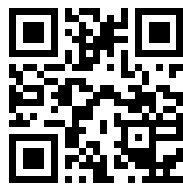


User Manual

Drive designed for sequential as well as in motion shots.
The cart is driven by a stepper motor connected to the controller.

HKN-1 stepper drive for Slide Kamera HSK series



PDF version of the manual available for download: www.slidekamera.eu

Before you start your work with HKN-1 stepper drive for Slide Kamera HSK series we strongly recommend to read the manual carefully.

Please note that using the drive in a manner inconsistent with the instructions, unauthorized repair attempts or any kind of modification of the drive can cause a damage the manufacturer is not responsible for.

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1. Elements of the drive

Once the shipment is received please make sure that all the components of HKN-1 stepper drive are inside.



The set includes:

- ✓ HKN-ST controller [1]
- ✓ Driving motor [2]
- ✓ Cable connecting the motor with the controller [3]
- ✓ AC Adapter [4]
- ✓ Battery cable [5]
- ✓ Limit switches [6]
- ✓ Toothed belt [7]
- ✓ Bump stops [8]
- ✓ Cover plates for legs [9]
- ✓ Double-sided tape [10]
- ✓ Cable release - 1 item to choose from [11]

Cable releases trigger the shutter in the photo camera. Used in ANIMATION, TIMELAPSE and PANORAMA modes:

- ✓ **HKN-WS-1** intended for cameras such as Canon EOS 1V, 3, 5, 1D, D60, 1Ds, 1D Mark II, 1Ds Mark II, 1D Mark III, 1Ds Mark III, 10D, 20D, 30D, 40D, 50D, 5D, 5D Mark II.
- ✓ **HKN-WS-2** intended for cameras such as Canon Powershot G11, G12, EOS 50, EOS 50E, EOS 300, EOS 3000, EOS 500N, EOS 500, EOS 5000, EOS 3000N, EOS 300V, EOS 300X, EOS 300D, EOS 350D, 400D oraz 450D, 500D, 550D, 600D, 60D oraz 1100D.
- ✓ **HKN-WS-3** intended for cameras such as Nikon D700, D300D, D300, D200, D3X, D3S, D3, D2X, D2H, D2, F5, F6, F100, F90x, D100 z MB-D100, Fuji Finepix S3 pro, S5 pro, Kodak DCS-14n
- ✓ **HKN-WS-4** intended for cameras such as Nikon D90 D5000 D5100 D3100 D7000
- ✓ **HKN-WS-5** intended for cameras such as Nikon D80 D70/s
- ✓ **HKN-WS-6** intended for cameras such as Panasonic LUMIX GH1, GH2, GH3

2. Construction

2.1. Controller

The controller is equipped with two knobs. One to adjust the speed range, and the other to control smoothness of motion, i.e. we set certain acceleration thanks to which it is possible to achieve the desired speed very smoothly. Electric connectors sockets and the power switch are located on the side wall of the controller housing. Programming, controlling and configuration are possible with a use of joystick. Simple and functional menu provides the ergonomics of operation.

- DAMPING knob [1]
- Power switch [2]
- Motor connector [3]
- Power connector [4]
- Joystick [5]
- SPEED knob [6]
- LCD display [7]
- Mounting hole 1/4" [8]



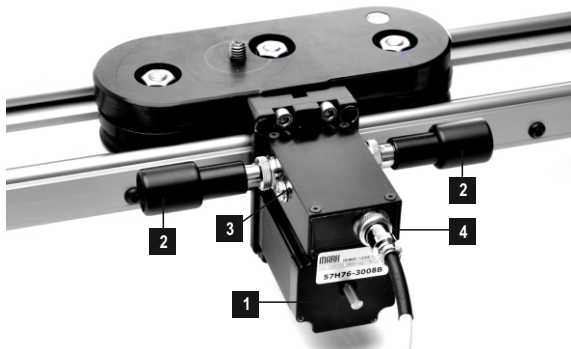
2.2. Power unit

Electric drive motor is screwed to the cart in the place of the parking brake. Transmission of the power is achieved by toothed wheel moving on the toothed belt attached to the rail.

There are four sockets on the motor housing:

- ☒ two limit switch sockets
- ☒ controller connection socket
- ☒ cable release connection socket

- Driving motor [1]
- Limit switch [2]
- Cable release socket [3]
- Controller connector [4]



3. Mounting the electric drive

3.1. Toothed belt

In order to mount the electric drive to the Slide Kamera HSK Series turn the device upside down.



Determine the starting point for sticking toothed belt (it should be applied on the side of a parking brake of the cart) and mark a line (using a pencil) placed 5 cm from the edge of the aluminum profile.



Apply the attached double-sided tape at the edge of the aluminum profile starting from the selected location and then unstick the cover of the tape (remember, do not remove the cover of the tape before it is completely stuck on). Attach the toothed belt at the edge of the aluminum profile.



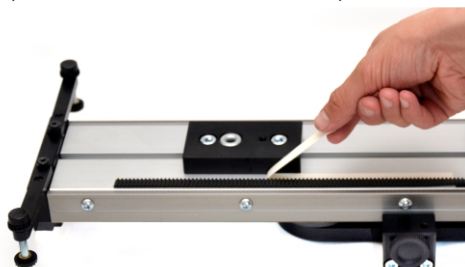
Toothed belt



Using a sharp knife (for example, wallpaper knife or a scalpel) remove the excess of double-sided tape.

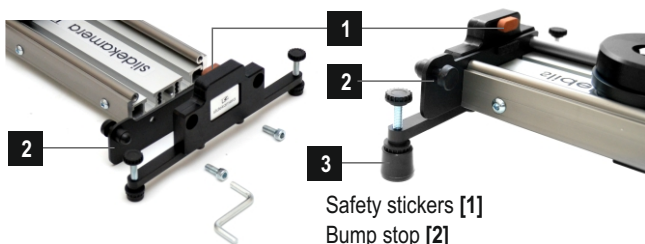


Properly mounted toothed bar.



3.2. Bump stops

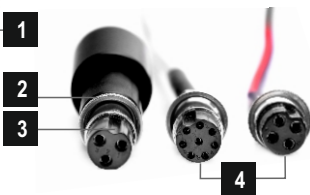
Unscrew the side feet (5mm hex Allen key). Mount the bump stops between the aluminum profile and the side feet. Stickers protecting the cart from hitting should be turned towards the rail.



- Safety stickers [1]
Bump stop [2]
Cover plates for legs [3]

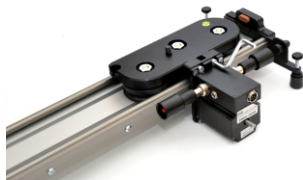
3.3 Power unit

Connect the limit switches (pay special attention so that retaining PIN of the sockets enters the socket in the cable plug as well as the limit switch) then tighten up the safety nut.



- Retaining PIN in the socket [1]
Safety nut [2]
sockets in the limit switch [3]
sockets in the cable plug [4]

Unscrew the parking brake of the cart and screw the power unit instead. After that, use your hand to slide the cart to the extreme positions of the Slide Kamera making sure that limit switches hit the bump stops. Next, attach the cable that connects the power unit with the controller.



After switching on the power the startup screen appears on the LCD for about 1,5s.

Before you start working with the drive make sure that the cart reaches the end of the Slide Kamera. Use the controller to determine the direction of the movements. You can select the direction by moving the joystick either left or right. After reaching the limit of movement range the following message appears: *slider ready press OK*". Press joystick for "OK". After pressing the joystick the controller main menu appears. The main menu has five elements.: "VIDEO", "ANIMATION", "TIMELAPSE", "PANORAMA" and "CONFIG". Use the joystick to navigate. Press the joystick to enter the selected submenu.

3. 4. CONFIG Menu

CONFIG menu has 5 functions. "[Info]", "Power", "Backlight", "[Calibration]" and "<Back>". The list boxes in square brackets [] indicate functions generating own screen. To activate them, press the joystick. At the end of each submenu there is "<Back>". Pressing the joystick in this field results in returning to the main menu. The remaining fields of the submenu are the parameters, next is the value of the parameter. To change the value move the joystick right or left.

[Info] - information about the voltage supply ("Vin") and stored range of motion of the cart ("L").

Power - 25/50/75/100% engine power. Setting a lower power can significantly increase the working time on the battery supply.

Backlight - adjusts the brightness of the LCD

[Calibration] - determines the range of motion of the cart. Calibration should be performed every time the motor is attached to the cart. After entering the [Calibration] the controller awaits for the user's instructions. Please indicate in the first instance the direction in which the motor should move. Once the calibration is finished the value of range of motion of the cart is displayed. Pressing the joystick during the process results in stopping the power unit and terminating the procedure.

<Back> - return to the main menu.

4. VIDEO Mode

VIDEO menu has 5 functions. "[Free Ride]", "[Recording]", "[Playback]", "[VideoLoop]" and "<Back>".

4. 1. FreeRide

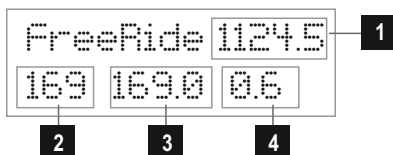
FreeRide mode controls the speed of the cart with the use of a joystick and knobs. SPEED knob sets the absolute value of the maximum velocity (Vmax). Currently set point speed (Vzad) corresponds to the horizontal deflection of the joystick. DAMPING knob is used to determine the suppression of the set point signal (allows to achieve very smooth acceleration and deceleration of the cart). Pressing the joystick causes the motor to stop immediately and returns to the VIDEO menu.

Position of the cart [1]

Vmax [2]

Vzad [3]

Damping [4]



Cart position – the position of the cart in mm. Measured from the left bump stop.

Vmax - the absolute value of the maximum set point velocity measured in mm/s

Vzad – currently set point value of the velocity of the cart measured in mm/s

Damping - damping the value of the set point velocity, for example, the value of 3 indicates that the maximum speed of the cart will be reached after 3 seconds.

During the track, you can change the parameters freely at any time.

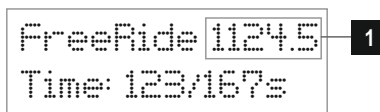
4.2. Recording

Recording mode is designed to record the movements of cart in order to play it back later. Movement control in this mode is carried out in the same way as in FreeRide mode. Press the joystick to end the recording and exit to the menu. The controller can memorize at least 60 seconds of the recording. Maximum time is even 999s. The recorded movement is stored until the power supply is switched off.

4.3. Playback

Playback mode is designed to play saved movements of the cart. When you enter the Playback program it is possible to: start the playback from the current position (move the joystick to the left) or return to the position the cart was moving from during the recording (move the joystick to the right). During the playback, the LCD displays the current position of the cart, the remaining and the overall recording time.

Position of the cart [1]



Pressing the joystick during playback causes the motor to stop immediately and returns to the VIDEO menu.

4.4. VideoLoop

During the **VideoLoop** mode the cart automatically turns back and starts moving in the opposite direction once it reaches the end of the movement range. The user can change the speed (speed knob) and the time during which the cart slows down or speeds up (damping knob) at any time. During the track the LCD displays the set point speed, deceleration /acceleration time and the current position of the cart. Pressing the joystick during the track causes the motor to stop immediately and returns to the VIDEO menu.

5. ANIMATION mode

Animation mode allows to program the track of the cart and to take series of photos (the drive will trigger the shutter release itself through a cable connected to the camera).

ANIMATION menu has the following functions:

Direction – cart movement direction for a growing step.

HomePos - starting position (in mm) from which drive in ANIMATION mode launches.

Step - step length in mm.

Steps - number of steps. The controller itself determines the maximum number of steps based on the starting position (HomePos) and the selected movement direction.

Shots: - number of shots after the cart stops.

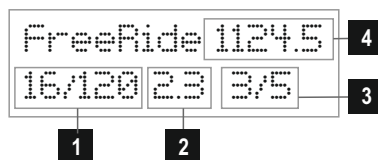
[Start] – chooses the ANIMATION mode

<Back> - Back to main menu

After choosing the ANIMATION mode it is possible to: start with the current position (move the joystick to the left), or set the cart at the starting position (move the joystick to the right).

Once the track ends and the shots are taken the controller awaits for the user to move to the next step. To select the step move the joystick left or right.

Current step / number of set steps [1]
 Step length measured in mm [2]
 Number of currently taken shots/ number
 of shots to capture [3]
 Position of the cart measured in mm [4]



6. TIMELAPSE

TIMELAPSE program is designed for interval shots synchronized with a very slow movement of the cart. In **Continuous** mode, the cart moves smoothly with a constant speed. In this case, there is no need to use the cable release attached to the power unit (especially for short exposure times). The release time can be successfully set on the camera, or in the cable release with the interval function.

In **SDS mode (Shot Drive Shot)** the cart moves in steps between the points where you want to take photos. The trigger signal, with a preset duration time (Expos.) is given to the next point before the cart moves. Cable release connected to the socket on the power unit housing enables to synchronize the drive with the camera.

The distance that the drive covers during the track is calculated from the place where the cart is currently located, to the end of the range of movement in a set point direction (Direction).

TIMELAPSE menu has the following functions:

Mode - Continuous / SDS Mode

Direction – cart movement direction

Time – time of the track from 10 min to 99h 99 min

Expos. - duration time of the trigger pulse (from 0.1 to 99.9 s)

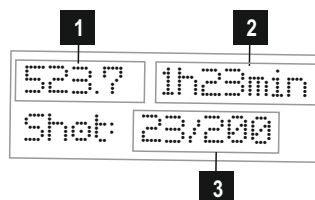
Shots - number of photos to take during the track. The interval between the photos is calculated automatically by the controller. It can be determined from the formula Time / Shots.

[Start] – chooses TIMELAPSE mode

<Back> - back to main menu

Below you can see the explanation of the parameters presented during the track:

Cart position measured in mm [1]
 Remaining time to the end of the track [2]
 Number of currently taken shots / number of shots to capture [3]



Pressing and holding the joystick for at least 2 seconds interrupts the track and exits to the main menu.

7. PANORAMA Mode

Panorama mode is designed to take panoramic photos in both manual and automatic mode.

In order to take panoramic photos you need a vertical Slide Kamera head. The power unit is bolted to the head. The turn-table is installed on the motor axis instead of the toothed wheel. The head is placed for example on a tripod or a mast in a vertical position.

In the manual mode, the shift to the next / previous step is achieved by moving the joystick left or right. After stopping and stabilizing the head you can trigger the shutter. In order to do it move the joystick up.

In the automatic mode the drive rotates by a set point angle, stops, waits for the head to stabilize, takes a photo, turns again and so on.

PANORAMA mode has the following positions:

Prog - a set of stored parameters. The driver stores five sets of the following parameters.

Mode - Mode selection - Auto / Manual

Step ang. - the angle of rotation per one step measured in [°]

Steps - number of steps

Delay - time to stabilize the head. The delay after the power unit stopped until the shutter release.

Expos. - exposure time.

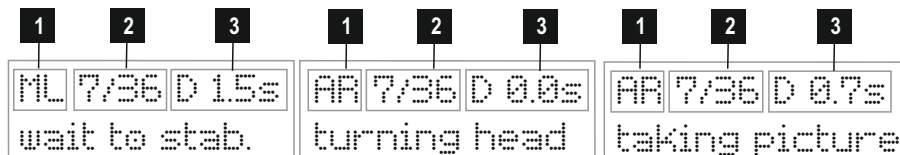
Direction - direction of rotation of the turn-table

!Save! - Stores the set of the above parameters. To store press and hold the joystick for at least 3 seconds.

[Start] – choosing the PANORAMA mode

<Back> - back to main menu

Sample screens during PANORAMA mode:



Mode [1]

Current step [2]

Stabilization or exposure time [3]

WARNING! In PANORAMA mode, the drive does not respond to signals from limit switches. Using PANORAMA mode with the power unit mounted on the Slide Kamera HSK series may damage the device!

8. Technical Specification

Supply	
Supply voltage	12V DC
Current consumption	0,5 - 0,7 A for 100% power 0,2 - 0,5 A for 25% power
Operating time with battery 12V 7Ah (room temperature)	about 14h at 100% power about 40h at 25% power
Cart speed	up to 200mm/s - in VIDEO mode minimally 100mm/99h - in TIMELAPSE mode

9. Available accessories for HKN-1 stepper drive

12V 7Ah AF-7 Power pack

HKN-WS-1 - Cable release intended for cameras such as:
Canon EOS 1V, 3, 5, 1D, D60, 1Ds, 1D Mark II, 1Ds Mark II, 1D Mark III, 1Ds Mark III, 10D, 20D, 30D, 40D, 50D, 5D, 5D Mark II.

HKN-WS-2 - Cable release intended for cameras such as:
Canon Powershot G11, G12, EOS 50, EOS 50E, EOS 300, EOS 3000, EOS 500N, EOS 500, EOS 5000, EOS 3000N, EOS 300V, EOS 300X, EOS 300D, EOS 350D, 400D oraz 450D, 500D, 550D, 600D, 60D oraz 1100D.

HKN-WS-3 - Cable release intended for cameras such as: Nikon D700, D300D, D300, D200, D3X, D3S, D3, D2X, D2H, D2, F5, F6, F100, F90x, D100 z MB-D100, Fuji Finepix S3 pro, S5 pro, Kodak DCS-14n

HKN-WS-4 - Cable release intended for cameras such as: Nikon D90 D5000, D5100 D3100 D7000

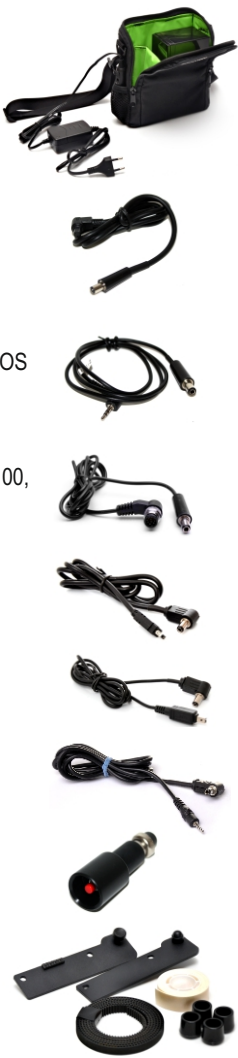
HKN-WS-5 - Cable release intended for cameras such as:
Nikon D80 D70/s

HKN-WS-6 - Cable release intended for cameras such as:
Panasonic LUMIX GH1, GH2, GH3

HKN-KR-1 - limit switch for HKN-1 drive

HKN-1 mounting kit for Slide Kamera HSK-5 / HSK-6

- ☑ HSK-5-OR-1 or HSK-6-OR-1 bump stops (one to choose from)
- ☑ Toothed belt
- ☑ Double-sided tape
- ☑ Cover plates for legs



10. Terms of warranty

All products are covered with Slide Kamera warranty for a period of 12 months from the date of sale. Warranty covers defects in design and material.

The warranty covers repair, or if the repair is impossible, replacing the product with a new one. However the cost of replacing the product cannot overrun the catalog value of the product. The warranty does not cover damage and / or product defects resulting from improper use, as well as non-compliance with maintenance of the product.

The warranty is also void if:

- ☒ unauthorized attempts to repair or modify
- ☒ mechanical damage caused during transport and operation of such features, scratches, dents, pits, dirt, etc ...
- ☒ flooding, moisture

To obtain warranty service the purchaser should deliver the damaged product with proof of purchase and proof of payment (invoice, receipt, cash) to the point where the equipment was purchased. At the end of each guarantee period, you can purchase a replacement part from the manufacturer or in selected retail outlets listed on **www.slidekamera.pl / www.slidekamera.eu**

Producer after sales service is also available at: HET-CNC sc, 80-175 Gdańsk (Poland), Ul. Kartuska 386

