Timecode Synchronization With GoPro® HERO® Cameras & Multi-View®HD Pro 2

Using Linear Timecode (LTC) With HERO Models 9-12

The newest version of GoPro Labs' firmware upgrade now supports using SMPTE Linear Timecode (LTC) to sync the cameras via the audio input. The GoPro Media Mod kit is required to enable use of the audio input. Multi-View HD Pro 2 will read the LTC timecode from the GoPro video metadata the same way it reads the GoPro Timecode and will be able to sync the video playback of multiple clips. See https://gopro.github.io/labs/control/ltc/. The QRCode to enable this is $RLTC=1.

Using GoPro Timecode (time-of-day) For HERO Models 7-11

The GoPro Labs firmware upgrade (see https://gopro.com/en/us/info/gopro-labs) for HERO models 7-11 (including HERO Bones, Mini, and MAX), have the capability to record timecode in the metadata of the video files. Timecode is built into the standard firmware for HERO12. Multi-View HD Pro 2 can access this timecode for easy synchronization of multiple cameras.

Timecode sync of the GoPro cameras is achieved by using the app "QRControl" from GoPro Labs. It is available in the Android Playstore or the Apple App Store. QRControl will generate a QR code to jam sync all cameras to the same time of day (within +/- 1 frame) or to a specific timecode. The operation is done by placing the phone's screen in front of the GoPro's camera sensor. This is done before the start of recording. Because Multi-View HD Pro 2 can calculate time offsets, each camera can be sync'd independently (i.e., synchronization does not have to be performed at the same time). It should be done periodically—and when the battery is replaced. Using the non-drop Timecode mode is recommended. Detailed information about the GoPro QRCodes can be found at https://gopro.github.io/labs/.

HERO models 7-12 have different time of day sync precision. Accuracy tests were compared among the same model, and mixing models will produce different results. The QRControl displayed timer will lag behind the metadata timecode up to 1 second. The models that we tested were at 60 and 30 fps with Multi-View HD 2 are shown in the table below:

GoPro Model	Typical Accuracy
HERO7	+/-7 frames (no TC at 120/240 fps)
HERO8-9	Not tested, expect <7 frames
HERO10 ❶	+/- 2 frames
HERO11 ❶	+/- 2 frame
HERO12, Bones, MAX, Mini	Not tested

NOTE

❶ For tighter precision, QRControl's timecode calibration feature can insert an offset value in the timecode sync. More information about the TCAL (Timecode CALibration) command can be found at: https://gopro.github.io/labs/control/extensions/.

Recording At High Frame Rates 120fps & 240fps For Slow-motion

It is recommended to set the GoPro frame rate to one of the values 60/30/24fps or 50/25/24fps for use with Multi-View HD Pro 2 for better precision when syncing by timecode. Using higher frame rates, such as 120fps or 240fps, will decrease sync precision but is still usable. Using GoPro Ultra Slow-motion frame rate at 2.7k @240fps will *not* sync high-def videos correctly for cloning. This is due to the proxy files (.LRV) having been created at 120fps instead of 240fps. Consequently, when recording at 240fps, it's best to use 1080p. Then, either proxy files or high-def files can be cloned for slow motion playback at 240fps. However, if video was recorded at 2.7k @240fps, setting Multi-View HD Pro 2 to "Use Proxy for Program Video" and "Use Proxy for Clone Video" will sync, but will only clone proxy files using 120fps.