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Founder of Cinefade

Welcome to a novel form of cinematic expression.

Cinefade allows filmmakers to vary depth of field in a single shot at constant exposure, enabling the gradual transition between a sharp and a blurry background.

In partnership with cmotion of Austria, London-based filmmaker Oliver Janesh Christiansen has developed a unique system. The in-camera effect immerses the viewer in a story or makes a client's product stand out in a commercial, enabling a whole new form of cinematic expression and gives cinematographers an opportunity to explore the vast creative potential of a variable depth of field.

"Cinefade is a really useful and very subtle tool to use in moments of extreme drama. A way of immersing an audience inside the mind of a character during a pivotal moment." - Christopher Ross BSC

Cinefade uses a cmotion cPRO lens control system to vary iris diameter, changing depth of field. The Cinefade VariND filter sits inside a matte box and automatically keeps exposure constant by slaving the filter motor to the iris motor.

The Cinefade VariND can also be used as a simple variable ND filter or RotaPola that is easy to mount to become a practical tool. Filmmakers can remotely change ND values whenever the camera is inaccessible and dynamically control the VariND, for example to adjust exposure during INT to EXT Steadicam shots.

Since Cinefade is a new addition to the cinematic language, there is no preconception of what to do and we look forward to seeing how you will use this novel form of cinematic expression.

HOW CINEFADE WORKS

The cmotion cPRO lens control system and the cmotion Cinefade VariND are attached to any camera and lens.

The iris is gradually opened or closed to vary depth of field.

The variable ND filter is slaved to the iris motor and automatically keeps exposure constant.

RANGE OF UP TO 5+ T-STOPS

The Cinefade VariND achieves a light extinction of up to 5 stops without any colour cast. It is possible to extend the range up to 7 stops but a small yet barely noticeable colour cast is introduced into the image.

1.5 STOPS INITIAL LIGHT LOSS

At full light transmission the VariND loses 1.5 stops of light (~ND0.4).

COMPATIBLE WITH ALL CAMERAS AND LENSES

The system is compatible with all analogue film and digital cameras and most modern cine-lenses with a geared aperture ring and accurate T-stop markings.

Vignetting occurs on focal lengths below 15mm.

0.5 SEC MAX CINEFADE SPEED

The fastest 5-stop Cinefade speed is around 0.5 seconds (depending on lens and motor). When operating the iris slider faster than this, a small exposure jump may occur.

IN PARTNERSHIP WITH

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CINEFADE KIT

HIRE KITLIST

cmotion Cinefade VariND - Motorised Polariser

The motorised filter tray holds one of the two custom ARRI circular polarisers and is connected via an LBUS cable to either a cPRO motor, cPRO camin or directly to a power source.

cmotion Cinefade VariND - Static Polariser

The static filter tray holds the second custom ARRI circular polariser and can be fixed to the Motorised Polariser to be placed into a matte box together.

cmotion cPRO motor

The kit includes one cPRO motor, with a built-in rf module, antenna, bracket and 0.8 gear that should be used for focus or iris control.

ARRI cforce mini motor (optional)

The kit includes one cforce mini motor, bracket, 0.8 gear and attached cable that can be used for focus control or ideally for iris control.

cmotion cPRO hand unit

The cPRO hand unit has a focus knob, iris slider, zoom joystick and VariND thumbwheel, as well as a touchscreen to navigate the menu. An antenna, plain focus marker ring and plain iris strip are included.

cPRO camin (optional)

The camin is a wireless motor box and can be mounted on the camera to remotely control the VariND and RotaPola or a motor. Antenna is included.

Mounting bracket (optional)

Quick release mounting bracket with one 3/8" and two 1/4" screws. Allen Key 2.5mm included

LBUS to LBUS cable

LBUS (4p/m) to LBUS (4p/m) cables in different lengths (0.2m, 0.3, 0.5m, 0.8m).

LBUS to LBUS cable (angled)

LBUS (4p/m/angled) to LBUS (4p/m/straight) cables two lengths (0.35, 0.8m).

LBUS to RS Power

LBUS (4p/m) to RS (Fi 3p/m) in 0.8m length.

LBUS to D-tap Power

LBUS (4p/m) to D-tap (Anton Bauer 2p) cable in 0.8m length.

CAM to LBUS cable

CAM (7p/m) to LBUS (4p/m) cable in 0.5m length.

CAM to CAM cable

CAM (7p/m) to LBUS (7p/f) cable in 0.3m length.

CAM to RS Power

CAM (7p/m) to RS (Fi 3p/m) cable in 0.3m length.

CAM to D-tap

CAM (7p/m) to D-tap (Anton Bauer 2p) cable in 0.5m length.

Batteries

Two cmotion cPRO Lithium-ion batteries are supplied.

Charger and cable

One dual-charger, cable and EU plug are supplied.

Power adapter

A universal travel adapter for local power sockets.

Strap

The strap can be attached to the cPRO hand unit.

Belt clip

Spider black widow belt clip for cPRO hand unit.

Extra motor gears (optional)

A 25mm wide gear (m0.8 40t) for moving lens barrels and a gear for Panavision lenses (m0.4 80t)

USB flash drive

A USB flash drive pre-loaded with recommended User settings and newest firmware

User manual

A hard copy is provided with each kit. A digital version is available at www.cinefade.com/manual

Pelicans case

The Pelicans 1510 has a custom foam insert that fits the entire kit inside a carry-on sized case with wheels. Dimensions (mm) 559 (L) x 351 (W) x 229 (D).

The following **ADDITIONAL EQUIPMENT** is required for Cinefade operation.

MATTE BOX

A 4x5-sized matte box with at least two free filter slots is required to hold the Cinefade VariND filters.

The ARRI LMB4x5 matte box is recommended and the ARRI LMB-5, LMB-15 and LMB-25 are also compatible (see full list on page 16).

ROD SUPPORT

19mm or 15mm rods are required to mount the motors onto the camera system.

POWER

For Cinefade operation it is possible to power the Cinefade VariND and cPRO motor/cPRO camin via LBUS straight from the camera as well as RS Power or D-tap using an LBUS or CAM cable.

CAMERA

Any analogue film camera or digital camera is compatible with the Cinefade VariND. The circular polarisers may interfere with a film camera's viewfinder.

A light sensitive camera is recommended for the Cinefade effect, which requires high light levels to achieve a deep depth of field and to cope with the 1.5 stops of light loss at maximum light transmission of the Cinefade VariND.

LENS

Any cine-lens with a manual, geared aperture ring is compatible with the Cinefade VariND, Fast, prime lenses are recommended for Cinefade operation.

The maximum front diameter compatible with the ARRI LMB4x5 matte box is 162mm.

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SETUP

VARIABLE ND FILTER

Together the Motorised Polariser and Static Polariser act as a variable ND filter using the principle of cross-polarisation. One polariser remains static, while the other rotates up to 90° to vary light transmission.

1. Connect both the Motorised Polariser and the Static Polariser together using the built-in magnets and connector pins.
2. Place both into an LMB matte box with the Motorised Polariser closest to the camera and the Static Polariser towards the subject (as pictured below).

Alternatively place the polarisers into separate filter slots of a matte box.

At maximum light transmission the VariND swallows exactly 1.5 stops of light (~ND0.4) and attenuates up to 8 stops of light (ND2.4) with a maximum Cinefade range of 5 stops within the optical safe range.

MATTE BOX COMPATIBILITY The VariND occupies two filter slots and fits perfectly into the recommended ARRI LMB 4x5 matte box. On some matte boxes the VariND may however not fully slot into place, as the integrated top-mounted motor can present an obstruction.

Matte box	Compatibility
ARRI LMB 4x5	Perfect fit
ARRI LMB-25	Compatible
ARRI LMB-15	Compatible
ARRI LMB-5	Compatible
ARRI LMB 6x6	Not compatible with 6x6 size
ARRI MB-18	Does not fully slot into place

ARRI MB-19	Does not fully slot into place
Vocas MB-436	Compatible
BT Strummer DNA	Does not fully slot into place
Panavision	Not compatible (filter thickness)
TLS	Not compatible (filter thickness)
Titla MB-T12	Compatible
Tilta MB-T04	Does not fully slot into place
Wooden Camera	TBA
Movcam	TBA
Redrock Micro	TBA
ARRI MMB-2	TBA
ARRI SMB-2	TBA
Chrosziel	TBA

POLARISING FILTER CALIBRATION The polarising filters are securely and permanently fixed into the filter trays and precisely matched and orientated during assembly or after a replacement/repair.

Calibration of the polarisers is not necessary and the built-in motor will automatically calibrate when connected to a power source.

cPRO SYSTEM

The Cinefade system is only compatible with the cmotion cPRO lens control system and not yet compatible with ARRI's WCU-4 or similar systems from Preston, Tilta, RT Motion etc. The cPRO system should be used independently for Cinefade control and it is possible to use another system for focus, zoom and camera control if desired but please do not mix and match components of the separate systems.

If using your own cPRO system, download the latest firmware at www.cinefade.com/knowledge.

1. Screw antenna on to cPRO hand unit and insert battery.
2. Screw antenna on to cPRO camin or cPRO motor and mount to camera.
3. Tightly attach iris motor to camera's rod support and engage with gears of iris ring on lens.
4. Attach focus motor (temporarily) and engage with gears of focus ring on lens.
5. Daisy chain the cPRO motor or cPRO camin with the VariND, focus motor, and power source (see illustration below).

NOTE The VariND will automatically calibrate and set to its position of maximum light transmission (ND0.4).

CABLE GUIDE

To From	LBUS (Le 4p/m)	RS (Fi 3p/m)	D-tap (Anton Bauer 2p)	CAM (7p/f)
CAM (7p/m)	0.5m-K2.0015760	0.3m-K2.0015754	0.5m-K2.0018813	0.3m-K2.0023823
LBUS (Le 4p/m)	0.2m-K2.0006749 0.3m-K2.0006750 0.5m-K2.0006751 0.8m-K2.0006752	0.8m - LPS-1	0.8m-K2.0006758	N/A
LBUS angled (Le 4p/m)	0.35m-K2.0013042 0.8m-K2.0013043 1.0m-K2.0013041	N/A	N/A	N/A

*Cables in bold are included in hire kit

POWER, CALIBRATION AND SETTINGS

1. Power ON hand unit [press HOME button] and set to preferred radio frequency (rf) channel.

MENU > Main > Radio > Channel > 0-13

2. Set cPRO motor/cPRO camin to same rf channel.

Short press Lower Button on motor or camin to toggle between rf channels.

3. Assign cPRO motor to iris.

MENU > Motors > Motor Settings > cPro motor > Axis > Iris

Or short press Upper Button on cPRO motor to toggle between focus, iris and zoom.

4. Assign second motor to focus (if available).

MENU > Motors > Motor Settings > cforce motor > Axis > Focus

Or short press button on cforce motor to toggle between focus, iris and zoom.

5. Set motor direction (from the camera operator's view the direction indicates the side of the camera the motor is attached to).

MENU > Motors > Motor Settings > [select motor] > Direction > left/right

6. Press Back Button to calibrate all motors or navigate to

MENU > Motors > Calibration all

7. Set Filter mode (For VariND and RotaPola mode skip to pages 33 and 39).

MENU > Filter > Filter Mode > Cinefade mode

SYSTEM SETTINGS	
Assign slider to iris control	<i>Menu > Controls > Slider > Control > Iris</i>
Assign knob to focus control	<i>Menu > Controls > Knob > Control > Focus</i>
Set slider limit to motor limit	<i>Menu > Controls > Slider > Limits > Motor limit</i>
Assign UB2 to 'Filter set'	<i>Menu > Buttons > UB2 > Filter Set</i>
Assign UB1 to VariND/polar increase	<i>Menu > Buttons > UB1 > Filter increase</i>
Assign UB3 to VariND/polar decrease	<i>Menu > Buttons > UB3 > Filter decrease</i>
Set iris motor ramp to max	<i>Menu > Motors > Motor Settings > cPro motor > Ramp > Max</i>
Turn on Optical Safe Range	<i>Menu > Filter > Optical safe range > On</i>

Iris motor ramp

The VariND and cPRO motor both have the same very fast motor speeds and since the VariND is slaved to the iris motor and reacts to its movement, it is advantageous to slow down the cPRO motor by setting a long ramp to ensure constant exposure during a Cinefade.

It is also possible to use the slightly slower cforce motor on the iris to ensure the VariND can always react fast enough and keep exposure constant.

Optical Safe range

With Optical Safe Range turned ON the system displays recommended limits for the VariND filter in Cinefade mode and limits the filter to ND1.9 in VariND mode. Optical imperfections, such as a slight colour cast and cross pattern may be introduced into the image when optical safe range is turned OFF.

LENS MAPPING

During the lens mapping process, each T-stop position on the lens is saved into the cPRO system. The data is used to calculate the exposure compensation required during Cinefade operation.

ACCURATE LENS MARKINGS A high degree of accuracy is required to achieve the best results. Every lens is slightly different and it is recommended that each lens set is mapped individually and tested during a prep day. Exposure fluctuations may be caused by inaccurate lens mapping and by inaccurate T-stop markings on the lens.

STEP 1

Enter lens Wizard to create new lens (calibrate if necessary)

MENU > Lens > Create

STEP 2

Check if motor direction is correct. Use UB1-3 to toggle between left/right

Right = Right side of camera from Camera Operator's POV

STEP 3

Select lens manufacturer

STEP 4

Enter lens name

Set - Select character
UB1 - Caps/numbers
UB2 - Delete letter
UB3 - Backspace

STEP 5

Enter Serial number

Set - Select character
UB1 - Letters/numbers
UB2 - Delete letter
UB3 - Backspace

STEP 6

Select focus scale of lens

Imperial or metric

STEP 7

Select 'Iris' to map iris scale

STEP 8

Move iris to largest T-number position (smallest iris diameter) with iris slider. Use thumbwheel to select equivalent iris value and press 'set'.

STEP 9

Repeat for every iris position, being as accurate as possible

UB3 - Change T-stop decimal value

UB2 - Delete a value

STEP 10

Press 'next'.

TIP If you are not able to select the correct iris value, the motor direction is set wrong. Exit the lens wizard temporarily (Press Home button) to change the motor direction.

MENU > Motors > Motor Settings > [select motor] > Direction > left/right

Navigate back to the lens wizard to continue with lens mapping.

MENU > Lens > create > next > next (continue with last open session)

STEP 11

Select Focus (imperial/metric).

STEP 12

Use knob to select focus mark and thumbwheel to select equivalent focus value and press 'set'.

STEP 13

Repeat for every focus mark (minimum of two marks required).

STEP 14

Press 'next'.

FOCUS MAPPING is not necessary for Cinefade operation but required to create a lens file and allows depth of field information to be displayed.

To save time, simply choose a minimum of two focus points and proceed to next step.

- Set focus point 1 (INF).
- Rotate knob to opposite end.
- Set focus point 2 (CF).
- Press 'next'

If you wish to control focus from a separate device, the focus motor may be removed after lens mapping is complete.

If there is **NO FOCUS MOTOR** connected you can temporarily re-assign the motor from iris to focus control before entering the lens wizard.

MENU > Motors > Motor Settings > [select motor] > Axis (Iris) > Focus

Enter all lens info (steps 1-6) and map the focus scale first (steps 11-14). Then re-assign the motor back to iris control by exiting the lens wizard (Press HOME button) and navigate to

MENU > Motors > Motor Settings > [select motor] > Axis (Focus) > Iris

Resume lens mapping by navigating to

MENU > Lens > Create > Next > Next (continue with last open session)

Click through steps 1-6 and complete Steps 7 to 10 to map the iris and continue with lens mapping process (see steps 15-19 below).

As a last step, it is important to load the lens you have just created after completing lens mapping without a focus motor.

STEP 15

Select Zoom

STEP 16

Select focal length with thumbwheel, press set.

UB3 - Change resolution

UB2 - Delete a value

STEP 17

Press Next

STEP 18

Press 'Save'

"Lens file saved successfully" will be displayed.

STEP 19

Press 'Next' to complete lens mapping.

Repeat lens mapping with every lens to be used for Cinefade.

LENS COMPATIBILITY Cinefade is compatible with any cine-lens that has a geared aperture ring and accurate T-stops markings. The edges of the VariND filter or matte box may become visible on certain extremely wide focal lengths and cause vignetting.

TIP It is possible to save up to 30 lens files on the cPRO hand unit. If there is no more free space available, delete lenses from the memory.

MENU > Lens > Delete > [select lens] > select > delete

If there are noticeable exposure fluctuations, this may be due to inaccurate lens mapping or inaccurate lens markings. Edit the iris scale of the lens file to make any necessary changes.

MENU > Lens > Edit > next/cal > [select lens] > next > [edit values]

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CINEFADE OPERATION

LOAD LENS

After a lens is mapped, it is automatically loaded. To load a different lens from the saved lenses on the cPRO hand unit navigate to

Menu > Lens > Load > [Select Lens] > select

NOTE Check that the displayed iris value on the hand unit corresponds to the iris position on the lens. If it does not, make sure the motor is correctly calibrated and the direction is set correctly.

MENU > Motors > Calibration All

Change motor direction if necessary. From the camera operator's view the direction indicates the side of the camera the motor is attached to.

MENU > Motor > Motor Settings > Direction > [left/right]

ACTIVATE CINEFADE MODE

With the VariND at position of maximum light transmission (ND0.4), the iris slider is used to set exposure and depth of field as usual. **Once exposure is set, that iris value becomes the position of greatest depth of field.** As soon as the Cinefade is activated the iris motor and VariND are slaved to each other and the iris slider no longer controls exposure but depth of field only. The lens is opened up from this start position, gradually decreasing depth of field while the VariND filter automatically keeps exposure constant. Slide the iris slider in the opposite direction to close down the lens and gradually increase depth of field.

1. Use iris slider to set exposure (and position of greatest depth of field). This is the start position.
2. Activate Cinefade by pressing assigned User button (UB2).
3. Use iris slider to open up the lens and decrease depth of field at constant exposure. Reverse the slider movement to close down the lens and increase depth of field at constant exposure.
4. To exit Cinefade mode and regain control over exposure, press the assigned User button (UB2) again.

The VariND will automatically rotate back to ND0.4.

EXPOSURE CONTROL If light conditions change or if you want to adjust the Cinefade range, quickly and easily change the start position with User buttons 1 and 3 while Cinefade is activated.

UB1 changes the iris start position by +1/3 T-stop. The Cinefade range shifts and the image will become darker by 1/3 stop as the ND value increases. Move the iris slider to the new start position to see the new depth of field setting.

UB3 changes the iris start position by -1/3 T-stop. The Cinefade range shifts but the current iris value remains the same. Move the iris slider to the new start position to see the new depth of field and exposure setting.

User buttons are not active in Cinefade mode when Cinefade is deactivated.

SET IRIS LIMITS

When closing down the lens past the Cinefade start position, the VariND is at its position of maximum light transmission (ND0.4) and the exposure will become darker. To avoid this, set iris limits, which limit the iris scale to a user defined range.

1. Activate Cinefade mode or move iris slider to start position.
2. Press and hold the assigned menu button (MB1).
3. Slide iris slider to open up lens to desired position of smallest depth of field.
4. Release the assigned menu button (MB1).
5. Iris slider is now limited to values between the two points.

MOTOR LIMIT VS CONTROL LIMIT There are three different ways of limiting the travel of the iris slider and the rotation of the iris motor.

MENU > Controls > Slider > Limits > [Motor Limits]

Motor Limit - The recommended setting for Cinefade operation allows the entire iris slider to be used to control the whole Cinefade range. The iris motor does however jump whenever the iris limits are set or deleted.

Motor and Control Limit - The iris motor does not jump in this setting, making it useful if changes to the iris limits need to be made while recording.

Control Limit - The whole Cinefade range can be controlled with a small movement of the iris slider, eg. for extremely fast Cinefade transitions. The iris motor does however jump whenever the iris limits are set or deleted.

CINEFADE INFORMATION DISPLAY

Swipe through the different displays to reach the Cinefade information display.

MAIN - FIZ - CINEFADE - BUTTONS - CONTROLS

STEALTH MODE

Stealth mode allows the illumination of the User buttons and OLED display on the VariND to be turned off to avoid any distractions or unwanted reflections. To turn Stealth mode on for all connected LBUS devices navigate to

MENU > Main > Stealth mode all > On

TIPS AND TRICKS

When operating Cinefade it is recommended to 'prime' the motor to get rid of any initial exposure fluctuations caused by motor backlash and the gap between motor and gear. Before recording the Cinefade, move the iris motor by a small fraction so the motor and gear can properly engage.

You may prefer to use the knob to control the Cinefade (if focus is being controlled by another hand unit), as it allows a smoother transition and more control. Use the mechanical end stops to limit the Cinefade range. A 'panic button' on the knob allows these mechanical limits to be temporarily overridden.

MENU > Controls > Knob > Control > Iris

EXAMPLE CINEFADE CALCULATION

In this example the DP has set the camera to ISO 800 at a shutter speed of $1/48^{\text{th}}$ second and metered the scene at $T11\frac{1}{2}$. They are using a Leica Summilux-C 29mm T1.4 lens.

They wish to perform a 5-stop Cinefade from T11 to T2. The VariND filter requires an exposure compensation of $1\frac{1}{2}$ stops, so the DP decides to increase the sensor's sensitivity to ISO 1600 to achieve a light meter reading of $T16\frac{1}{2}$, allowing the iris to be set to T11 for a good overall exposure.

Once the iris slider is set to T11 and they are happy with the exposure, they press UB2 on the hand unit to activate Cinefade mode. T11 becomes the start value.

To limit the iris slider to a range between T11 and T2, they push and hold MB2 on the hand unit, sliding the iris slider from the start position at T11 until the lens is at T2 before releasing MB2.

If 'motor limits' are set the entire iris slider can now be used to gradually fade between T2 to T11 and vice versa at constant exposure.

If the light conditions change, the DP can change camera settings, lighting or they can change the Cinefade range to adapt to the lighting environment. Deactivating Cinefade mode to change exposure settings or simply using UB1 to decrease exposure and UB3 to increase exposure also affects the Cinefade start position.

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VariND MODE

VariND MODE SETUP

In VariND mode it is possible to control the VariND filter separately without having it slaved to the iris motor and use it as a practical tool to control neutral density values between ND0.4 and ND2.5 whenever the camera is inaccessible or to use it for dynamic ND control, for example during INT to EXT transition shots.

1. Screw antenna on to cPRO hand unit and insert battery.
2. Screw antenna on to camin and mount to camera or directly to Motorised Polariser via the ARRI Accessory mount and camin bracket.
3. Daisy chain VariND with camin and power source (see illustration below).

NOTE VariND will automatically calibrate and set to position of maximum light transmission (ND0.4). The position of minimum light transmission is at ND2.5.

4. Set Filter mode to VariND mode (for RotaPola mode skip to page 39).

MENU > Filter > Filter Mode > VariND mode

SYSTEM SETTINGS	
Assign thumbwheel to Filter control:	<i>Menu > Controls > thumbwheel > Control > Filter</i>
Assign UB1 to VariND increase	<i>Menu > Buttons > UB1 > Filter increase</i>
Assign UB3 to VariND decrease	<i>Menu > Buttons > UB3 > Filter decrease</i>
Turn on Optical Safe Range	<i>Menu > Filter > Optical Safe Range > On</i>

Optical Safe range

With Optical Safe Range turned ON the system displays recommended limits for the VariND filter in Cinefade mode and limits the VariND to a maximum value of ND1.9 in VariND mode. Optical imperfections, such as a slight colour cast and cross pattern may be introduced into the image.

Remote VariND control

Using the cPRO hand unit you are able to remotely adjust the ND value. User buttons UB1 and UB3 increase or decrease the neutral density by a third of a stop. Press and hold to speed through the steps.

This is especially useful whenever the camera is inaccessible, like for example on a crane and dramatically speeds up ND changes for the Camera Assistant, as well as allowing a higher degree of accuracy in exposure control.

Dynamic VariND control

To dynamically adjust the ND value for a smooth transition, use the thumbwheel to increase and decrease ND values on the fly. It is also possible to assign VariND control to any other controller (knob, slider, joystick).

This is especially useful for smooth ND transitions, for example on an INT to EXT Steadicam shot when the DP wants to maintain a constant depth of field.

The movement of the VariND motor is translated in a linear fashion when assigned to joystick control to allow changes at constant speed.

The current ND value is displayed on the hand unit display (use touchscreen to swipe between different information displays) and on the OLED screen of the Motorised Filter.

Direct VariND control

ND values can also be adjusted directly on the VariND filter by using the two buttons on the Motorised Polariser to increase and decrease ND values in steps of a third of a stop. This direct control works with or without the wireless cPRO lens control system.

Simply connect the VariND to a power source via the LBUS cable to make it work as a standalone variable ND filter.

Press both buttons on the VariND filter at the same time to enter the 'Filter Mode Selection Menu' and use the upper and lower buttons to toggle through and select VariND mode. After 3 seconds the selection is applied. The current ND value is displayed on the OLED screen.

This option is especially useful for fast and precise ND changes, saving the Camera Assistant time on set and does not require a cPRO system, only a LBUS power cable.

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ROTAPOLA MODE

ROTAPOLA MODE SETUP

By separating the Motorised Polariser from the Static Polariser, it no longer acts as a VariND filter but as a simple Motorised Polariser that can be remotely controlled whenever the camera is inaccessible and rotated through 180°. This is especially useful for example when the camera is mounted on a Russian Arm for automotive shoots to remotely control car reflections from the hand unit.

1. Insert only Motorised Polariser into matte box.
2. Screw antenna on to cPRO hand unit and insert battery.
3. Screw antenna on to camin and mount to camera or directly to Motorised Polariser via the ARRI Accessory mount and camin clamp.
4. Daisy chain Motorised Polariser with the camin and power source (see illustration below).
5. Set Filter mode

MENU > Filter > Filter Mode > RotaPola mode

NOTE Filters will automatically calibrate and set to 0° polarisation angle. The maximum rotation of the polariser is 180°.

SYSTEM SETTINGS

Assign thumbwheel or joystick to Filter control	<i>Menu > Controls > thumbwheel/ joystick > Control > Filter</i>
Assign UB1 to RotaPola angle increase	<i>Menu > Buttons > UB1 > Filter increase</i>
Assign UB3 to RotaPola angle decrease	<i>Menu > Buttons > UB3 > Filter decrease</i>

Remote RotaPola control

Using the cPRO hand unit you are able to remotely adjust the polarisation angle. User buttons UB1 and UB3 increase or decrease the polarisation angle in 5 degree steps. (Press and hold the buttons to speed through the steps).

This is especially useful whenever the camera is inaccessible, like for example on a crane and dramatically speeds up polarisation angle changes for the Camera Assistant, as well as allowing exact repeatability and a higher degree of accuracy.

Dynamic RotaPola control

To dynamically adjust the polarisation angle, use the thumbwheel to smoothly increase and decrease the angle on the fly. It is also possible to assign RotaPola control to any other controller (knob, slider, joystick).

This is especially useful to dial in very precise polarisation angles or for unique effects, such as animating changes in polarisation effects, like for example animating reflections on cars (example footage: www.cinefade.com/rotapola).

The movement of the RotaPola motor is translated one-to-one when assigned to thumbwheel control and in a linear fashion when assigned to joystick control to allow changes at constant speed.

The current polarisation angle is displayed on the hand unit display (use touchscreen to swipe between different information displays) and on the OLED screen of the Motorised Polariser.

Direct RotaPola control

The polarisation angle can also be adjusted directly on the Motorised Polariser by using the two soft buttons to increase and decrease polarisation angle in 5 degree steps. This function works with or without the wireless cPRO lens control system.

Simply connect the Motorised Polariser to a power source via the LBUS cable to make it work as a standalone RotaPola.

Press both User buttons on the Motorised Polariser at the same time to enter the 'Filter Mode Selection Menu' and use the upper and lower buttons to toggle through and select RotaPola mode. After 3 seconds the selection is applied. The current polarisation angle is displayed on the OLED screen.

This is especially useful for fast RotaPola changes, saving the Camera Assistant time on set and does not require a cPRO system, only a LBUS power cable.

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TROUBLESHOOTING

“Have you tried turning it off and on again?”

- The IT crowd

Seriously though, if there are any issues, please try turning off the hand unit and disconnecting the motors and filter from any power source before reconnecting and turning the system back on again. If the issue persists, below are some common solutions and contact details for further support.

CHECKLIST

- ✓ Lens loaded.
- ✓ Motor direction (left/right) set correctly.
- ✓ Motorised Polariser and Static Polariser are orientated correctly for Cinefade and VariND mode (see page 15).
- ✓ Motors and rods are attached tightly and motors are engaged with lens gear.
- ✓ All motors are calibrated.
- ✓ Correct filter mode selected (Cinefade, VariND, or RotaPola mode).
- ✓ System settings are set correctly (see page 21).

FIRMWARE UPDATE

Make sure the cPRO motor, cPRO camin, cPRO hand unit and Cinefade VariND are running the latest firmware version, available at www.cinefade.com/knowledge.

1. Load the firmware file (.cmf) onto a USB stick.
2. Insert USB stick into USB port on hand unit.
3. Navigate to

MENU > About > Firmware update > cPRO hand unit/LBUS devices > [select firmware file] > select > update

LED STATUS DESCRIPTION IRIS SLIDER	
Off	No axis assigned to slider / slider illumination off
Solid white	Motor ready, no warnings / slider illumination on
Solid green	Motor ready, no warnings, limits set
Green/yellow flashing	Calibration request
Yellow flashing	Motor calibration
Solid yellow	Calibration time out
Solid red	No motor connected
Red flashing	Slider locked / no motor control

VIGNETTING

Optical shading which looks like vignetting may occur on some fast, wide prime lenses. This phenomenon should not be confused with vignetting caused by a matte box or filter, which only occurs on extremely wide lenses.

Polarising filters develop a cross-pattern at high cross-polarisation angles, which may become visible on wide focal lengths first as a vignetting effect in the corners and as an actual cross pattern on extremely wide lenses.

EXPOSURE FLUCTUATIONS

Imprecise T-stop markings on the iris ring or inaccurate lens mapping may cause the exposure to vary slightly during a Cinefade. Using a T-stop bench to create the most accurate lens files is recommended, especially for vintage lenses.

The VariND and cPRO motor both have the same very fast motor speeds and since the VariND is slaved to the iris motor and reacts to its movement, it is advantageous to slow down the cPRO motor by setting the maximum motor ramp to ensure a constant exposure.

MENU > Motors > Motor Settings > cPro motor > Ramp > Max

It is also possible to use the slightly slower cforce motor on the iris to ensure the VariND can always react fast enough and keep exposure constant.

EXPOSURE DROP

If you notice the image gradually becoming darker, this may be because the current iris position is outside of the Cinefade range and the VariND is at maximum light transmission. If, for example, the Cinefade start position is set at T11, the exposure will become darker at higher T-stops and stay constant at lower T-stops.

Often there is a noticeable drop in exposure towards the wide-open end of the lens and it is recommended to edit the affected lens to change the wide-open iris value. If for example the indicated fastest T-stop of the lens is marked as T1.3, change this to a T1.5 in the lens wizard to see if there is a noticeable improvement. Experiment with different values until the exposure does not drop anymore.

MENU > Lens > Edit > next/cal > [select lens] > next > [edit values]

There may be a small drop in exposure whenever the end of the Cinefade range is reached and the direction of the Cinefade is reversed. The iris motor rotates in the opposite direction and may experience backlash caused by the gap between the motor gear and lens gear or within the motor itself. It is recommended to 'prime' the move before recording the Cinefade to get past the small exposure drop.

If you are not using an LMB matte box and have placed the Motorised Polariser and Static Polariser into separate filter slots the alignment may be off, especially if one of the slots is individually rotatable.

To do a rough alignment, with the RotaPola at 90 degree rotation, find the position of minimum light transmission by rotating the rotatable stage and fix it in that position.

Although very unlikely, it is possible that the glass filters themselves have moved and are misaligned, in which case the unit would need to be sent in for alignment and repair.

RADIO FREQUENCY ISSUES

The maximum range is between 700m-1,000m (line of sight) depending on region settings.

Change the radio channel frequency to find a free one if there is interference from other radio devices nearby and make sure that the cPRO hand unit is on the same rf channel as the cPRO motor and cPRO camin (see page 19).

INCORRECT IRIS VALUES

If the iris values displayed on the hand unit do not correspond with the markings on the lens you may have the wrong lens loaded or may need to change the motor direction.

MENU > Motors > Motor Settings > [select motor] > Direction > left/right

POLARISATION ISSUES

The Rotating Polariser must be positioned closest to the lens to avoid changes in polarisation effects, such as changes in reflections or blue skies.

To reduce polarised glare when using the VariND to improve images of the sky, water surfaces and when shooting through windows, rotate both polarisers together to retain their position relative to each other by rotating the entire clip-on matte box.

VARIABLE ND ISSUES

The VariND consists of two circular polarising filters, which must be orientated correctly to achieve cross-polarisation and a variable neutral density. If they are orientated differently the filters will act as a warm-to-cool colour filter without any changes in light transmission.

The Motorised Polariser has a laser engraved marking indicating the direction that should be facing towards the camera and the Static Polariser has a marking indicating the direction that should be facing outwards to the subject.

FILTERS DON'T FIT INTO MATTE BOX

Check matte box compatibility on page 16 and make sure that the filters are not being obstructed by the tray catcher so they can be inserted fully and centred.

OLED SCREEN IS OFF

If the OLED screen on the Motorised Polariser is off and the buttons are not lighting up, Stealth mode may be turned on. The screen and buttons will light up for three seconds when one of the buttons is pressed. Alternatively, turn off Stealth mode.

MENU > Main > Stealth mode all > Off

LENS MAPPING ISSUES

If you are not able to select the correct iris value, the motor direction is set incorrectly. Exit the lens wizard temporarily (Press Home button) to change the motor direction.

MENU > Motors > Motor Settings > [select motor] > Direction > left/right

If you do not have a second motor to assign to focus for lens mapping, you can temporarily re-assign the motor from iris to focus control before entering the lens wizard, map the focus scale and then change back the motor to iris control to complete the iris and zoom mapping (see page 24).

Alternatively, it is possible to complete a lens mapping, without mapping the entire iris scale (only one value is required), re-assign the focus motor to iris and edit the lens to map the entire iris scale.

It is possible to save up to 30 lens files on the cPRO hand unit. If there is no more free space available, delete lenses from the memory.

MENU > Lens > Delete > [select lens] > select > delete

POWER

Make sure the motors and filter are getting enough power. When powering multiple devices (monitor, motors, CineTape etc.) from one battery, the voltage may drop and cause issues.

ANALOGUE FILM CAMERA VIEWFINDER

Using the VariND filters with some film camera's viewfinders and video taps may cause a gradual darkening of the image seen through the viewfinder but does not affect the recorded image on the film plane.

VISIBLE COLOUR CAST

The VariND does not cause any visible changes in colour cast during the Cinefade effect. Beyond ND1.9 a slight colour cast is introduced into the image, which is only visible on a vectorscope.

If there is a visible change in colour cast, please ensure that the Motorised Polariser and Static Polariser are orientated correctly by using the laser engraved markings 'This Side out' and 'This side to camera'.

Using a vectorscope at magnification, it is possible to notice a small trace into the red/yellow area.

ERRATIC MOTOR MOVEMENT

The iris motor may jump when setting or deleting iris limits. To avoid this set the iris slider to 'motor and control limit' (page 30).

If the filter motor moves erratically or uncontrollably, unplug any LBUS cables from the Motorised Polariser and reconnect. If the problem persists, make sure the most recent firmware is installed or contact support (contact details on page 49).

The filter motor may be a little jumpy after setting limits or a small part of the iris slider scale is limited to the entire lens motor.

EXPOSURE

Due to the nature of the effect, a large amount of light is required to achieve a 5-stop Cinefade. Most exterior daytime environments are ideal. Interior or studio shoots require a lot of artificial light and/or very light sensitive cameras.

LENS FLARES, REFLECTIONS & OPTICAL IMPERFECTIONS

Dust, dirt or scratches on the rotating glass filter may become visible as they travel through the image. Clean the filters with a lens cleaning cloth and cleaning solutions to remove any surface dirt or dust. To replace a scratched glass filter, please contact support (contact details on page 49).

Light shining directly into the VariND filters can cause unwanted double reflections. Use a tiltable matte box to get rid of these reflections.

Please help us improve Cinefade by reporting any bugs or issues you encounter and we truly welcome any suggestions you may have about new features you'd like to see on future software and hardware updates.

CONTACT

For all questions, comments or concerns please contact Cinefade Limited in the UK.

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To keep up to date with Cinefade please feel free to follow @cinefade on social media or sign up to our newsletter by emailing us.

A digital version of the manual is available at www.cinefade.com/manual

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