

Revolution[™] Motor

Operating Instructions



Manufactured by
NCS Products, New York

ncs2007@ncspro.com
1-718-969-0565

<http://www.intervalometers.com>

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Introduction

Congratulations on your purchase of a *Revolution Motor (RM)*. The *Revolution* uses advanced motor driving techniques to minimize vibration for single-frame, time-lapse and sync filming.

When shooting single-frames, the motor is accelerated from the stopped position for least stress on the cameras.

Sync-capable models ramp the motor speed to the target sync speed, then decelerate to a stop.

Overview

The RM consists of the motor unit, which mounts on the camera, and the control box. Power is supplied to the motor unit via a standard 4-pin XLR connector. Pin 1 is ground, pin 4 is positive.

Please refer to the installation instructions provided for your specific motor.

The control box will not be damaged if you plug (or unplug) it from the motor unit while power is applied. However, sometimes the control box will not be properly initialized. Turn the motor power off then on again to reset it, or just hook up the control box before applying power.

The Controls

The control box has a pushbutton, three thumbwheels, and two indicator LEDs.

The three thumbwheels are used to set the filming parameters. The first digit is used to specify what parameter to set, and the second two digits are used to set the value of that parameter.

Time-Lapse Operation

The RM will be in *idle mode* when power is applied. The red light will flash at a 1-second rate. This indicates that the RM is ready to be programmed with your desired filming parameters.

The RM allows three time-lapse parameters to be set. *Exposures*, *shutter speed*, and *interval*.

When first powered on, *exposures* is set to 10 seconds of film (240 frames), *shutter speed* is set to 1/4 second and *interval* is set to 1 second.

Exposures controls how many frames are exposed. *Shutter speed* controls the duration of each exposure. And *interval* is the delay between exposures. Longer intervals compress time more.

If you want to shoot 240 frames of film with a 1/4 second shutter speed at a 1 second interval, you can just turn the first thumbwheel to “4” and press the pushbutton. However, you’ll probably want to pick your own settings.

You *do not* have to enter the three parameters in any specific order. Nor do you have to re-enter them every time you start filming (unless you disconnect power).

Exposures [1:nn]

The RM allows you to set the maximum number of frames to expose (*exposures*). This value is entered in seconds, with each second representing 24 frames of film.

To set 10 seconds of film (240 frames), turn the thumbwheels to 1:10. For one minute of film, turn the thumbwheels to 1:60.

If you set the thumbwheels to 1:01, *exposures* will be set to one frame. This is useful for animation.

To set a value greater than 99 seconds, turn the thumbwheels to 1:00 and press the pushbutton. Both lights will start flashing. Then, turn the thumbwheels to the number of minutes and seconds you wish to film, and press the pushbutton.

For example, setting the thumbwheels to 3:20 will set *exposures* to three minutes and twenty seconds of film (140 seconds total, or 2880 frames).

Shutter Speed [2:nn]

Shutter speed can be set to 1/8th, 1/4th, 3/8th, or 1/2 second (all crystal-controlled). Or, you can set a long-duration exposure up to 4 minutes.

Refer to the shutter speed chart. To set a speed of 1/4 second, turn the thumbwheels to 2:02. To set a shutter speed of two seconds, turn the thumbwheels to 2:12. Of course, you must press the pushbutton to enter the speed.

Value	Shutter Speed
2:01	1/8 th sec
2:02	1/4 th sec
2:03	3/8 th sec
2:04	1/2 sec
2:11-99	1-89 secs

Entering shutter speeds longer than 89 seconds is a two-step procedure.

First enter 2:00 and press the pushbutton. Both lights will flash. Then turn the thumbwheels to the desired shutter speed in *minutes:seconds*. The longest exposure that can be programmed is 4 minutes.

For example, 2:00 → 1:00 will give a 1 minute exposure. 2:00 → 3:30 will give a 3½ minute exposure.

If you need a shutter speed longer than 4 minutes, you can turn the shutter 180-degrees so it stops 'open' (0:04 will do this). Then use a long *interval* to expose the frame.

Interval [3:nn]

Interval can be set from 1 second to 9 hours. You can set values from 1 to 99 seconds by entering the desired interval directly. For example, 3:05 will set *interval* to 5 seconds.

For longer intervals, set the thumbwheels to 3:00 and press the pushbutton. Both lights will start flashing. Then, set *interval* in minutes:seconds on the thumbwheels (minutes on the first thumbwheel, seconds on the second and third thumbwheels) and press the pushbutton again.

For example, turning the thumbwheels to 2:30 will set *interval* to two-and-one-half minutes.

To set *interval* in hours and minutes, turn the thumbwheels to 3:00, then press and release the pushbutton. Don't change the thumbwheels. Press and release the pushbutton again, then set the interval in hours:minutes on the thumbwheels (hours on the first thumbwheel, minutes on the second and third thumbwheels). Press and release the pushbutton one final time.

Filming [4:xx]

Turn the first thumbwheel to 4 and press the pushbutton. Filming will start. Once the programmed number of *exposures* has been filmed, the unit will return to idle mode.

The second two thumbwheels can be at any number less than 80 (except for 44 and 50, which have special functions).

To stop filming at any time, press and hold the pushbutton until both lights come on. Release, and the RM will return to idle mode.

The motor will always stop with the shutter closed.

Delay-before-Filming [4:50]

To program a delay before filming, turn the thumbwheels to 4:50 and press the pushbutton.

The next value you enter in will be the number of ¼ hour increments to delay. For example, 4:50 → 4:04 will cause filming to be delayed by one hour. 4:50 → 4:10 will cause filming to be delayed by 2½ hours. During this delay period, the light will flash quickly. Press the pushbutton to abort and return to idle mode.

Changing Interval/Shutter Speed while filming

It is possible to change *shutter speed* and *interval* without stopping and re-starting.

To change *shutter speed*, turn the thumbwheels to 2:nn and press the pushbutton.

To change *interval*, turn the thumbwheels to 3:nn and press the pushbutton. *Interval* will now be nn seconds.

To stop filming, turn the first thumbwheel back to 4 and press the pushbutton.

Presets

The RM has 10 memory locations. These locations store combinations of *exposures*, *shutter speed*, and *interval*. These memory locations are referred to as Presets.

You can program nine of these Presets, accessed by thumbwheel settings of 4:91 to 4:99. Preset 4:90 is special—it stores the values used the last time the RM was run.

To program a Preset with the current settings of *exposures*, *shutter speed*, and *interval*, first turn the thumbwheels to the desired Preset number minus 10 (between 4:81 and 4:89). Then, press and release the pushbutton. The Preset will be programmed, and will hold those values until reprogrammed.

For example, to program Preset 99, first set *exposures*, *shutter speed*, and *interval* as described earlier. Then, turn the pushbuttons to 4:89 and press the pushbutton. Now Preset 99 is programmed. Turn the thumbwheels to 4:99, press the pushbutton, and filming will commence.

Automatic Filming with Preset 99

If you apply power to the RM with the thumbwheels set to 4:99, it will automatically start running with the contents of that preset.

This is useful if you have the power source to the RM controlled by a timer or hooked up to a switch.

Automatic Filming of Multiple Presets [8:90-8:99]

The RM has a useful feature that allows you to tell it to film using the contents of multiple Presets, one after the other. This is called *chaining*.

For example, let us say Preset 91 contains an *interval* setting of 1 second and an *exposures* setting of 240 frames (10 seconds of film). Preset 92 contains an *interval* setting of 5 seconds and a *exposures* setting of 120 frames (5 seconds of film). To chain from Preset 91 to Preset 92, so that first 10 seconds of film are exposed with an interval of 1 second, and then 5 seconds of film are exposed with an interval of 5 seconds, do the following.

Turn the thumbwheels to 8:91 and press and release the pushbutton. Both lights will start flashing. Turn the thumbwheels to 8:92 and press the pushbutton.

You can chain from any Preset to any higher Preset, for example, 91 to 99, or 93 to 96, but not from a higher Preset to a lower Preset.

To finish with the current exposure sequence but cancel pending exposure sequences, turn the thumbwheels to 8:00. To cancel all exposure sequences and stop filming immediately turn the thumbwheels to 8:00 and press the pushbutton

Sync Filming [6:nn]

Sync-enabled units can turn the camera at sync speeds. The highest sync speed is different in the different *Revolution* models.

For the Bolex and Eyemo models, turn the thumbwheels to 6:24 for a 24 fps filming speed. Press and release the pushbutton to start filming. Press again to stop.

Bolex and Eyemo sync motors shipped after October of 2004 have the 0.1% slower video speeds built-in. Use 6:23 for 23.976 and 6:29 for 29.970.

The motor is accelerated to the target speed. When accelerating, the red light will be on. When sync speed is reached, the green light will turn on.

Generally, you won't know in advance how long the shot will be. But if you do know how long the shot will be, or would like to limit the maximum length of a shot, you can preset the maximum number of *sync exposures*.

Sync Exposures [7:nn]

The Eyemo and Bolex models allow you to preprogram the number of seconds of film you want to expose when using mode 6. *Sync exposures* is set the same way as time-lapse exposures are set (mode 1). When powered on, *sync exposures* is set to 2 minutes.

For example, if you'd like a 30-second take, turn the thumbwheels to 7:30 and press the pushbutton. When you film at sync, the camera will stop after 30 seconds of film have been exposed.

Default Frames/Second

When setting *exposures*, the *Revolution* control box assumes 24 frames equals 1 second of film. For example, when you set *exposures* using 1:10, 240 frames will be exposed.

If you use the 25-fps system, you can change the frames/sec value to 25. Then, setting *exposures* using 1:10 will expose 250 frames.

Do this carefully, because if you enter the second number wrong, you can overwrite the wrong configuration variable. That might be bad.

It's a three-step procedure. First, enter 5:00. Press the pushbutton and both lights should start flashing. Next, enter 5:24. Again press the pushbutton and both lights should still be flashing. Finally, enter 5:25. Lights stop flashing. Enter 1:02 to program 50 frames and run to confirm that it stops after 50 exposures.

If you are transferring at 30 fps enter:

- 5:00→5:24→5:30

To return to the original USA setting enter

- 5:00→5:24→5:24

Note that this has nothing to do with sync-speed running (on sync-capable models). For 24-fps sync-speed, use 6:24. For 25-fps sync-speed, use 6:25.

Sync Ramp Speed

The *Revolution* control box allows you to change the acceleration and deceleration of the motor when running at sync speeds.

The rate at which the camera ramps up to speed is set by RAMP_UP. The rate at which the camera slows down is set by RAMP_DOWN.

The default value of RAMP_UP is 4,8 and 9 for the Bolex, Eyemo and Arri II cameras respectively,

The default value of RAMP_DOWN is 2,4 and 5 for the Bolex, Eyemo and Arri II cameras respectively.

Lower values for RAMP_UP will make the camera accelerate faster. This will save on film but might cause the motor to stall.

Lower values for RAMP_DOWN will make the camera decelerate faster. This will also save on film but can make the camera jerk to a stop.

You can change the value of either or both of these variables.

Quick way:

5:25→5:nn where nn is RAMP_UP.

5:23→5:nn where nn is RAMP_DOWN.

Permanent way:

5:00→5:25→5:nn for RAMP_UP.

5:00→5:23→5:nn for RAMP_DOWN.

The quick way will use the values you entered until you disconnect power. The permanent way will keep the values permanently (or until you change them again).

So you can use the quick way for experimentation then use the permanent way once you've figured out the values that work best for your camera/magazine setup.

You can also change these values for artistic effect. Setting a large value for RAMP_DOWN will give flash frames at the end of each shot.

<end>

Revolution Operating Summary

The first digit on thumbwheels is the control digit.

0 - Manual Advance

1 - Exposures (in seconds)

2 - Shutter Speed

3 - Interval

4 - Run

5 - Special Function

6 - Sync Running

7 - Sync exposures

8 - "Chaining"

0 - Manual Advance

The motor will rotate while the pushbutton is held down. Set the speed (from 10-90) on the thumbwheels (lower is faster). Or use 0:01-0:08 to advance the shutter in 1 to 8 1/8th frame increments.

1 - Exposures

Enter the number of seconds of film you wish to expose on the thumbwheels (1 second equals 24 frames).

2 - Shutter speed

Value	Shutter Speed
2:01	1/8 th sec
2:02	1/4 th sec
2:03	3/8 th sec
2:04	1/2 sec
2:11-1:99	1-89 secs

3 - Interval

Enter the interval in seconds on the thumbwheels.

4 - Start Time Lapse

4:50 → 4:nn delay nn ¼ hours.
4:44 bulb mode

6 - Sync Running

Run at the speed on the thumbwheels. Use 6:23 for 23.976 and 6:29 for 29.970 (Bolex, Eyemo models only).

7 - Sync exposures

Seconds of film to expose when sync running (Bolex, Eyemo models only).

Change Sync Ramp Speed

Quick way:

5:25→5:nn where nn is RAMP_UP.

5:23→5:nn where nn is RAMP_DOWN.

Disconnect power to return to default value.