologies providing audio and data transfer over short-range radio connections
CSR	Cambridge Silicon Radio
UniFi™	Group term for CSR's range of chips designed to meet IEEE 802.11 standards

Document History

Revision	Date	History
1	26 SEP 11	Ready for release 18.2.0

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CSR Synergy Bluetooth 18.2.0 BIPC Demo Description