1. TECHNICAL SPECIFICATIONS

1.1. IPTV OVERVIEW

IPTV stands for Internet Protocol Tele-Vision. It is a way of streaming videos and/or audio only using computer network connections. It is common in hotels and cruise ships. It is becoming the standard TV connection for every new facility in some areas (e.g. Scandinavia).

1.2. IPTV SYSTEM ADVANTAGES

- **High quality signal** guaranteed for ALL equipment. The signal arrives to cardio fitness machines (VISIO), through network cables of Cat5e/6, and so avoids the typical problems found with analogue coaxial cable (disturbances, interferences, “snow effect”).
- **Reduced cost** of maintenance.
- **Layout** changes and upgrade easier because computer networks are more flexible.
- **Manage all TV standard** in one solution
  - Satellite, Cable, Terrestrial, Analog FTA and encrypted.
  - Converts all signals in one standard stream (IPTV).
  - Creates and distributes his own contents via PC or DVD.
- **Advanced contents and services**
  - Personalized channels
  - Subtitles, multi-lingual options
  - Radio channels via IP

1.3. IPTV AND VISIO

VISIO is a digital platform with built-in computer connection (LAN). VISIO can handle IPTV streaming directly from the computer network cable. This leads to lower installation and maintenance costs and an improved quality of image. See in the picture below an IPTV & Visio generic architecture.
1.4. IPTV MAIN COMPONENTS

There are 4 main building blocks composing an IPTV system: content source, IPTV central gateway, computer network, VISIO units and other content displays (e.g. TV with Set Top Boxes).

1. Content source

- TV (PAL/NTSC, DVB/ATSC, SAT, Cable), PC, DVD.
- Free To Air (FTA) and/or encrypted signals.
2. **IPTV Gateway** (optional smart-card for encrypted contents)

3. **IGMP Ethernet Switch** (LAN distribution computer network)

4. **VISIO**

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1.5. **IPTV DETAILED INFRASTRUCTURE**

Refer to **VISIO & VISIOWEB Service & Maintenance manual** for more information (par. 4.9 – IPTV)
1.6. VISIO & IPTV MINIMUM REQUIREMENTS

- **IGMP Snooping Enabled** 100/1000 Megabit Ethernet Switch
- Number of Switch ports at least equal number of installed Visio machines.
- RJ45 Cat5e (100MB)/ Cat6 (1000MB) Hardwired Ethernet network
  - IPTV is not working by Wi-Fi network.
- IPTV Video Streaming Gateway
- Input TV/Video format compatible with above IPTV Video Streaming Gateway

1.7. SUPPORTED IPTV VIDEO FORMATS

- MPEG-2
- MPEG-4 TS SD (Standard Definition). Also called MPEG-4 part 1 or ISO/IEC 14496-1
- UDP, RTP, Multicast & Unicast protocols
- H264 SD* format (also called MPEG-4 AVC or MPEG-4 part 10 or ISO/IEC 14496-10), standard definition (3x3 digit video resolution).

*H264 SD format is compatible starting with Visio’s produced in 2012 year.

Additional requirements:
- Max input bitrate = 50000 kb/s (5Mbps)
- Audio type = mpga
- Video type = mpgv, mp4v or H264 (if Visio produced in 2012 year).

1.8. NOT SUPPORTED IPTV VIDEO FORMATS

- HD (High Definition) channels
- H264 HD format (also called MPEG-4 AVC or MPEG-4 part 10 or ISO/IEC 14496-10), high definition (4x4 digit video resolution).
- VoD (Video On Demand) via RTSP
- Encrypted channels.
**Video Resolution** of Standard Definition (SD) signal is **3 digits x 3 digits** (ie. 800 x 600), and not **4 digits x 4 digits**, proper to an **High Definition (HD)** signal (ie. 1920 x 1080).

**Examples:**
1.9. BRAND OF VISIO COMPATIBLE VIDEO HEAD END/ IP GATEWAY TESTED

The view of IPTV server is extremely complex and varied, so it is impossible to ensure in advance the compatibility of Visio Web with all the types available. The IPTV WEB VISIO has been validated on a well-defined list of IPTV servers. It is therefore essential to follow these steps:

1) If the customer does not have an IPTV system, you have to require the installation of an IPTV server that has already been proven compatibility with Visio Web.

2) If the customer already has an IPTV server, you must perform all the technical verifications prior to "sell" the compatibility of Visio Web. If compatibility is not insurable, please require the customer to replace the IPTV server with one of the list below.

Technogym recommend one of the following company:

- Anevia (www.anevia.com)
- Streamtel (www.streamtel.com)
- Deuromedia (www.deuromedia.com)
- VDA (www.vdavda.com)
- Lufthansa System (www.lhsystems.com)
- Teracue (www.teracue.com)
- TryplePlay (www.tripleplay-services.com)
- One LAN Omni-Server Encode (www.onelan.com)
- Exterity (www.exterity.com)
- Bizstream (www.bizstream.com.uk)
- Eurosatelites (www.eurosatellites.com)
1.10. HOW TO RUN IPTV SYSTEM ON VISIO

- **Before the installation**
  1. Check if IPTV at customer **satisfy our minimum requirements** (see par. 1.6).
  2. Check if IPTV at customer **comply to our IPTV Video formats** (see par. 1.7)
  3. Customer must provide all **Visio network IP address** (one IP address for each Visio).
  4. Customer must provide the **IPTV channels list** (one IP address for each channel).


- **During the installation**
  1. Check the **Visio network plant**: all Visio machines must be connected to the network by Ethernet **LAN cable**.
  2. Configure each Visio by the **network IP address** provided (subnet mask and Default Gateway as well). Manually on each machine or automatically if **DHCP** server is available.

  See procedure on VISIO & VISIOWEB Service & Maintenance manual (par. 4.5.2 – VISIOWEB Network configuration menu)

  3. Configure on one Visio screen the **IPTV channels list**. Copy on **USB stick** and transfer to all the other.

  See procedure on VISIO & VISIOWEB Service & Maintenance manual (par. 6.4 – IPTV Configuration)

  4. Double check the **MPEG decoding type** in User’s menu > More configuration. It must be selected **software decoding**.

  5. **Test the IPTV** images quality and sound, by changing through all the channels.
2. TROUBLESHOOTING

2.1. THERE ARE NO IPTV CHANNEL PICTURES OR AUDIO ON ALL THE VISIO MACHINES

This procedure allow you to understand if the problem is on the IPTV streams, or computer network distribution, or on the VISIO/VISIOWEB device.

If the problem happens on only one, or a few machines, please go to paragraph 2.2.

To carry out the following procedure you must have a USB stick updated for VISIO/ VISIOWEB SW upgrade, and a laptop with VLC Media Player (the latest SW ver. can be downloaded at http://www.videolan.org/)

Follow the next troubleshooting procedure, point by point, until problem is solved or the cause determined.

1. Check that the device SW version is the 4.3.3 or higher. If not, first upgrade the software and test again the equipments, re-configuring the IPTV channels.
2. Disconnect the **LAN network cable** from the machine and **connect** it to the **LAN of your laptop**.

3. Configure the **Local Area Network Connection** on your laptop: select a static IP address, provided by customer, or enabled DHCP, if present.

   ![Image](image1.png)

   If you try by using the IP address of the Visio just disconnected, the main switch may not recognize the MAC address, giving an **IP address conflict** message.

4. Start **VLC Media Player**, select **Media**, then **Open Network Stream**.

   ![Image](image2.png)

   Insert one **IPTV channel address**, provided by the customer or memorized on VISIO, on VLC, following the next format: “**kind of protocol**://@”**channel IP address**:”**port**”.

5. Press **Play** button and check if **channel is displayed**:
6. In case of **bad quality** or **no pictures**, even on VLC, the problem is on the **club network** or on the **IPTV distribution system**. Contact the club **network administrator** in order to check:
   a. IPTV gateway;
   b. main IGMP Ethernet Switch;
   c. LAN network wiring.

7. In case of **VLC correctly displays the IPTV channels**, check the **signal information**, as detailed below, checking they meet the IPTV signal requirements: while **VLC is running** the desired channels, select **Tools**, then **Codec Information**.
8. In the tab “Codec Details”, check the **Audio** and **Video streams** comply our requirement, as per paragraph 1.7: “**SUPPORTED IPTV VIDEO FORMATS**”.

![Codec Details Tab](image)

<table>
<thead>
<tr>
<th>Stream 0</th>
<th>Stream 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type:</strong> Video</td>
<td><strong>Type:</strong> Audio</td>
</tr>
<tr>
<td><strong>Original ID:</strong> 4026</td>
<td><strong>Original ID:</strong> 4027</td>
</tr>
<tr>
<td><strong>Codec:</strong> MPEG-1/2 Video (mpgv)</td>
<td><strong>Codec:</strong> MPEG Audio layer 1/2/3 (mpga)</td>
</tr>
<tr>
<td><strong>Resolution:</strong> 720x448</td>
<td><strong>Channels:</strong> Stereo</td>
</tr>
<tr>
<td><strong>Frame rate:</strong> 50</td>
<td><strong>Sample rate:</strong> 48000 Hz</td>
</tr>
</tbody>
</table>

**Check input bitrate on this menu (< 5Mbps)**

**Compatible Video format:** mpegv (res.3x3 digits)

**Compatible Audio format:** mpga (bitrate 224kb/s)

| Location: | udp://@224.10.10.10:1234 |

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9. **Register** a part of the “not compatible” stream, to send it to TG for further investigation, by following the next procedure:

   a. Be sure **Advanced Controls** is enabled on **View** menu
   b. Play the channels and press the **record button** (red circled in the pic below)
   c. To **stop recording** press again the same button.
   d. Find the **recorded piece of stream** into path:
      
      C:\Documents and Settings\"current user"\My Documents\My Videos
e. **Send this file** to TG HQ, or load it into TG ftp site, on agreement with the **International After Sales** service.

### 2.2. THERE ARE NO IPTV CHANNEL PICTURES OR AUDIO ON ONE OR A FEW MACHINES

The problem could be on the **computer network** distribution, or on the **VISIO/VISIOWEB** device. Follow the next troubleshooting procedure, point by point, until problem is solved or the cause determined.

1. **Swap the LAN cable** between a working VISIO machine and a not working one. If the problem moves please contact the club **network administrator** in order to check:
   a. **LAN network wiring**, related to faulty machine/machines: network cable cut/damaged) or an hub, or no IGMP switch, has been added to the network line.
   b. Main **IGMP Ethernet Switch** (ports switched OFF or not properly configured).
2. Connect the LAN cable (coming from the wall) directly to the Visio LAN port, by-passing the one inside the machine. If works, check/replace the network cable inside the machine.

3. Check:
   a. Visio software: perform an Upload Synch from the service menu;
   b. IPTV channels configuration: copy it from another working Visio by USB key.

4. Do FULL SYSTEM RESTORE as last resort.

5. Replace the complete Visio.

### 2.3. “BAD QUALITY” IPTV CHANNEL PICTURES OR AUDIO ON ALL THE VISIO MACHINES

For both audio and video issues the problem could depend on the IPTV streams, or the computer network distribution, or on the VISIO/VISIOWEB device.

DTV images have some picture defects that are not present on analog television, because of present-day limitations of bandwidth and compression algorithms such as MPEG-2. These defects appear in sequence as a shimmering blur of dots around edges, called mosquito noise, as they resemble mosquitoes swarming around the object.

![“Good quality” image](image1)

![Mosquito noise](image2)

Lossy audio formats typically involve the use of a time/frequency domain transform. When the psychoacoustic model is inaccurate, when the transform block size is restrained, or when aggressive
compression is used, this may result in **compression artifacts**. Compression artifacts in compressed audio typically show up as ringing, pre-echo, "birdie artifacts", drop-outs, rattling, warbling, metallic ringing, an underwater feeling, hissing, or "graininess".

If the problem happens only on **one, or a few machines**, please follow the same troubleshooting as per **paragraph 2.2**.

Follow the next troubleshooting procedure, point by point, until problem is solved or the cause determined.

1. Check that the device **SW version** is the **5.22.6 or higher**. If not, first upgrade the software and test again the equipments, re-configuring the IPTV channels.
2. Follow the same procedure of **paragraph 2.1, until point 5.**
3. In case of "**bad quality**” picture/audio even on VLC, the problem is on the **club network** or on the **IPTV distribution system**. Contact the club **network administrator** in order to check:
   a. **IPTV gateway**: content sources may not be received and distributed properly;
   b. **main IGMP Ethernet Switch**: IGMP function could be not present or not enabled;
   c. **LAN network wiring**: an hub, or no IGMP switch, has been added to the network line;
4. In case of **VLC correctly displays the IPTV channels**, check the **signal information**, as described starting from **point 7 of par. 2.1**, in order to check if they meet the IPTV signal requirements. Then **send to TG International After Sales** “a part” of the stream by using **ts.decode.exe**.

### 2.4. RANDOM BLACK TV CHANNELS ON ALL MACHINES

Basically when Visio **shows all black TV screen** while other functions are working (Web, Games, Club...), that means the **Mediaplayer has shut down**. This is the software used by Visio to shows IPTV channels. This usually happens when a streamed channel is **not complying our minimum requirements** (see par. 1.7). I.e.: if a HD channel or if an high input bit rate channel (>5Mbs) has been streamed. In this case **unique solution** is to identify and remove this channel because not conformal to our minimum requirements.

Double check the **MPEG decoding type** in User’s menu > More configuration. It must be selected **software decoding**.