



I2F MEDIA PRODUCTS

Technical Leaflet

Last update: August 10



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1 Before you start using I2F Media Products

1.1 General information and preparations

- I2F Media Products have been programmed in **Visual C++.net**.
- The software is protected by and operates through a **USB key with security software**. Swapping hardware (or hard disk) is not a problem as long as the key is retained.
- The licence can be installed by downloading the programme (e.g. through the Internet) in combination with the use of the USB key.
If desired, a CD can be obtained for the **installation procedure** and as a back-up.
An install wizard guides you through the installation process.
- It is strongly advisable to **remove all unnecessary programmes** as they may interfere with the uninterrupted operation of the content display.
- Use standard hardware with a 32bits Microsoft Operating System. We use the term **MCS (Media Control Server)** for hardware that is proven to be fit for the use of I2F Media Products. Minimal requirements are summed up below. Inter2Face produces the "I2F MediaBox" as a versatile MCS.
- The main factor to establish a reliable MCS lies in a **careful configuration** of the hardware.

In case you configure the hardware yourself, no doubt you are familiar with ways to optimize your computer. Below we mention minimal requirements and a few suggestions.

- 1) Start from a clean install - reformat hard disk in 2 partitions using NTFS or use a second hard disk; place the "pagesys file" on the second hard disk.
- 2) Remove antivirus and equivalent programs - they are unnecessary for your MCS (see also chapter 4).
- 3) Consider the use of both an internal memory and a hard disk defragmenter, e.g. "PageDefrag, see <http://www.sysinternals.com> and look under "file and disk utilities".
- 4) Provide preferably 512 MB internal memory if you intend to work with large files.
- 5) Provide at least 64 MB dedicated video memory if you want to use high quality images.
- 6) Consider using Tune-up utilities (<http://www.tune-up.com>) for the following purposes:
 - remove unnecessary programmes from Start-up
 - defrag internal memory (memory optimizer)
 - optimize registry
 - optimize performance
- 7) Preferably choose a BIOS version which has "Wake on LAN" for automatic scheduled power on/off features.
- 8) Remove all video & audio codecs that might claim the preferred playback of your content. Install preferably one overall codec package and test your content in a software media player to be certain that you can properly playback the content.

All elements of the above procedure can be carried out by Inter2Face upon your request. Check also chapter 1.2 with regard to codecs and chapter 3 with regard to the selection of hardware.

1.2 General requirements for content

- Check if the content that you want to reproduce is **safe**.
E.g. a script, incorporated in a URL page, is active and can be a risk.
- Check if content files can disturb the aim of your programme.
E.g. some web pages force full screen.
- Try to match the **resolution** of hardware and content.
Communicate the native resolution of the hardware used for display, e.g. monitors, to the content maker. If there is no conformity, use a postproduction programme to make the necessary adaptations, e.g. re-render the video stream to the native resolution of the monitors.
- Respect **copyright and other legal stipulations**.

Inter2Face can not be held responsible for disappointing results nor for any harm caused by the use of specific content in an I2F Media Products application.

1.2.1 Video codecs

- Test video clips in a media player programme before importing them as media resources
- Install the necessary codecs (programmes for compressing and decompressing files) on your MCS beforehand.

Inter2Face did comprehensive tests with VC-1 and H264. Other codecs may work as well, but we advise you to test them before importing your content in our software.

If you make use of one of our *template shows*, available on request, you can find out which codec has been used in the explanatory section under "Setup your program".

Template shows are offered in the form of ZIP files. Extract the i2d file and install it on your hard disk in the root C:/

Wikipedia might clarify the subject of codecs if you are not familiar with it:

<http://en.wikipedia.org/wiki/VC-1>
http://en.wikipedia.org/wiki/H.264/MPEG-4_AVC
<http://en.wikipedia.org/wiki/Ffdshow>

1.2.2 Acceptable formats

- For still images, video, camera images and sound, proven formats or standards are amongst others: JPG, GIF, MPEG2, MPEG4, MP3, MOV, WMA, WMV, AVI, V1, H264, ...

This is a non-exhaustive list.

- Furthermore all types of files that can be introduced through URL (Uniform Resource Locator), such as RSS-feeds, PowerPoint or text converted into HTML or XML, Web-Flash etc.

Find more detailed information about media resources in chapter 2.1.4.

2 Specifications for I2F Media Products

The software invites the user to make **associations**. We have done most of the programming already.

The information in this document is limited to a quick review with technical specifications and a brief background explanation.

For an in depth explanation of the software, we refer to the *manual*, available through the help button in I2F MediaBrick and I2F MediaDisplay. The "*I2F Media Products Handbook*" offers an insight in the structure of the software. Several itineraries guide you to realize specific applications. All documentation is being updated according to the ongoing development of our products.

2.1 I2F MediaBrick HD Mediaserver and controller



2.1.1 First objective: switching between media resources

- Passing from one media resource to another, *sequentially* and accurately to a frame.
- Microsoft components such as DirectX, DirectShow and ActiveX are being used. Smoothness in transitions is in correlation with the capacities of the hardware and the quality of the video chip.

2.1.2 High resolution

1920 x 1080 lines are considered to be HD. The software is capable of reproducing a higher resolution. Whether you can display your content in reality in HD depends on several factors:

- The quality of the source material
- The hardware used (computer, monitor, projector, ...)

Technical specifications need to be checked and additional codecs may have to be installed on the MCS in order to obtain an optimal result.

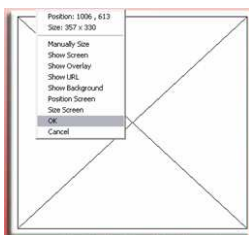
2.1.3 Three layers: backgrounds – active content - overlays



- 1) **Background:** still image (types of bitmap), full screen by default. The resolution preferably matches with the native resolution of the monitor or projector.
- 2) **Active content:** media resources can be displayed in screen cut-outs (screens) and allow switching between them, simultaneously and consecutively.

You can make **compositions** with diverse media resources, such as:

- ✓ Bitmaps
- ✓ video clips
- ✓ URL content (e.g. images from web camera's)
- ✓ Images from video capture through WDM (see also chapter 2.1.4)



The dimensions of both images and screens and their position can be modified in real time.

The software records the native resolution of the images in order to display them in a correct 1 to 1 pixel relation.

E.g. a PAL video file with 768 x 560 lines is better displayed in its true (small) dimensions than stretched out to the size of the screen.

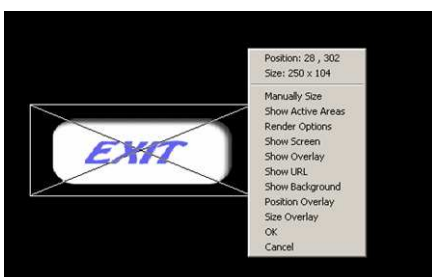


Sound files can be active content, e.g. background music, music a part of a video clip, warning sounds, beeps etc.

- 3) **Overlay:** a bitmap (still image) can serve as a means to *mask* a part of a background layer or active content.

The aim can be:

- To refine a composition graphically, e.g. showing a clip in a circular frame
- To create a transparency zone for interactive applications



The best effect for an overlay is achieved with a bitmap (BMP) although JPG and GIF can be used as well.

The active content, on which this layer is placed, has to perform in a perfectly predictable way, e.g. a bitmap or video clip. URL content cannot be used; its "behaviour", possibly with scripts incorporated, is too volatile.

2.1.4 Four categories of media resources



- 1) **Clips:** any digital imaging file in a format as described in chapter 1.2.2.
Do the test in your media player programme.
- 2) **Sound (WAV):** WAV is the necessary format for sound as an independent media resource that can be played out at the same time as a video clip.
Sound as part of a clip can be MP3.
- 3) **URL:** any content that can be retrieved through a Uniform Resource Locator, up to 8 web pages at the time (see also chapter 1.2.2).
- 4) **Video capture:** video acquisition through use of WDM Video Capture Driver for Bt848 / Bt849 / Bt878 & Bt879 Chipsets.

Note: Types of content that cannot be switched are not media resources according to I2F Media Products. The software can however activate them as “**external applications**”. Via “action command” they can gain a temporary control of the display medium.
Examples: Flash executables, Google Earth, games, basically any “.exe-file”.

When working with executables, make sure they function all right on your MCS.

2.1.5 Video editing

- Modifications can be made in the montage of video material, e.g. shorten the clip, cut redundant frames, repeat a certain sequence, reorganize chapters etc.
- Editing with the help of a timeline and in a non-linear way (not restricted to the order of the frames).

From this point it is very easy to link a certain frame in a video clip to an “Event”!



Remark: Video production & post-production as such are a separate discipline that we leave to specialists. I2F MediaBrick offers possibilities to introduce swift corrections or to adapt content to the display medium. Very handy when a deadline is near!

2.1.6 Interactive applications



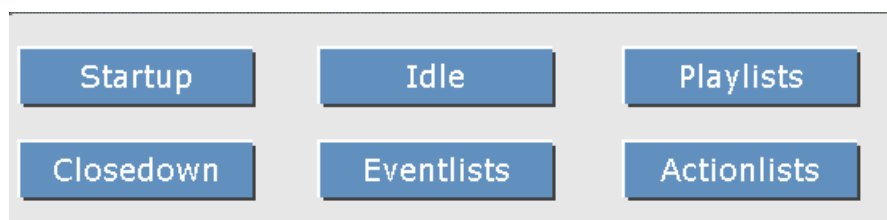
The overlay can be a “hotspot” for applications with touch screen, mouse, push buttons, sensors, motion detectors etcetera.

Every pixel on the screen, each fragment of an image can be a sensitive zone. (See also chapter 2.1.7.3)

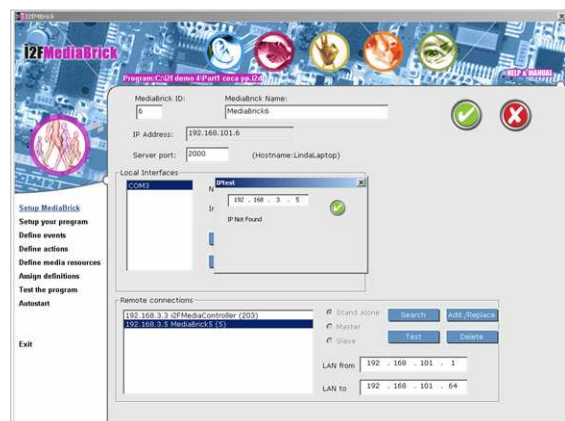
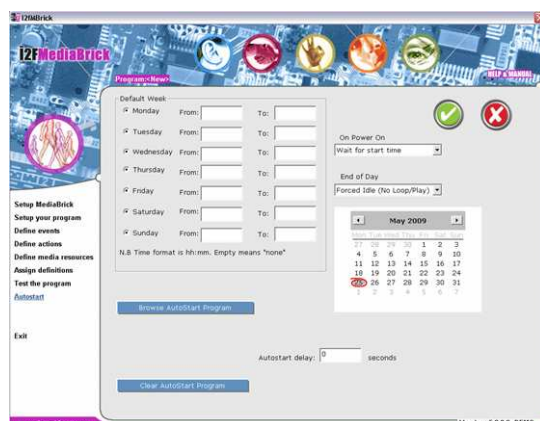
2.1.7 Events – Actions: control features of I2F MediaBrick

2.1.7.1 Control of the hardware (MCS) on which I2F MediaBrick is installed

- An I2F MediaBrick application can be in six different modes:



- Autostart:** For each day of the week and within time slots, one can define Startup, Closedown and the *modus* to which the MCS has to switch after Startup, e.g. “Go to Idle and wait for instructions” or “Go at once to Playlists”.



- In a **network**, one I2F MediaBrick, defined as “master”, can control several other I2F MediaBricks or I2F MediaDisplays (“slaves”). The master manages the status of the implicated MCS: Initiate, sleep modus (or Idle), power off. To be able to (re)start, the selected hardware should have a WOL (Wake on LAN) function. Configure this function on BIOS level as well as on OS driver level.

- Of course I2F MediaBrick can also be an **autonomous stand-alone** control unit.

When I2F MediaBrick controls a set-up locally and in a decentralized way, cable-wiring can be reduced to a minimum!

2.1.7.2 Control of peripherals

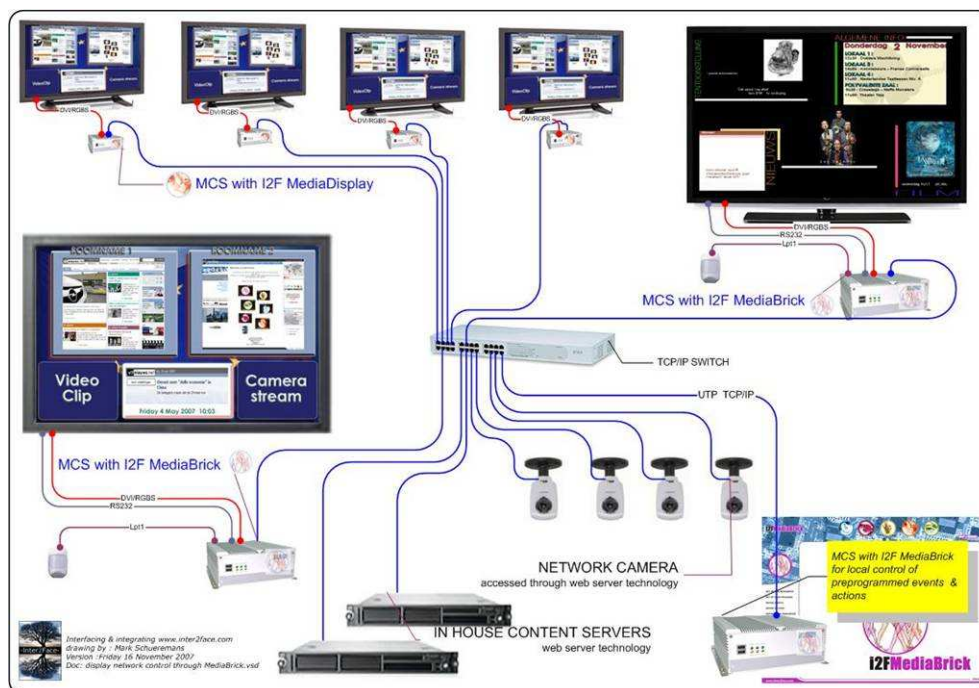
- **Standard industrial protocols** (MIDI, DMX etc.) as well as **proprietary protocols** (JVL-Mac, Kodak etc.) can be interpreted for use in I2F MediaBrick.
- Readily available reflections of protocol studies are available in the form of **I2F MediaComm's** (see chapter 2.5).
- A user friendly GUI for these I2F MediaComm's can be made available through I2F MediaBrick or **I2F MediaController** (see chapter 2.3).

Check the willingness of the manufacturer of the particular device (monitor, projector, motor etc.) to make available a protocol for external control. Contact us for a full list of protocols that we have interpreted and applied so far.

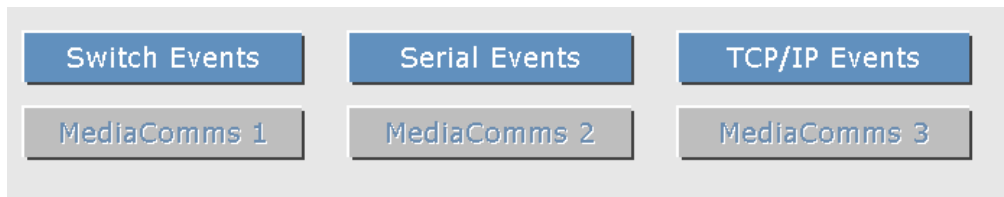
Check also the availability of physical ports on the selected hardware (MCS).

If an extension of ports is needed, this can be achieved with **I2F MediaPorts** (see chapter 2.6).

Example: control of multiple MCS by one I2F MediaBrick



2.1.7.3 Events & Actions



- Events (Inputs) and Actions (outputs) can be defined as:
 - ✓ Switch
 - ✓ Serial
 - ✓ TCP/IP

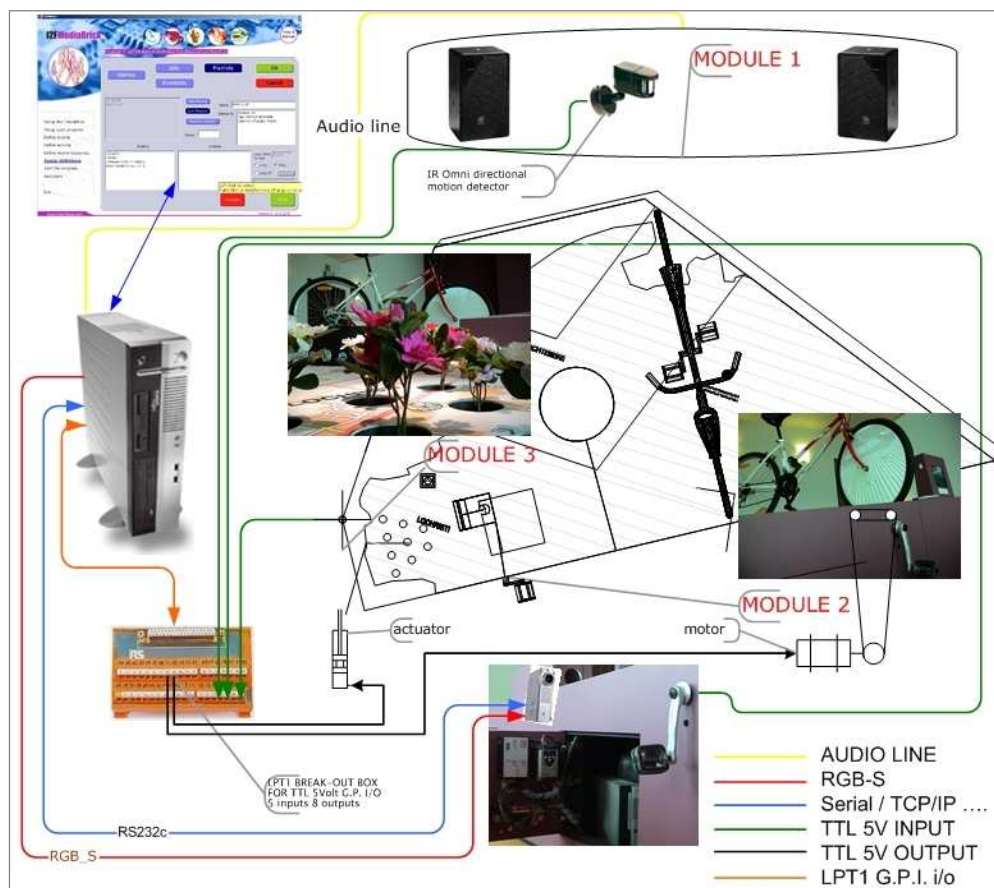
Examples of Events: a sensor, a push button, a door opening...

Examples of Actions: to make a motor rotate, to start up or wake up an MCS, a monitor or projector, to play a video clip...

- By using an "Action" of one MediaBrick as an "Event" for the next, one can have a nearly unlimited amount of tasks carried out in cascade by a large number of "Bricks".

The drawing below illustrates a real set-up in a visitor centre, which is operating fully automatically since the spring of 2005.

One MCS with I2F MediaBrick executes multiple tasks. A motion detector initiates background music and wakes up the projector. A second motion detector makes the flowers go up and down in the décor. The turning of a pedal initiates a built in sensor. This event activates a motor, which makes the bicycle wheel turn. At the same time the video clip is projected on the wheel. A part of the clip is masked in order to fit the images into the circle.



2.2 I2F MediaDisplay



2.2.1 Reproduction - passive

- A “light” version of I2F MediaBrick: control and interactive features have been turned off.
- High quality reproduction is the same as in I2F MediaBrick.
- Can be a **standalone autonomous mediaserver** operating on standard hardware.



- *Autostart* functions: Startup, closedown or go to sleep modus by means of a time schedule with days of the week and hours/minutes; the same as in I2F MediaBrick. Via video signal On/Off, the programme can also bring peripherals (e.g. monitors) in and out of sleep modus.

2.2.2 Control by I2F MediaBrick or I2F MediaController

Interactive applications and control of peripherals in a set-up are possible through the use of one I2F MediaBrick licence or one I2F MediaController (see chapter 2.3). I2F MediaDisplay obeys instructions of this software with control functions via TCP/IP.

I2F MediaDisplay recognizes only TCP/IP events.



2.2.3 Upload or modify content

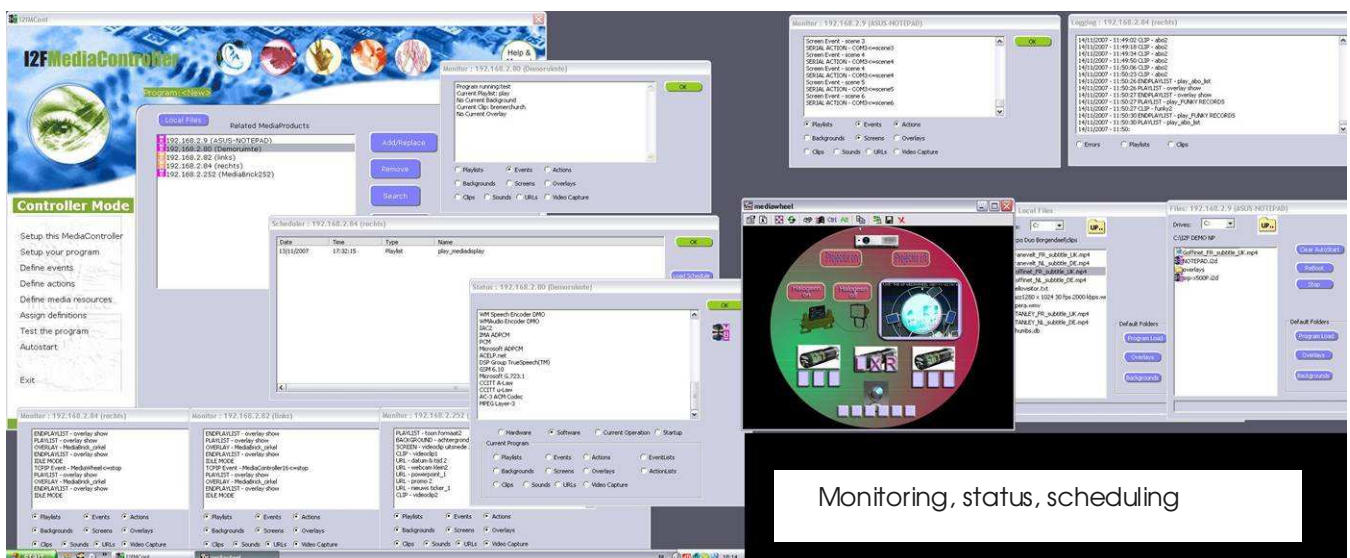
- When I2F MediaDisplays are connected to a **network**, content can be uploaded or modified naturally from one workstation.
- With an **Internet connection**, content updates can be done simultaneously for an unlimited number of mediaservers and can be pulled automatically with a chosen interval. More about this subject in chapter 5.

2.3 I2F MediaController



2.3.1 Central control

- I2F MediaBrick can act as a local “controller” in a *decentralized* set-up. This way cable-wiring (potentially weak element in your installation) is restricted to a minimum and modules or islands are totally autonomous in relation to each other.
- A *central management* can nevertheless be a bonus, e.g. to facilitate programming for a complex installation or to facilitate an easy to manage central control for the client. I2F MediaController complies with these demands.
- I2F MediaController is installed on standard hardware (MCS) and possesses the characteristics of I2F MediaBrick and MediaDisplay as a basis.
- Besides, I2F MediaController has the following qualities:
 - ✓ **Monitoring:** supervising the functioning of all hard- and software that is part of a set-up in the network. Recording of MCS that are active, their technical specifications, files they have access to and the modus they are in.
 - ✓ **Status reports:** producing log files with the requested information (see above); if necessary the administrator is notified of abnormalities by sms or by email.
 - ✓ **Top of the hierarchy:** pre-programmed instructions of I2F MediaBrick and I2F MediaDisplay can be replaced with immediate effect by new instructions for all modules or individually.
 - ✓ **Scheduling:** to plan modifications in programming at a specific moment in the future. This feature will be fully available in the near future.
 - ✓ **File transfer and remote execution:** central control of individual “Bricks” and “Displays” with remote instructions.



2.3.2 Execution

In order to list all devices involved in the network and to determine concrete objectives, the programming of I2F MediaController is best preceded by a *system analysis*.

Visualizing the central management by an orderly **graphical user interface** can become a specific mission in order to make the execution of some tasks accessible to non-specialists.



2.4 I2F MediaPlus



- A set of software additions which are not necessary for the normal use of I2F MediaBrick or I2F MediaDisplay.
- **I2F Sound** is an option for playback of sound WAV files that are not integrated in a video clip, e.g. background music, warning sounds, beeps, etc.

2.5 I2F MediaComm's



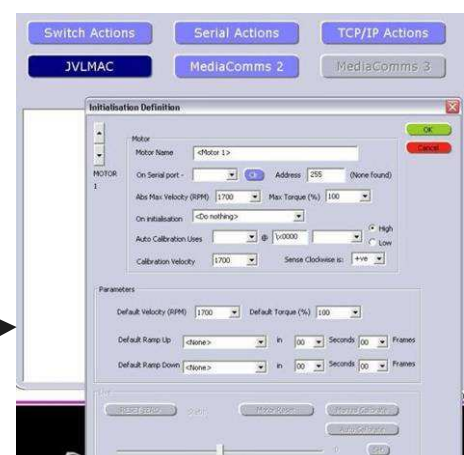
- Software plug-ins with readily available **industrial or proprietary protocol interpretations**.
- They can form the bridge between I2F MediaBrick and I2F MediaPorts, e.g. to control lights.

As we get confronted with specific protocols, new I2F MediaComm's are gradually created. I2F MediaComm DMX512 has been integrated into I2F MediaBrick.



I2F MediaComm DMX

I2F MediaComm JVL-MAC (motor control)



2.6 I2F MediaPorts



- I2F MediaPorts are extensions of ports and protocols (MIDI, DMX, serial, parallel, analogue etc.) on hardware level. In that case they complement I2F MediaComm's.
- Any standard hardware that supports I2F Media Products can become an instrument, listed as I2F MediaPorts.

A few examples of I2F MediaPorts:

2.6.1 USB controlled DMX interface

USB



Standard device, link between I2F MediaBrick and I2F MediaComm DMX 512.

2.6.2 I2F PC/CPC Peripheral Card



This is an extension of diverse types of ports, able to control a multitude of peripherals.

Of this proprietary device from earlier activities there is still a handful available.

3 Hardware selection

3.1 Media Control Server (MCS) - I2F MediaBox

- Take into account form factor, reliability, performance, quality of the video chip etc. of the standard hardware that you select for your concrete application.
- Maintain the *load balance* between the capacity of the hardware (internal - & video memory processor speed) on the one hand and the displayed content on the other.
- Testing an application beforehand is essential!

Minimal requirements are:

- Processor minimum 1,2 GHz
- 32 bits Microsoft OS
- Available memory on video chip minimum 8MB (64MB for HD)
- Preferably minimum 512 MB internal memory

Inter2Face produces **I2F MediaBox** in order to answer the need for a versatile hardware solution with the best available components on the market, adaptable to specific needs.

I2F MediaBox comes in 2 form factors:

microATX (335 mm x 255 mm x 91 mm) and **miniITX** (275 mm x 179 mm x 65 mm).

Technical data for the standard batch 01/2010:

Motherboard microATX:	Intel Desktop Board DP55WB Media Series
Motherboard miniITX:	Intel Desktop Board DH57JG
Intel Media Processor:	Boxed Intel® Core i3-530 Desktop Processor
HD:	Intel X25-V Value SATA Solid-State Drive
Internal memory:	Kingston Valueram memory 4GB 1333MHz DDR3 Non-ECC CL9 DIMM
Power supply microATX:	HEC-300FE-2RX 300 Watt high efficiency power supply
Power supply miniITX:	Seasonic SS-250SU APFC F0
5 Volt & 12 Volt available for external peripherals through Phoenix connector	
Options: diverse I/O break-outs such as DMX, serial connections...	

An optional extension piece secures cable ends and connectors. I2F MediaBox is easy to fix to a wall or table.



Other hardware suggestions

multiple ports controller

AEC-6920

Rugged fanless embedded hardware, Intel Core 2 Duo, Core Duo Processor, 2 PCI slots, 1 PCI Express Expansion, GbE Ethernet, 4 Com, 4 USB, Anti-vibration, Anti-shock



Digital display

Fujitsu Siemens Esprimo Q series



Quadsplit multiscreeen

19" rack mount model

Asus P5PL2 Antec 19" rackmount 3U Black Server
 ---- GA-965G-DS3/ATX S775 1066Mhz DDR2--
 Intel Dual Core --- Nvidia 7200 or Matrox QID
 LP PCIe four xga outlet



Remote control / Handheld interaction

Handheld form

R2H-BH077T/Celeron M 900MHz 512MB
 DDR1 533 60GB VGA Intel 910GML 7" TFT
 XP Tablet Azerty



3.2 Other standard hardware in the configuration

- I2F MediaBrick can control diverse peripherals via **switch, serial or TCP/IP connections**. A standard industrial or proprietary *protocol* needs to be acquired. (See also chapters 2.1.7 and 2.5).
- By putting in **I2F MediaComm's** and/or **I2F MediaPorts**, other forms of communication are possible as well, such as DMX, MIDI.

The list of controllable devices is almost unlimited.

Examples are: LCD or plasma monitors, video projectors, (web) cameras, sound installations, interactive kiosks, light etc.

- It is feasible to use I2F Media Products in order to make control-instruments such as **complex appliances** for conference rooms accessible to the user who lacks technical skills.

4 Security – updates - upgrades

4.1 Security statement

- I2F Media Products software is a closed circuit, meaning there are no other interrelations than those that are established by the client.
- The source code does not contain any links with the creators of the software. There is no hidden agenda!
- This implies e.g. that the software does not inform you about available updates or upgrades. You will be informed by Inter2Face through the normal communication channels.
- This closed circuit enables the administrator to watch closely which programmes are installed on the MCS and which content is accepted. This justifies our position that you do not need an anti-virus or related programme on your MCS (see chapter 1.1).

4.2 Content transport & updates

- A specific local **TCP/IP network** is established or your existing TCP/IP network is used for transporting content.
- Updates of content such as video or text can have effect according to a **pre-programmed refresh rate**. Otherwise it can be at the next display of the relevant **playlist**. Thirdly, updates can have effect at the reload of the .I2d definition file.
- Web content is updated automatically according to a defined refresh rate (e.g. RSS feed)
- Content can be updated by **any authorized person** who has access to the network from his/her workstation. Conditions: maintain the predefined format and file name.



- Modifications of formats (e.g. creating new “screen cut-outs”) and replacing video clips are best done by a **person with graphical skills**. The dimensions and resolution of the files should be taken into account, in order to fit them into the screen cut-outs.

4.3 Software updates and upgrades




- Software licences can be obtained for an **indefinite time** or for a **limited time**. There are also rental prices (for a few months maximum).
The use of the software can be limited by the USB key.
- **Software updates (*) and minor upgrades (**)** are free during one year from the date of purchase in the case of a non-expiring licence, during 6 months in the case of a licence valid for 3 years. Both updates and minor upgrades come in the form of *patches*.
- **Major upgrades (***)** remain available for purchase during one year from the release date. After that time, the client can purchase a new licence if desired.
Major upgrades entail a change of version number (e.g. from 3.0.7.0 to 4.0.0.0).
- Updates and upgrades are not obtained through an automatic process. Inter2Face informs its clients of their release and contents. The implementation of patches or new versions is carried out **by an authorized person, manually per licence**.
- A software licence purchased for an indefinite time remains valid for the same application without any limitation. The purchase of updates or upgrades is in that case not absolutely necessary but can be useful to obtain new features or a new GUI.
- **An upgrade from an I2F MediaDisplay licence to an I2F MediaBrick licence** can at all times be obtained.




(*) Software updates can include bug fixing, improvement of graphics and improving the usability or performance.

(**) Minor upgrades improve the functionality of the software or contain minor new features.

(***) Major upgrades contain important new features or an important improvement in functionality.

5 I2F Media Products correlation chart

 I2F MediaBrick	 I2F MediaDisplay	 I2F MediaController
6 uses media resources in 3 different layers: background – active content - overlay	<ul style="list-style-type: none"> uses media resources in 3 different layers: background – active content - overlay 	<ul style="list-style-type: none"> Uses media resources in 3 layers: background – active content - overlay
7 4 categories of media resources: clips – sounds – URL – video capture	<ul style="list-style-type: none"> 4 categories of media resources: clips – sounds – URL – video capture 	<ul style="list-style-type: none"> 4 categories of media resources: clips – sounds – URL – video capture
<ul style="list-style-type: none"> allows external applications 	<ul style="list-style-type: none"> allows external applications 	<ul style="list-style-type: none"> external applications OK
<ul style="list-style-type: none"> responds to EVENTS (inputs) 		<ul style="list-style-type: none"> responds to EVENTS (inputs)
<ul style="list-style-type: none"> performs ACTIONS (outputs) 		<ul style="list-style-type: none"> performs ACTIONS (outputs)
		<ul style="list-style-type: none"> can plan “control actions” (scheduling)
<ul style="list-style-type: none"> uses standard in-/outputs of the MCS and serial, TCP/IP & USB connexions 	<ul style="list-style-type: none"> interacts through TCP/IP when supported by I2F MediaBrick or I2F MediaController 	<ul style="list-style-type: none"> uses standard in-/outputs of the MCS and serial, TCP/IP & USB connexions
<ul style="list-style-type: none"> communicates with standard industrial and proprietary protocols 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> communicates with standard industrial and proprietary protocols
<ul style="list-style-type: none"> is fully autonomous 	<ul style="list-style-type: none"> can be a standalone mediaserver; can start/stop automatically 	
<ul style="list-style-type: none"> can control other I2F MediaBricks or be controlled by I2F MediaBrick or MediaController (master or slave) 	<ul style="list-style-type: none"> can be controlled by I2F MediaBrick or MediaController (slave) 	<ul style="list-style-type: none"> controls centrally and remotely an unlimited number of I2F MediaBricks and I2F MediaDisplays (remote execution)
		<ul style="list-style-type: none"> monitoring and status reports

 I2F MediaComm's	 I2F MediaPorts	 I2F MediaPlus
<ul style="list-style-type: none"> software plug-in for communication with external devices (e.g. projector, JVL-Mac, etc.) 	<ul style="list-style-type: none"> hardware accessories (e.g. USB controlled DMX interface, I2F PC CPC peripheral card etc.) 	<ul style="list-style-type: none"> software added values (e.g. I2F Sound)
<ul style="list-style-type: none"> acts within I2F MediaBrick and I2F MediaController as an EVENT and/or ACTION (e.g. DMX, MIDI) 	<ul style="list-style-type: none"> possibly a hardware counterpart of I2F MediaComm's 	