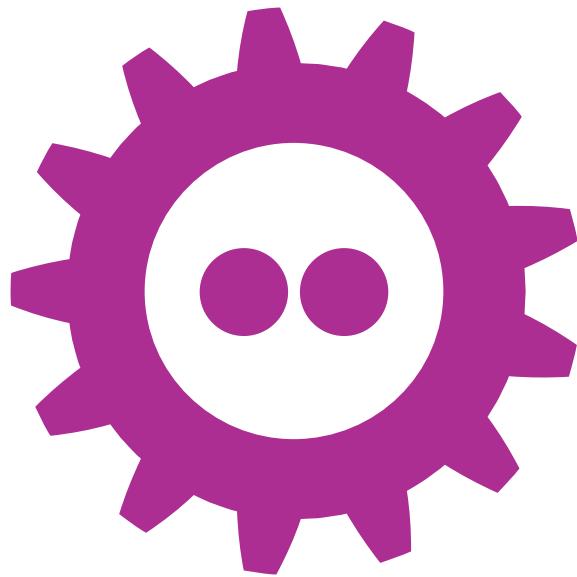


FOSDEM AV Manual  
FOSDEM Video

January 6, 2019



FOSDEM AV Manual



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## 1 People

Video is a big task, so there are many people working together to make it all happen. Here's all the teams:

### 1.1 AW, H, K, U and J teams

You should be a team of two per building: AW, H, K, UA and UD respectively. J (probably) has a dedicated knowledgeable volunteer.

Coordination with video operations control (VOC) happens through walkies and irc://irc.freenode.net#fosdem-video.

Your tasks before the conference starts:

- take the equipment to the rooms in your building
- work from the biggest to the smallest room
- do basic setup: cam, sound, plug in cables, basic audio checks with microphones, ... See below for details.
- ensure the rooms are ready before the first talk starts

During the day, you'll have a fixed spot in the building:

- AW: under the stairs
- K: at the NOC
- H: behind the info desk
- UA: in the corridor near Henriot (UA2.118)
- UD: in the corridor near Chavanne

Your job during the conference, with the backup from the VOC team, is to do the following in your building:

- monitor video. Hint: bring at least one laptop running mpv. (You will also get one laptop per team, but that one can only monitor four streams.)
- proactively fix problems with video. In some rooms, this includes preventatively replacing batteries!

### 1.2 Video operations control or VOC

You are in the NOC in the K building, with ssh access to all video machines: video boxes in the rooms, vocto machines near VOC, streaming backends and frontends, and the web pages showing the videos to our visitors.

Your job is to constantly monitor all the equipment and streams for problems, and to arrange fixes for any that occur. They have visual monitoring of all audio streams.

Do not run out to fix problems yourselves. Delegate to the AW, H, K and U teams. Maintaining contact between everyone is your main priority.



### 1.3 In the devroom

If you are volunteering for video inside a devroom, please:

- stay near the video equipment, keeping it safe (from people tripping over cables for example!)
- make sure the camera is aimed at the speaker
- monitor the devroom video/audio feeds (headphone!) for problems
- signal problems to VOC by irc

Please do *NOT* disconnect or turn off any equipment yourself. That is the task of the per building team only.

## 2 Rooms

We have 24 rooms: 12 small, 6 large and 6 extra large rooms. Each type of room has a different audio/video setup.

- AW: AW1120 (S), AW1121 (S), AW1124 (S), AW1125 (S), AW1126 (S)
- K: K1105 (XXL), K3201 (S), K3401 (S), K4201 (S), K4401 (S), K4601 (S)
- H: H1201 (L), H1302 (L), H1308 (L), H1309 (L), H2213 (S), H2214 (S), H2215 (XXL)
- UA: UA2214 (L), UA2220 (XXL), UB2252A (XXL), TODO more
- UD: UD2120 (XXL), UD2218A (L), TODO more
- J: Janson (XXL)

Your team's flight case comes with a printed map of where the video gear goes in your rooms. Audio and power cabling should be arranged loose on the floor, or taped down after coordination with the network team! When taping down XLR cables, please provide sufficient slack for getting up to the camera. It is about 2m above ground level!

### 2.1 Small rooms

These have a projector and a tie pin microphone for the speaker. They use the Canon XF100 camera. Audience questions are picked up by the camera's internal microphone.

The connections there are as follows:

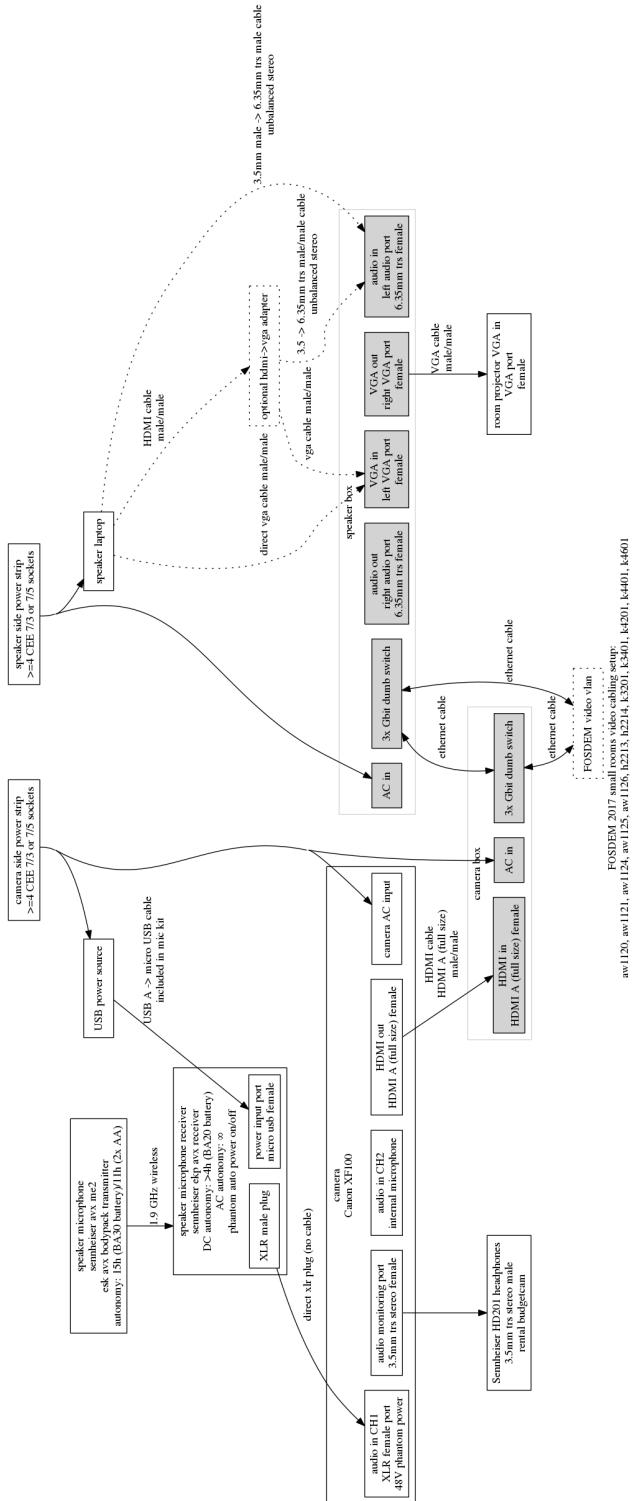
- Network cable (video VLAN) to the presenter box (any port)
- Network cable from the presenter to camera box (any port, on each side)
- Camera, presenter box, video box, USB power for the microphone receiver to the AC power
- XLR cable from the microphone receiver to channel 1 (LEFT) of the camera
- USB power to the microphone receiver
- HDMI from the camera to the HDMI port of the video box
- VGA cable from the presenter box left VGA port to the beamer in the room
- VGA cable from the speaker's laptop to the right VGA port of the presenter box



- stereo-jack cable + converter from 3.5" to 6.25" jack from the speaker's laptop to the sound port of the presenter box
- stereo-jack + converter from 3.5" to 6.25" from the presenter box to the PA system if the room (if any)



### 2.1.1 Cabling diagram





## 2.2 Large rooms

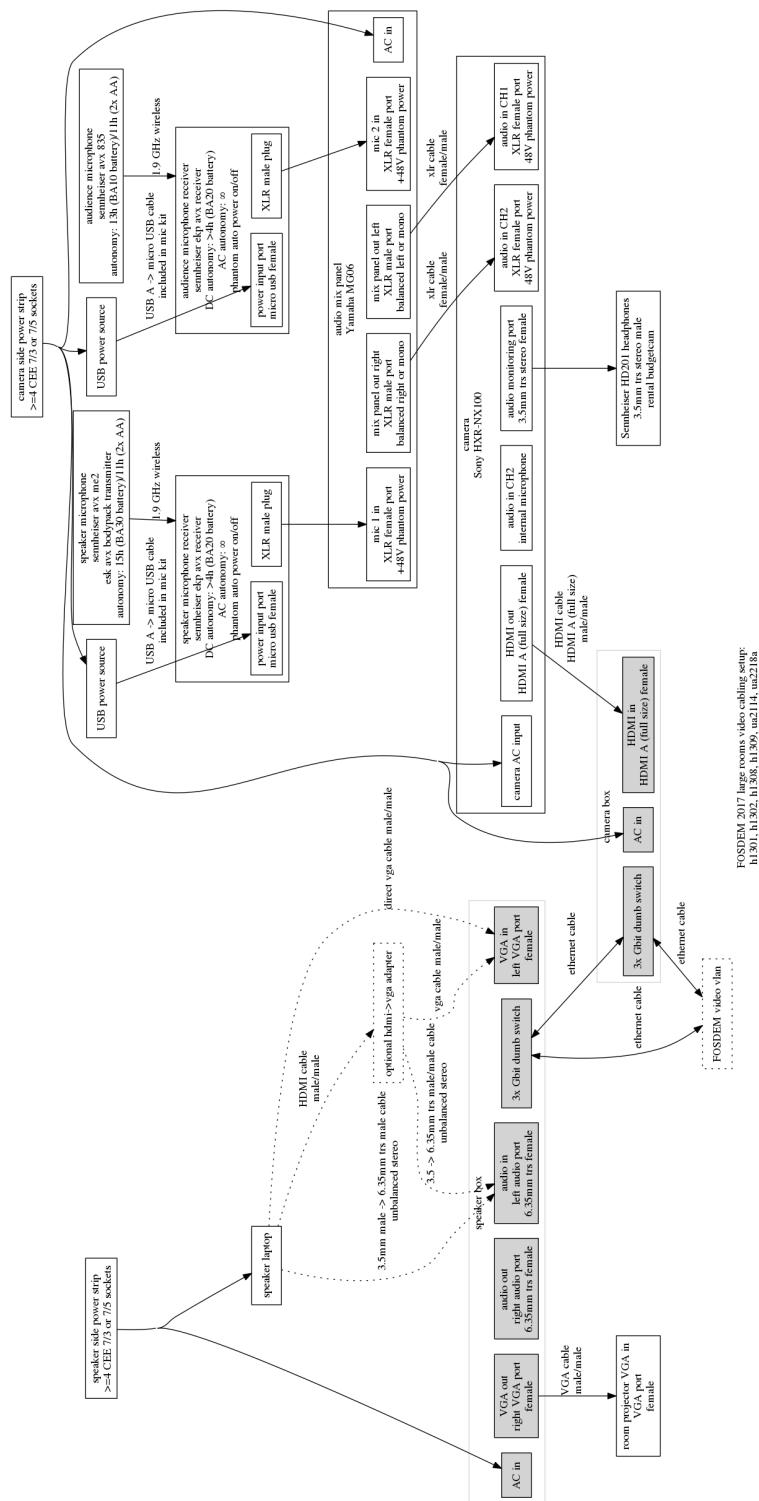
These have a projector, a tie pin mic for the speaker and an audience microphone. They use the Sony HXR-NX100 camera.

The connections there are as follows:

- Network cable (video VLAN) to the presenter box (any port)
- Network cable from the presenter to camera box (any port, on each side)
- Camera, presenter box, video box, USB power for the microphone receiver, audio mixer to the AC power
- Microphone receiver for the speaker's microphone to channel 1 of the mixer
- Microphone receiver for the audience microphone to channel 2 of the mixer
- XLR cable from the left channel of the audio mixer to channel 1 (LEFT) of the camera
- XLR cable from the right channel of the audio mixer to channel 2 (RIGHT) of the camera
- USB power to the microphone receiver
- HDMI from the camera to the HDMI port of the video box
- VGA cable from the presenter box left VGA port to the beamer in the room
- VGA cable from the speaker's laptop to the right VGA port of the presenter box
- stereo-jack cable + converter from 3.5" to 6.25" jack from the speaker's laptop to the sound port of the presenter box
- stereo-jack + converter from 3.5" to 6.25" from the presenter box to the PA system if the room (if any)



## 2.2.1 Cabling diagram





## 2.3 Extra large rooms

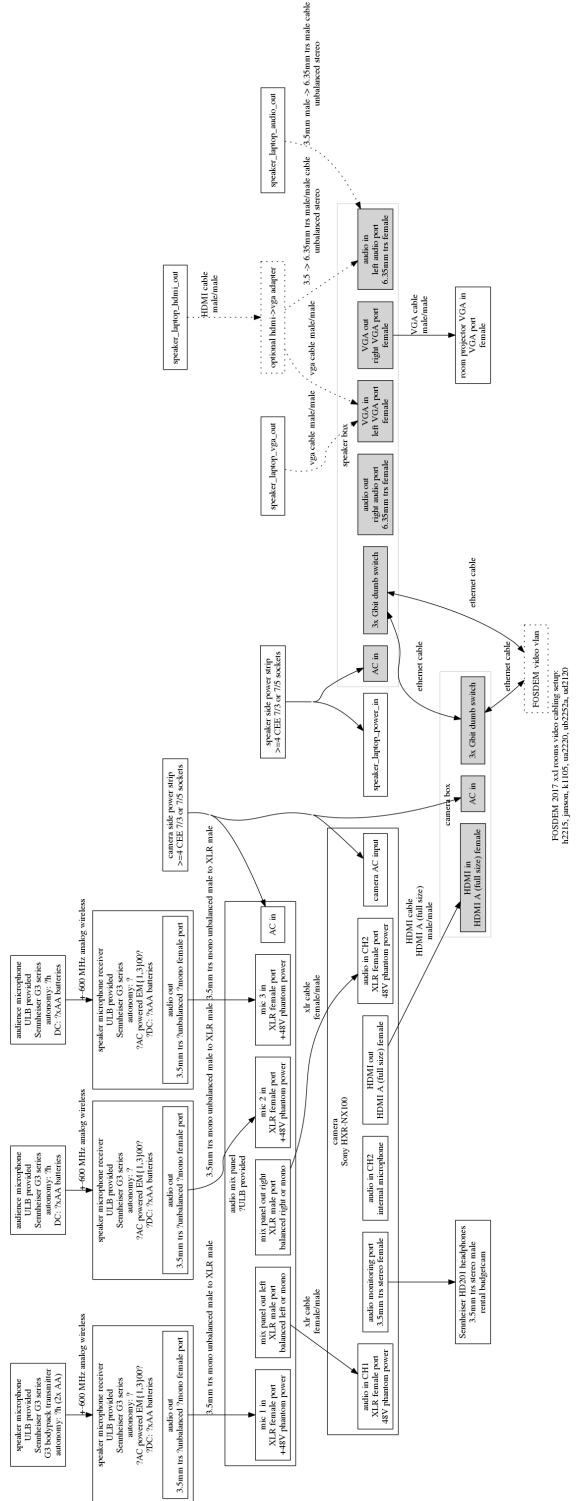
These have a projector, a tie pin mic for the speaker and one or two audience microphones. They use the Sony HXR-NX100 camera.

The connections there are as follows:

- Network cable (video VLAN) to the presenter box (any port)
- Network cable from the presenter to camera box (any port, on each side)
- Camera, presenter box, video box to the AC power
- XLR cable from the left channel of the audio mixer (ULB provided) to channel 1 (LEFT) of the camera
- XLR cable from the right channel of the audio mixer (ULB provided) to channel 2 (RIGHT) of the camera
- HDMI from the camera to the HDMI port of the video box
- VGA cable from the presenter box left VGA port to the beamer in the room
- VGA cable from the speaker's laptop to the right VGA port of the presenter box
- stereo-jack cable + converter from 3.5" to 6.25" jack from the speaker's laptop to the sound port of the presenter box
- stereo-jack + converter from 3.5" to 6.25" from the presenter box to the PA system if the room (if any)



### 2.3.1 Cabling diagram





### 3 FOSDEM video boxes

The FOSDEM video box will take care of the streaming and recording. There is no need to operate the controls on the camera (once on and in the correct video mode, which the setup team will have done). The setup team should also have connected the following:

- at least one network cable
- a power cable, connected to mains, with the box already turned on
- slides boxes only:
  - the right jack connection should be connected to the room audio system
  - The right VGA connection should be connected to the projector
  - The left jack connection should have a loose mini-jack cable, for connecting to the presenter laptop
  - The left VGA connection should have a loose VGA cable, for connecting to the presenter laptop
- Cam boxes only:
  - An HDMI cable to the (powered on) camera (the SDI connection is for backup and normally not in use)

The power switch is at the back, on a standard power supply:



Order of connections and powering on does not matter, each order will work. There is no need to reboot the box after connections have changed, and there is no physical mechanism to safely power down the box. Fully powering on the box takes about half a minute, and it will take approximately 10 seconds before anything can be seen on the LCD display. This is normal. Boot up is about twice as slow after an unexpected power loss.



*Do not attempt to power off the box unassisted, as this may damage the integrity of the system.* In the event of power loss or accidental unplugging, the system should fully auto-recover by itself. If you suspect it may be malfunctioning, first try to open the live stream yourself on any device. When problems persist, contact the control and monitoring team (see chapter “During the event” for full details). They may already be aware of the problem, but quick reporting helps cut down on reaction times.

While the box contains a network switch (all three ports are connected), *do not connect your own equipment* to the box. The boxes are on a special subnet with reserved bandwidth for the video streaming, and any other equipment may compromise the quality of the broadcast.

*The slides boxes are VGA-only.* The internals are HDMI-compatible, but the ULB campus projection system only supports VGA. HDMI to VGA converters will be provided for each room. The VGA signal is automatically scaled to 720p (1280x720) at 50Hz. Matching this on the presenter laptop is a good idea, but not a requirement.

*The LCD display will inform you of all vital information about the current status of the box.* It shows a preview of the stream image (auto-refreshing screenshot, not live video), the current input resolution and refresh rate (should be 720p at 50Hz), its network status (connected/disconnected), the recording status (yes/no), the streaming status (yes/no) and audio volume level (average over the last few seconds).

The boxes report all this information to control while their network status is good, where the control and monitoring team keeps an eye on all rooms. If something is wrong, they may send somebody your way to correct it. Please follow the instructions (if any) of video team members. Keeping an eye on the box vitals and correcting any problems you notice is encouraged.

## 4 Tripod

More details coming soon.

## 5 Camera

FOSDEM2017 will use 2 different camera models: the Sony HXR-NX100 and the Canon XF100E.

### 5.1 Standard settings for both cameras and quick check list

Resolution	1280x720
Refresh rate	50p
MIC-CHANNEL1(left)	Speaker and audience microphone
MIC-CHANNEL2(right)	Internal microphone
Power source	Cable AND Battery
Lens cover	Remove!
Camera/Tripod	Cam must be attached to tripod plate

### 5.2 Setup for Sony HXR-NX100 (large and extra large rooms)

#### 5.2.1 Screw camera on mount

Screw the camera onto the tripod. Every camera has a screw hole at the bottom that can be used for this. The plate has a distinct “point camera in this direction”-arrow, pay attention to this. The screw can be tightened by a coin or similar object.

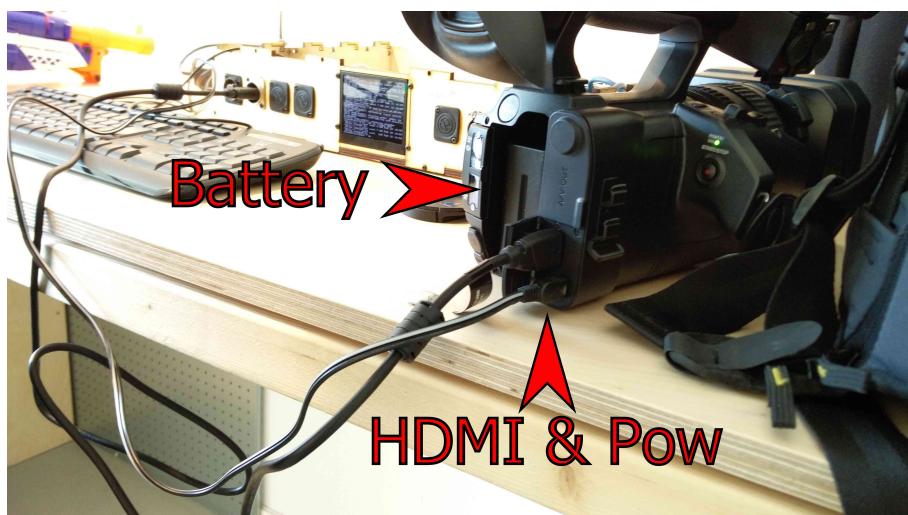


### 5.2.2 Power and HDMI connectors

First plug in the battery at the back, then plug in both the HDMI and the power cable.

Both connectors can be found next to each other to the right of the battery slot at the back. Look at the picture if you're unsure.

Do not forget to hook up the other end of the HDMI cable to the FOSDEM Video Box, and the power cable into the mains.



### 5.2.3 Microphone

Plug the XLR cable of the audio system into Input1.



#### 5.2.4 Power on

You can find the power button on the left side of the camera (looking from behind). Look in the bottom right corner.



#### 5.2.5 Factory default settings

Does the camera ask for a time and date? Then you can skip this section, as it already is on factory default settings. Does the camera NOT ask for a time and date? Then we have to reset things.

First we reset all but the picture profile settings to factory default: Menu → "Others" (three drawers icon) → Initialize → OK.

Now we set time and date. Not important. Just clicking the SET button a few times to get through this.



Now, we reset picture profile 4 (the default picture profile) to factory default: Menu → Camera set (camera icon) → Picture profile → PP4 → Setting → Reset → Yes

### 5.2.6 Audio settings

The audio settings can only be done through the hardware switches on the camera. Make sure to set the switches to the correct positions, as these directly affect the availability of audio on the recordings and live streams. Wrong settings means no audio! If unsure, verify with the image below.

Input	Left switch	Middle switch	Right switch	dial
Input1	BOTTOM (Mic 48V)	MIDDLE (EXT MIC)	TOP (AUTO)	anything
Input2	BOTTOM (Mic 48V)	TOP (INT MIC)	TOP (AUTO)	anything



### 5.2.7 Audio levels

To configure the audio levels, use the following procedure for small rooms:

- Set the levels to 5 for both channels;
- For the internal camera microphone (channel 2, small rooms) talk loud near the camera and make sure the levels don't go over the end (using the dial);
- For channel 1 (speaker microphone) yell while wearing the microphone and make sure the levels don't go over the end (using the dial);

For the other rooms:

- Set the levels to 5 for both channels;
- On the mixing console, set a small pan to the LEFT of the speaker microphone;
- On the mixing console, set a small pan to the RIGHT of the rest of the microphones;



- For the speaker microphone yell while wearing the microphone and make sure the levels don't go over the end, adjusting from the mixing console;
- For all the other microphones, talk moderately loudly while adjusting the microphones, making sure that they don't go over the top;
- Adjust the overall volume for the room to be audible as much as possible without creating feedback;
- Additionally test for feedback while moving with the microphone around the PA system in the room and adjust accordingly.

#### 5.2.8 Video output configuration

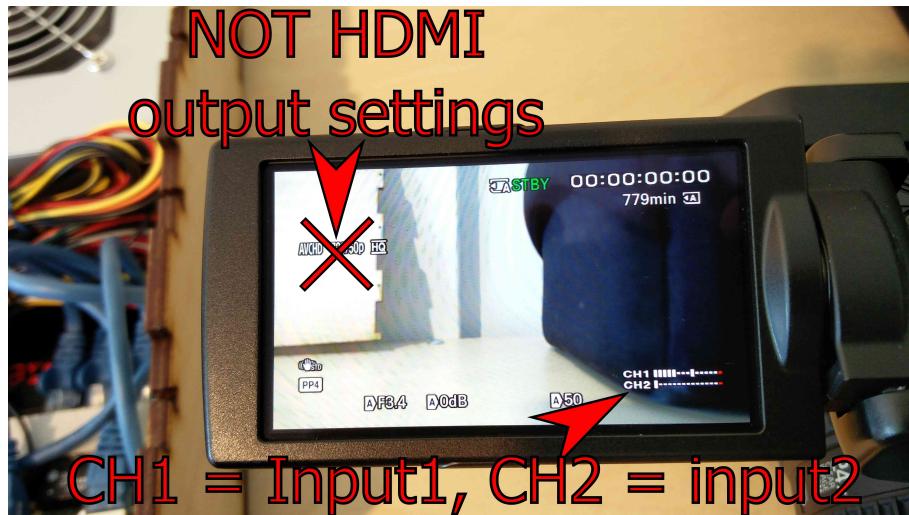
The video configuration will be done through the on-screen display.

Set up like this:

Menu → 2nd icon (two arrows) → Video out → HDMI → 720p.



The resolution information displayed on the OSD relates to recording to the SD card, which we do not use. *Ignore this text*, as the video output config is completely separate from the recording setting on this model.



For rooms with low light conditions only, press button 3 (LOWLUX) to have the camera auto adapt to low light levels. A candle icon appears in the bottom right corner of the OSD screen.

### 5.2.9 Remove the lens cover

Do not forget to remove the lens cover. Store it in the camera bag for safe keeping.



### 5.2.10 Checklist

Please check the following before leaving:

- Does CH1 on the camera display spike when you tap the (powered on) wireless speaker microphone?
- Does CH2 on the camera display spike when you tap the camera itself with your fingers?
- Turn off the wireless speaker microphone before leaving to conserve battery power for during the day.



- Do both video boxes say mode 720p50 on the LCD display?
  - Does the camera video box display the camera image on the LCD display?
- If any of these do not work, re-check your connections and settings. Still no luck? Contract VOC!

### 5.2.11 Contact control

When you have finished setup of the room, please report to VOC for a full test. They will let you know what rooms still need attention.

## 5.3 Setup for Canon XF100E (small rooms)

### 5.3.1 Screw camera on mount

Screw the camera onto the tripod. Every camera has a screw hole at the bottom that can be used for this. The plate has a distinct “point camera in this direction”-arrow, pay attention to this. The screw can be tightened by a coin or similar object.



### 5.3.2 Power and HDMI connectors

First plug in the battery at the back, then plug in both the HDMI and the power cable.

The HDMI connector is hidden behind a cover on the bottom of the right side. Power is on the back, to the left of the battery slot. Look at the picture if you’re unsure.

Do not forget to hook up the other end of the HDMI cable to the FOSDEM Video Box, and the power cable into the mains.



### 5.3.3 Microphone

Plug the AVX receiver into CH1. Plug the USB charger cable into the AVX receiver, and the USB charger into the power strip.



### 5.3.4 Headphones

Plug the headphone into the headphone port.



### 5.3.5 Power on

Now please boot the camera. You can find the power button on the top of the left side of the camera (looking from behind).



After booting the camera, please check if:

- the avx microphone receiver should power on (signaling through 48V phantom power)
- the transmitter auto pairs with the receiver. It should show "AVX" plus the latest four digits of the receiver serial on its lcd
- the transmitter battery status. Fully charged, it should indicate approximately 15 hours on the lcd



### 5.3.6 Audio settings

The audio settings can only be done through the hardware switches on the camera. Make sure to set the switches to the correct positions, as these directly affect the availability of audio on the recordings and live streams. Wrong settings means no audio! The position of the dials does not matter (those are for manual volume, we use automatic volume). If unsure, verify with the image below.

Input	Top switch	Middle switch	Bottom switch	dial at top
CH1	LEFT (A)	RIGHT (MIC 48V)	RIGHT (EXT)	anything
CH2	LEFT (A)	LEFT (MIC)	LEFT (INT)	anything



### 5.3.7 Audio levels

To configure the audio levels, use the following procedure for small rooms:

- Set the levels to 5 for both channels;
- For the internal camera microphone (channel 2, small rooms) talk loud near the camera and make sure the levels don't go over the end (using the dial);
- For channel 1 (speaker microphone) yell while wearing the microphone and make sure the levels don't go over the end (using the dial);

For the other rooms:

- Set the levels to 5 for both channels;
- On the mixing console, set a small pan to the LEFT of the speaker microphone;
- On the mixing console, set a small pan to the RIGHT of the rest of the microphones;
- For the speaker microphone yell while wearing the microphone and make sure the levels don't go over the end, adjusting from the mixing console;
- For all the other microphones, talk moderately loudly while adjusting the microphones, making sure that they don't go over the top;
- Adjust the overall volume for the room to be audible as much as possible without creating feedback;
- Additionally test for feedback while moving with the microphone around the PA system in the room and adjust accordingly.



### 5.3.8 Factory default settings

Does the camera ask for a time and date? Then you can skip this section, as it already is on factory default settings. Does the camera NOT ask for a time and date? Then we have to reset to factory default settings before configuring anything.

We reset all but the picture profile settings to factory default: Menu → "Other Functions" (wrench icon) → Reset → All Settings → OK.

The camera reboots. Now we set time and date. Not important. Just clicking the SET button a few times to get through this.

### 5.3.9 Video settings

The video settings will be done through the on-screen display.

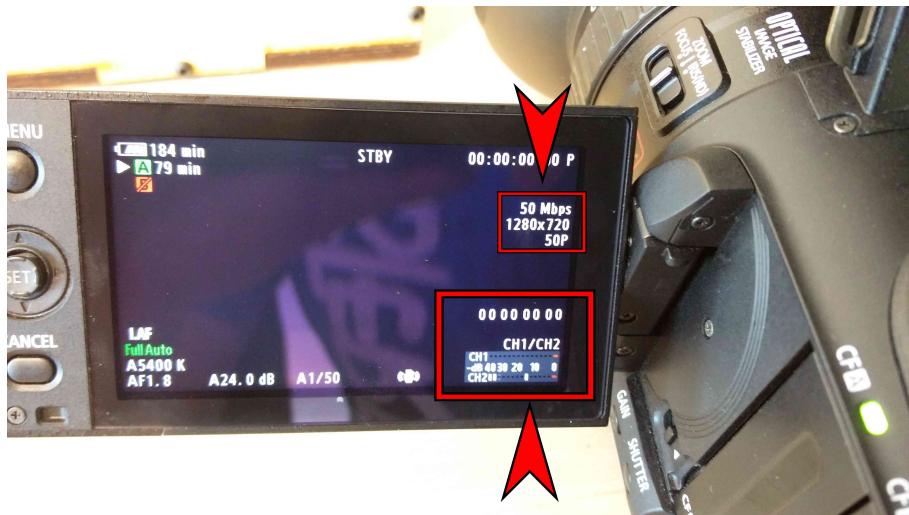
Set up like this:

Menu → Last pictogram (wrench) → Bit Rate/Resolution → 1280x720 50Mbps

Menu → Last pictogram (wrench) → Frame Rate → 50P



With this camera model, the on-screen display will show the configuration that is active during normal operation.



### 5.3.10 Remove the lens cover

Do not forget to remove the lens cover. Store it in the camera bag for safe keeping.



### 5.3.11 Checklist

Please check the following before leaving:

- Does CH1 on the camera display spike when you tap the (powered on) wireless speaker microphone?
- Does CH2 on the camera display spike when you tap the camera itself with your fingers?
- Turn off the wireless speaker microphone before leaving to conserve battery power for during the day.
- Do both video boxes say mode 720p50 on the LCD display?
- Does the camera video box display the camera image on the LCD display?



If any of these do not work, re-check your connections and settings. Still no luck? Contract control!

### 5.3.12 Cage

As most of the rooms will not have a dedicated volunteer to manage the camera, we recommend that for every room after you put in the camera you put two pieces of tape (or if not possible, something else), to mark the left and right end of the field of vision of the camera, so the devroom managers can notify the speakers where to walk and not lose them. It's recommended that this area doesn't make the camera see the projection screen, if possible. Otherwise it's very possible to have flickering on the recordings, or a very very dark image of the speaker.

### 5.3.13 Warn VOC

When you've finished setting up the room, please report this to VOC by walkie and on irc://irc.freenode.net#fosdem-video.

## 6 During the event

It is expected of the devroom video volunteers that they keep an eye on the following, in order of importance:

- The wireless speaker mic is on during talks
- The wireless speaker mic is worn correctly (see below)
- The audio volume is not too low or too high (clipping is bad!)
- The camera is aimed at the speaker, *not* the projection screen (the projection screen is captured separately!)
- None of the video equipment is stolen or tampered with
- The video box is turned on and has OK network status.

The main task is ensuring audio quality. Video quality, while important, is only a secondary concern. A recording without video is still usable, but a recording without audio is completely useless.

The correct way to wear a lapel mic is as follows:

- The microphone is attached at speaker's clothes near the neck, under the chin (centrally);
- There are no necklaces or lanyards that would touch it during the talk;
- There are no scarves or similar that cover the microphone or will touch it;
- The microphone is attached to the topmost layer of clothes (so there's nothing above it that would touch it);
- If there is no place where the microphone can be attached, a lanyard can be used for this purpose, on top of all the clothing of the speaker;
- The microphone receiver is attached to the belt of the speaker. If not possible, it's attached on top of a pocket;
- If the speaker has neither a belt nor pockets, he/she can hold the receiver in hand, or worst case scenario, it can be attached with duct tape to the waist (with a full loop around the waist).



- The speaker is notified that if he's not facing in the direction of the microphone (e.g. not looking straight) the audio will be less audible.

Video team members will be both monitoring remotely as well as visiting rooms with problems. If you have questions, concerns or problems and there is no video team member nearby, contact them through the `#fosdem-video` channel on the Freenode IRC service. If your video box shows issues on the LCD, most likely somebody is already on their way to you. When communicating with video team members, please mention the *room number* as opposed to the devroom name. Devrooms move around, room numbers stay constant.