andor1 **LZX industries**

LZX Industries ANDOR 1 Synchronous Media Player v1.01
User Manual

Contents

ABOUT THE ANDOR 1

A versatile standalone media player for video art, stage production, video walls, signage, and other applications. Multiple units used together can synchronize their playback of video files wirelessly. Andor 1 is incredibly simple to use, but packed with unique features like seamless looping, video rotation options, a built-in playlist editor, still image support, integrated test patterns, and MIDI control. The player was developed by programmer, artist, and curator Paul Slocum and is based on more than a decade of exhibiting video and digital art at his own And/Or Gallery and at other museums and galleries internationally.

Software and manual by Paul Slocum - Manufacturing by LZX Industries
Logo and manual design by Dave Larsen - Our modifications to open-source
Omxplayer can be found on our websites, www.lzxindustries.net and
www.andorgallery.com

QUICK START GUIDE [basic model]

To set up the player, connect the power to the micro-USB connector, hook up either the analog audio/video cable or HDMI video cable to your monitor, and insert a USB stick with your media files. The player sends video to the analog video output when there is no HDMI cable connected.

The player will automatically play the first video on the inserted USB stick. To select a different video, open the menu and choose "select media file". It is not possible to play media in subfolders.

To enter the menus and change settings, plug any USB keyboard into one of the USB ports and press ESC to open the menu. Use the arrow keys to navigate and change settings, and press ENTER to select. Press ESC again to exit menus.

When the menu is closed, the arrow keys jump forward or back in the playback, and ENTER pauses the video. When players are synchronized, navigation and pause will affect all the synchronized players.

The player will synchronize playback with other players that are set to the same sync channel when sync is enabled. If the synchronized videos are of different lengths, then the shorter videos will be padded with blank video at the end to make them the same length as the longest video on the channel.

The Playlist Editor allows the creation of simple playlists, but it also allows keyboard keys and MIDI notes to be assigned to playlist items. The Playlist Editor automatically assigns a default keyboard key to each item in a playlist. Key and MIDI playlist triggers will affect all players on the same sync channel when used with synchronization.

Note that all changes to player settings are saved to a file on your USB drive rather than to the player itself. The settings file is called andorSettings.cfg and it is a text file that can be edited by hand.

The recommended video format is H264/AAC using a .MP4 or .MKV container.

QUICK START GUIDE [deluxe model]

To set up the player, connect the power to the micro-USB connector, hook up either the analog audio/video cable or HDMI video cable to your monitor, and insert a USB stick with your media files. The player sends video to the analog video output when there is no HDMI cable connected.

One of the 4 USB slots is occupied by the remote control transceiver, which is a tiny black USB plug. But any of the other 3 USB slots can be used for the USB stick with your media.

The player will automatically play the first video on the inserted USB stick. To select a different video, open the menu and choose "select media file". It is not possible to play media in subfolders.

The player will synchronize playback with other players that are set to the same sync channel when sync is enabled. If the synchronized videos are of different lengths, then the shorter videos will be padded with blank video at the end to
make them the same length as the longest video on the channel.

The two menu buttons on the remote both open and close the menu, and the menu can be navigated with the directional pad and 'OK' button to change settings. The power button toggles sleep mode, and the volume controls adjust the media volume. The button with the mouse icon that turns on the remote's "air mouse" is not used at this time.

When the menu is not open, the directional buttons jump forward or back in the playback, and OK pauses the video. When players are synchronized, navigation and pause will affect all the synchronized players.

Keys on the QWERTY keyboard on the reverse side of the remote control can be assigned to play videos and media using the Playlist Editor. The editor will automatically assign a default keyboard key for each item in a playlist. It is also possible to assign MIDI notes to playlist items. Key and MIDI playlist triggers will affect all players on the same sync channel when used with synchronization.

Note that all changes to player settings are saved to a file on your USB drive rather than being saved to the player itself. The settings file is called andorSettings.cfg and it is a text file that can be edited by hand.

The recommended video format is H264/AAC using a .MP4 or .MKV container.

PARTS LIST [deluxe model]

- Andor 1 media player
- Andor 1 user manual
- AC power supply
- 6 foot micro USB power cable
- 3.3 ft micro USB power cable
- 1 ft micro USB power cable
- Color coding dots
- Wireless remote control keyboard/air mouse
- 8GB USB storage drive
- 6 foot slim HDMI cable
- 6 foot Audio/Composite Video breakout cable
- 4x M3 wood screws for fixed installations

PARTS LIST [basic model]

- Andor 1 media player
- Andor 1 User manual
- AC power supply
- 6 foot micro USB power cable
- Color coding dots

PLAYER CONNECTIONS [deluxe model]

Micro USB power port - connect the power supply with any of three the included micro USB cables. Although the Andor 1 uses the same kind of adapter and cable as mobile phones and tablets, common power supplies and micro USB cables often do not provide enough power for the Andor 1. When the player is not receiving enough power, a yellow lightning bolt will appear in the upper right of the screen.

HDMI port - connect the included HDMI cable to this port if you're using a modern high definition TV or monitor.

1/8" audio/video port - outputs analog audio and video and it uses the included 3-way A/V breakout cable. Video output on this port is turned off when HDMI video is being used, but the analog audio is always on.

USB ports - the four USB ports can be used for USB disk drives, the remote control dongle, USB keyboards, and MIDI adapters for triggering playlist events. All of the ports are identical in function.

Ethernet port - the ethernet port is currently not used.

PLAYER CONNECTIONS [basic model]

Micro USB power port - connect the power supply with the micro USB cable. Although it uses the same kind of adapter and cable as mobile phones and tablets, common power supplies and micro USB cables often do not provide enough power for the Andor 1. When the player is not receiving enough power, a yellow lightning bolt will appear in the upper right of the screen.

HDMI port - connect an HDMI cable to this port if you're using a modern high definition TV or monitor.

1/8" audio/video port - outputs analog audio and analog video and uses a special 3-way breakout cable that is the compatible with the Microsoft Zune video cable. Video output on this port is turned off when HDMI video is being used, but the analog audio is always on. This port also is compatible with standard 1/8" stereo audio cables, but they will only have stereo audio without video.

USB ports - the four USB ports can be used for USB thumb drives, USB keyboards or compatible devices for controlling the player, and MIDI adapters for triggering playlist events. All of the ports are identical in function.

Ethernet port - the ethernet port is currently not used.

THE REMOTE CONTROL [deluxe model]

The included remote control sends key commands to the small black USB dongle. The remote's rechargeable battery can be charged directly from the same power supply as the Andor 1, or you can charge it through a USB port using one of the spare micro USB cables. The remote's micro USB charging port is at the base end.

Power button - toggles sleep mode. Most types of HDMI monitors will enter power save mode when the player is in sleep mode.

Volume buttons - raise and lower the volume of playing media.

Direction pad buttons - skip forward or back in playback, and also are used to navigate menus and adjust values.

OK button - toggles pause and play during playback, and also acts as a select button when the menus are open.

Menu buttons - the two menu buttons work identically. They open the menu when it is closed, and act as a 'cancel' button when the menu is open.

Mouse button - toggles the air mouse function, which is currently not used for the player.

QWERTY keyboard - the keyboard on the reverse side of the remote control can be programmed to trigger playlist items.

USING A USB COMPUTER KEYBOARD

Any standard USB computer keyboard can be used to access the menus and other functions.

ESC key - opens the menu when it is closed, and closes menus when they are open.

Arrow keys - skip forward or back in playback, and also are used to navigate menus and adjust values.

ENTER key - toggles pause and play during playback, and also acts as a select button when the menus are open.

PLAYBACK SYNCHRONIZATION

When sync is enabled in the Player Options menu, playback will be wirelessly synchronized between all players that are set to the same sync channel. If the synchronized players have videos or media of different lengths, then the shorter videos or media will be automatically padded at the end with blank, silent video so that all of the media is the same length and start at the same time. The range of wireless sync should be at least 100 feet but may be shorter depending on background radio noise and physical obstructions like walls. Players on the same channel will typically discover each other and lock sync in 30 seconds or less.

THE PLAYER OPTIONS MENU

The Options Menu is the main player menu with the most commonly needed controls and adjustments. It can be toggled open and closed by pressing either of the menu keys on the remote control or ESC on the computer keyboard.
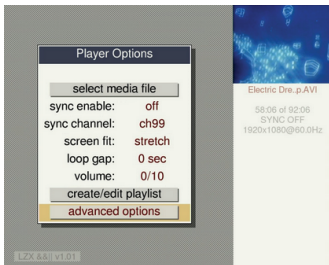
The menu contains the following controls:

Select media file button - opens a menu to choose the current file or playlist that is being played.

Sync enable - turn synchronized playback on or off

Sync channel - the player has 200 synchronization channels. The default channel is 99, but it is recommended to choose a different channel for each installation to reduce the potential of interference between media installations.

Screen fit mode - this setting determines how videos and images are fit onto the screen. The options are letterbox, stretch, and natural. The natural setting does not scale the media and shows it at its exact size pixel-for-pixel.

Loop gap - this setting determines whether any delay is inserted at the end of the media before looping. Set this to zero for seamless looping.

Volume control - for video and audio playback. The range is 0 to 10.

Create/edit playlist button - opens the Playlist Editor. See the Playlist Editor section below for more information.

Advanced options button - opens the Advanced Options Menu, which is described in the next section.

THE ADVANCED OPTIONS MENU

This menu includes additional settings and controls. Press the remote control menu button or the ESC key to return to the Player Options Menu.

Video wall button - opens the video wall configuration window, which is described in the Video Wall Setup section below.

Rotation - allows rotation of media playback in 90 degree increments.

Background color - sets the background color, which is used for letterboxing and is shown during "delays" in playlists.
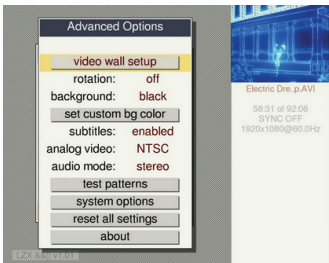
Subtitles - turn subtitles on or off. To use subtitles, include an SRT subtitle file on your USB disk with the same name as your video file.

Analog video - sets the analog video output mode as PAL or NTSC video standard.

Audio mode - in most cases this should be set to stereo. When using 5.1 with a digital surround decoder over HDMI, choose the hdmi thru mode. There is also the option to turn audio off.

Test patterns button - this button opens a menu for displaying a test pattern or solid black, white, or blue video for testing and calibration.

System options button - opens the System Options Menu which is described in the System Options section below.

Reset all settings button - resets all settings to defaults and reboots. It will ask for confirmation first.

About button - displays an information page including the full version number and the device serial number.

THE PLAYLIST EDITOR

Playlists can be created and edited with the integrated Playlist Editor. Its simplest function is to string together a sequence of videos or media files. But the playlist system also has the ability to set up keyboard or MIDI note triggers for playlist items, and it is possible to create loops and delays within the playlist. When the playlist editor first opens, you'll see the media file that is currently playing listed in the playlist. The up, down, left, and right arrow buttons move the cursor through the playlist.
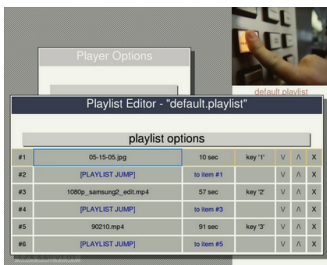
The cursor starts off on the playlist options button, and pressing the down button will move the cursor into the playlist grid. Playback starts at the top of the playlist playing media sequentially until it reaches the end, then it loops back to beginning.

There are 7 columns in the playlist grid. From left to right, they are: playlist item number, playlist item name, duration, trigger key or note, the button "/\" button to move playlist item up in the list, the button "\/" to move the playlist item down, and the "X" button to delete playlist items. Changes to the playlist are automatically saved to the file default.playlist unless the playlist is renamed using the Playlist Options Menu. The Playlist Options Menu includes various tools to help creating playlists, such as functions that automatically create playlists from all the media files on your USB drive. In addition to normal playlist items, playlist delays and playlist jumps can be inserted into the playlist. A playlist delay plays silent, blank video for a variable amount of time, and a playlist jump skips to another location in the playlist.

Each media item in a playlist is automatically assigned a keyboard trigger, starting with the '1' key (on your USB keyboard or the back of the remote control) and progressing along the keyboard ('2','3','4'...). The trigger keys can be reassigned to other keys or to MIDI notes. A trigger causes the playlist to restart at the trigger point, and if the player happens to by synchronized with other players, then all the synchronized players will restart their playlists at that same point in their own playlists. Using triggers in conjunction with playlist jumps makes it possible to assign different media loops to keys on the keyboard. Keys that are able to be assigned are 'A' through 'Z' and '0' through '9'.

To add playlist items - position the cursor on the second-from-left column at the vertical position where you want to insert, and then press OK/ENTER. To add an item at the end of the playlist, position the cursor in the "<empty>" slot and press OK/ENTER. A list will pop up showing the available media files and items that can be inserted.
To delete playlist items - click the 'X' in the far right column to delete an item.
To rearrange playlist items - use the '/\' and '\/' buttons to move playlist items up and down in the list.
To change the duration of an image or delay item - position the cursor in the third column and press OK/ENTER
To assign a key trigger - position the cursor over the trigger value, and press OK/ENTER to bring up a menu, or just press the key or MIDI note that you'd like to assign.

SYNCHRONIZED REMOTE CONTROL COMMANDS

When operating synchronized players, remote control and keyboard commands that affect playback are retransmitted to all synchronized players. These command include the pause/play toggle (OK/ENTER), skipping forward and back (arrow buttons), and playlist triggers. Note that when playlist triggers are transmitted to the other synchronized players, the actual key or MIDI note is not transmitted. Instead, it sends the playlist index of the trigger.

THE SYSTEM OPTIONS MENU

This menu is for fine tuning and troubleshooting and probably should not need to be adjusted.
Sync timing - offset for sync timing, typically used when playing synchronized video across different kinds of monitors that have varied display lag. The default value is zero.
Sync trigger delay - this controls the delay when triggering playlist items with synchronization. Because it takes an unpredictable amount of time to communicate with the other players and load the videos, it is necessary to have some delay. The default value is 2 seconds, but it can be set longer if your videos are not loading fast enough. It is also possible to set the delay to 1 second, but it may be less reliable. When sync is off, this value will not be used and media will be loaded as fast as possible. [NOTE: that last part is not yet true, but "faster triggering when sync is off" will be completed soon and activated in an upcoming software update.]
**Vsync lock** - this setting determines how vertical sync timing is adjusted. Some monitors don't respond well to video timing adjustments and lose sync, in which case you may set this value to off or to the gentle mode which reduces the severity of timing adjustments. With vsync lock turned off, the sync accuracy will be plus or minus half the duration of a frame (+/- 8.3ms at 60hz), which is still accurate enough for many applications. It is rare though that this setting will need to be changed. There is also aggressive vsync mode which synchronizes vertical sync faster but is more likely to cause visual distortion when it is first locking.
Refresh rate - normally the player will synchronize to your monitor's default refresh rate, but this control makes it possible to automatically change the monitor refresh rate to match the playing video. In most cases it will probably be preferable to have this off since it will cause the monitor to resync when new videos are loaded, but it may be useful for playing back some kinds of videos with great accuracy at legacy framerates like 29.97fps and 24fps. [NOTE: this feature is not yet completed but will be activated in an upcoming software update.]

VIDEO WALL MODE

Video wall mode makes it possible play a single video spread out across multiple screens without having to edit the video into cropped segments for each screen. To use this feature, put the same video on the USB stick of each player and turn on video wall mode in its menu, which is available through a button in the Advanced Options Menu.

In the Video Wall Setup window, set the width and height of the monitor grid that you are using, and also set the grid column and position for each monitor accordingly. Adjust the bezel percentage based on how much space there is between the actual screen edges in the video wall. The default bezel value is 10 percent.
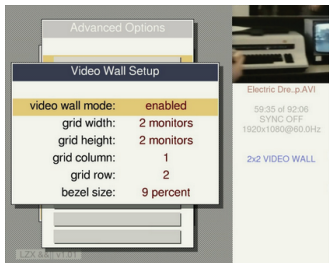
THE MENU INFO COLUMN

Whenever the menu is open, a column on the right under the preview window shows the following player status information.

File name - the currently selected file or playlist

Playlist item name - when a playlist is playing, this line shows the name of the current playing item in the playlist. It will also indicate when a delay has been added to the end of a looping file via the loop gap setting or when the synchronization system pads the end of a file with a delay to match the lengths of the other loops.

Time indicator - this shows the current time and total time of the currently playing file or playlist.

Sync indicator - indicates the status of sync: off, seeking, or locked.

Video mode indicator - this line indicates the current resolution, refresh rate, and mode of the player's video output.

Sync offset indicator - this indicator only appears if the sync offset setting is set to a non-zero value. (in System Options)

Overscan indicator - this indicator only appears if overscan is set to a value other than the default. (under System Options)

Video wall indicator - this indicator only appears when the video wall mode is on. (under Advanced Options)

Audio mode indicator - this indicator only appears when the audio output is turned off or set to HDMI passthrough. (in Advanced Options)

THE CONFIGURATION FILE

All changes to settings on the player are saved to the andorSettings.cfg configuration file on the USB drive. It is a human readable text file that can be edited with a text editor. No settings are saved to the player itself.

SOFTWARE UPDATES

Software updates can be downloaded from www.lzxindustries.net. To install an update, copy the update file to your USB drive, insert it into the player, and open the menu. The player should automatically find the update and display a window confirming the installation.

MIDI MENU CONTROL

MIDI notes can be assigned to playlist items as described in the section about playlists, but it is also possible to control the menus and simulate a limited set of keypresses using MIDI controller messages. The MIDI controller messages are mapped as follows:

controller number: 119 value: 127 = menu button
controller number: 118 value: 127 = left
controller number: 117 value: 127 = right
controller number: 114 value: 127 = up
controller number: 116 value: 127 = down
controller number: 115 value: 127 = OK/Enter

COMPATIBLE ACCESSORIES

USB MIDI adapters - most simple 1-in / 1-out USB MIDI interfaces should work.

USB keyboards - the player works with any common USB computer keyboard. There are also specialty keyboards available like keyboards that only have one key, which could be used to allow viewers to restart a looping video at the beginning.

Remote controls - many wireless USB remote controls interface to the computer as a USB computer keyboard, and these kinds of remote controls should generally work, although some of them use unusual key codes for the buttons that may not be compatible.

Analog 1/8" A/V breakout cable - the cable is a 1/8" tip-ring-sleeve connector to red/yellow/white RCA connectors, but there are a lot of cables like this with different wirings. Look for cables for the 'Microsoft Zune' or 'Raspberry Pi'.

Digital audio output adapters - it is possible to extract SPDIF digital audio output or use a different DAC by tapping the audio through the HDMI port. There are many converters available that pass through HDMI video and extract SPDIF and/or high-quality analog audio. The player currently does not support USB audio adapters.

5.1 decoding - it is recommended currently to use a proper A/V receiver to decode 5.1 through HDMI. We have tried some of the low cost 5.1 decoders on Amazon and so far none have worked properly.

TECHNICAL SPECIFICATIONS

- **Dimensions: 3.75 x 2.5 x 1 inches**
- **Video specification: up to 1080p @ 60fps, up to 40Mbps**
- **H264 support: level 4.1 High Profile**
- **Video codecs: H264, MPEG4, MJPEG, VP6, VP8**
- **Video containers: AVI, MOV, MP4, FLV, MKV**
- **Recommended video format: H264 with MP4 or MKV container**
- **Audio formats: MP3, WAV, AIFF, FLAC**
- **Still image formats: JPEG, PNG, TIFF, PSD**
- **A/V outputs: HDMI, composite video, analog audio**
- **Other ports: USB x 4, micro USB power input**
- **Supported file systems: FAT, NTFS, HFS+, EXT**
- **Supported audio: AC3, DTS, 5.1**
- **Subtitle support: SRT filest**

TROUBLESHOOTING

No video when using the HDMI output
- Try removing the USB drive to see if the test pattern appears (make sure it's not showing blank video)
- Try cycling power to the player
- Try a different or shorter HDMI cable. Some longer HDMI cables require a lot of power to drive.

No video when using the analog video output
- Try removing the USB drive to see if the test pattern appears (make sure it's not showing blank video)
- Make sure there is not an HDMI cable plugged into the player
- Using an HDMI monitor, make sure the PAL/NTSC setting is correct for your monitor
- Try cycling power to the player
- Try a different or shorter HDMI cable. Some longer HDMI cables require a lot of power to drive.

When media is playing, it sometimes goes black and says "[delay x seconds]"
- This can happen when you have sync turned on and you are synchronized to another video that is much longer in duration. If you try to synchronize videos that are of different lengths, the player will automatically add blank video to the end of the shorter video to make them all the same length.
- This also occurs when you set loop gap setting to a value other than zero.

Sync stays at 'seeking' and never locks
- Make sure sync is enabled on each unit and that they are all set to the same sync channel.
- Try rebooting all the devices.

[deluxe version] The remote control doesn't work
- Make sure the remote control is charged. The remote can be charged from the Andor 1's power cable.
- If the remote is charged and it still doesn't work, try cycling power to the Andor 1

A message says that the USB drive is read-only
- This sometimes will happen if a drive was not properly ejected from a computer before being removed. Try placing the drive back in the computer, ejecting it, then remove it and plug it back into the player. The HFS+ file system is more prone to this issue.
- If the first step doesn't work, then try reformatting the USB drive.

A red thermometer appears in the corner of the screen
- The player is too hot, improve ventilation or move the player to a cooler location.

A yellow lightning bolt appears in the corner of the screen
- The player isn't receiving enough power. Unplug and reseat the power cable and adapter to make sure the connections are good.
- Although many tablets, phones, and other devices have similar power supplies, most other power supplies and micro USB cables cannot provide enough power. Make sure you are using the power cables and adapter that came with the Andor 1 player.

The player will not read the USB drive
- Reformat the USB drive using a computer. Sometimes USB drives get partially corrupted.

Video flickers black, loses color, or monitor on screen display appears when sync is first established
- There are a few monitors that are sensitive to subtle timing changes on the video output. These problems should go away about a minute after sync is established, but if your monitor is too sensitive then you can turn off vsync lock in the System Options Menu. Setting vsync lock mode to "gentle" may also help the issue without fully disabling vsync lock.

WARRANTY

This product is covered by LZX Industries' warranty, for one year following the date of manufacture. This warranty covers any defect in the manufacturing of this product. This warranty does not cover any damage or malfunction caused by incorrect use – such as, but not limited to, power cables connected backwards, excessive voltage levels, or exposure to extreme temperature or moisture levels.

The warranty covers replacement or repair, as decided by LZX Industries. Please contact customer service via our website (www.lzxindustries.net) for a return authorization before sending the module. The cost of sending a module back for servicing is paid for by the customer.