



# THE LINK - MANUAL

# THE LINK

The Link system allows you to move the camera intuitively in real-time with your body movements. No complex configuration is required and there is no need to practice, like you would with traditional RC devices. The stabilizer just points where you want it to point - it all works with your arms movement. Without any control barriers only your creativity is the limit of what you can achieve. This is the future of camera control.

The Link is basically an RC receiver module but thanks to some advanced electronics it can also serve as a transmitter. You can pair one of The Links with any piece of gear you can think of and control the other Link attached to your stabiliser - possibilities are endless! For even more awesomeness The Link features various advanced functions that will come in handy on different occasions.

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## DISCLAIMER

All information and instructions in this document are subject to change without notice.

This is a sophisticated kinetic control product. It must be operated with caution and common sense and requires some basic mechanical knowledge. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property. This Manual contains instructions for safety operation. It is essential to read the entire Manual and follow all instructions and warnings in the manual, prior to setup or use, in order to operate ACR The Link correctly and avoid damage or injury.

ACR Systems has made every effort to provide clear and accurate information in this Manual, which is provided solely for the user's information. While thought to be accurate, the information in this document is provided strictly "as is" and ACR Systems will not be held responsible for issues arising from typographical errors or user's interpretation of the language used herein that is different from that intended by ACR Systems. All safety and general information is subject to change as a result of changes in applicable laws.

ACR Systems reserves the right to revise this Manual and make changes from time to time in the content hereof without obligation to notify any person of such revisions or changes. In no event shall ACR Systems, its employees or authorized agents be liable to you for any damages or losses, direct or indirect, arising from the use of any technical or operational information contained in this document.

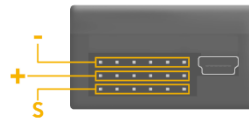
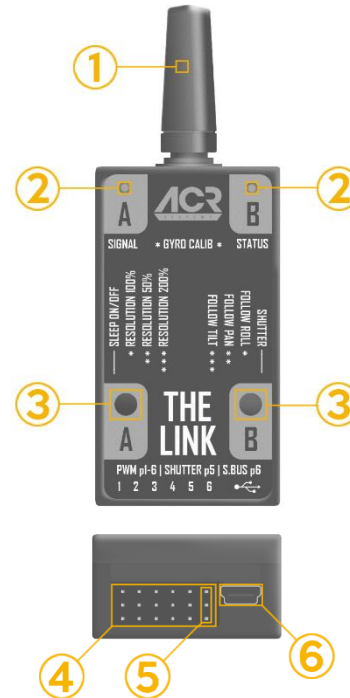
## REAL-LIFE USAGE

As we have already cleared that up, the technology is rather simple in practical use. Whenever there is need for standard Remote Control solutions for a gimbal, The Link can make its entry. Here's just a few of the things it can be used for:

- UAV / aerial filming & photography,
- remote work with cranes, JIB arms,
- using goggles, such as FatShark or Oculus Rift with The Link on them to get the POV gimbal control according to your head movements,
- controlling the gimbal while moving in a vehicle: the operator is safely framing the shots on the backseat while the gimbal carrier is another person in the car or the gimbal is attached to the outside of the vehicle,
- controlling one gimbal with another gimbal (twin Links).

## ELEMENTS OF THE LINK

1. Short range antenna.
2. 3-color LEDs (for checking range, connection status, current mode).
3. 2 buttons (for setting up different modes and simple configuration).
4. 6x PWM 3-pin sockets (6 separate channel connection).
  - a. “-” – GROUND
  - b. “+” – VOLTAGE
  - c. “S” – SIGNAL
5. S.BUS 3-pin socket (single cable multichannel connection).
6. Mini-USB (firmware change, service purposes).



## DOUBLE THE LINK PACKAGE COMPONENTS

The Double The Link package includes:

- ACR The Link core unit configured as host
- ACR The Link core unit configured as client
- 2x short range antenna
- 4x short servo cable 3-to-3
- 2x long servo cable 3-to-3
- 2x short mini-USB cable
- 2x two-sided adhesive tape
- 2x carbon booms with polymer grips
- carbon central boom
- 10x 25mm boom blocks
- 4mm carbon centerpiece with monitor mount
- 2mm carbon centerpiece with The Link and accessories mount
- 2x top part central boom to grip boom carbon piece
- 2x bottom part central boom to grip boom carbon piece
- 16x 35mm M3 screws (for grip connectors)
- 4x 40mm M3 screws (for centerpiece)
- 20x M3 rivernut
- 2x 300mm velcro strap
- 2x 120mm velcro with adhesive
- photo screw

## COMPATIBILITY

Our system is compatible with every gimbal that can receive a PWM or SBUS signal. The current list of compatible stabilizers is as follows:

- ACR The Plus (previously BeSteady ONE Plus)
- BeSteady ONE
- ACR The Beast (previously BeSteady FOUR)
- FreeFly MoVI M5 – *future feature*
- FreeFly MoVI M10 (both versions) – *future feature*
- FreeFly MoVI M15 – *future feature*
- DJI Ronin
- DJI Ronin M
- BaseCam SBGC based gimbal with 8-bit or 32-bit CPU, with or without encoders, that has got S.BUS or PWM sockets

If you are concerned whether your gimbal is compatible with The Link, check your User Manual if your device is equipped with PWM or SBUS connectivity, If your gimbal is based on SBGC / AlexMos technology you only need to have the remote socket on your main board and a few moments of configuration.



## MOUNTING ACR THE LINK HANDHELD

With Double The Link comes ACR The Link Handheld which has place to attach ACR The Link, power bank and even external monitor.

Before you start using it you should assemble it first. To do that take following steps:

- Prepare main carbon rod, two carbon rods with grips and provided hex key.
- Insert both grip tubes into boom locks and adjust their position to your needs.
- Tighten screws on both sides.

## MOUNTING THE LINK

### HOST

Take The Link and the short antenna out of the box. Attach the short antenna to The Link.

The easiest way to use The Link host unit is to attach it to The Link Handheld which is included in Double The Link package. You can mount it directly to any other device you may want to use.

The Link host unit needs to be powered from a 5V power source such as a power bank, which can be connected via the USB port.

Power The Link host unit and access the menu. While there select the defaults for the gimbal you want to work with.

## CLIENT

Take The Link and the short antenna out of the box. Attach the short antenna to The Link.

Remember that gimbal performance with The Link may vary on current firmware and settings.

Gimbal must be turned off before connecting the link!

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## CONNECTING TO DJI RONIN

The Link works with DJI Ronin gimbals. To do that you should take the following steps:

- Plug one side of long servo cable 3-to-3 to DJI Ronin D.Bus socket – brown cable to the top.
- Plug other side of this cable to The Link client unit to the pin 6 (S.Bus) – brown cable to the top.
- Attach The Link client unit under the DJI Ronin camera mount. The Link antenna should always point to the left side of the gimbal.
- Turn on DJI Ronin and in DJI Assistant and in CONTROL menu set following options.
- In The Link client menu choose DJI Ronin profile.

1. DJI Ronin D.Bus connection
2. The Link on DJI Ronin camera shelf position



	Maximum Speed		Deadband		Smoothing	
	Pan	Tilt	Pan	Tilt	Pan	Tilt
Thumb Controller	15	15	0	0	0	0
Remote Operator	100	100	0	0	0	0

Endpoint		
Pan Axis	0	0
Tilt Axis	45	90

Pan/Tilt Remote Speed Adjustments	Independent		
	Pan	Tilt	Roll
Fast	100	100	100
Normal	100	100	100
Slow	100	100	100

Channels		
CH 0	Normal	Pan
CH 1	Normal	Tilt
CH 2	Normal	
CH 3	Normal	Roll
CH 4	REV	
CH 5	REV	
CH 6	Normal	
CH 7	Normal	

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## CONNECTING TO ACR THE BEAST

To connect ACR The Link with ACR The Beast you should take the following steps:

- Plug one end of both short servo cables 3-to-3 to The Beast REMOTE socket – brown cables to the bottom.
- Plug other side of those cables to The Link as follow:
  - Bottom cable connect vertically on pin 1 – brown cable to the top.
  - Top cable connect horizontally on bottom pins 2, 3 ,4 starting from brown cable.
- Attach The Link client unit to vertical arm of ACR The Beast.
- Turn on The Beast and toggle ON The Link in CONTROL -> ADVANCED.
- For best performance in CONTROL menu set as follow
  - Expo rate – 0%
  - Deadband – 3%
  - Filter – 6,2%
  - Roll/Tilt/Pan speed – 100%
- In The Link client menu choose The Beast profile.



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## CONNECTING TO OTHER BASECAM SBGC BASED GIMBAL – PWM

To connect The Link with BaseCam SBGC based gimbal with PWM you should take the following steps:

- Plug one end of both short servo cables 3-to-3 to your gimbal signal socket.
- Plug other side of those cables to ACR The Link as follow:
  - Bottom cable connect vertically on pin 1 – brown cable to the top.
  - Top cable connect horizontally on bottom pins 2, 3 ,4 starting from brown cable.
- Attach The Link client unit to vertical arm of BaseCam SBGC based gimbal.
- Turn on the gimbal.
- In The Link client menu choose BaseCam SBGC defaults.
- In ACR Manager select The Link in Default RCU, in other BaseCam SBGC select as follow:
  - ROLL -> RC\_ROLL – PWM
  - PITCH -> FC\_PITCH – PWM
  - YAW -> FC\_ROLL – PWM



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## CONNECTING TO OTHER BASECAM SBGC BASED GIMBAL – S.BUS

To connect The Link with BaseCam SBGC based gimbal with S.BUS you should take the following steps:

- Plug one end short servo cable 3-to-3 to your gimbal signal socket so it will correspond with GROUND, VOLTAGE and SIGNAL on The Link
- Plug other side of this cable to The Link client unit to the pin 6 (S.Bus) – brown cable to the top.
- Attach The Link client unit to vertical arm of BaseCam SBGC based gimbal.
- Turn on the gimbal.
- In The Link client menu choose BaseCam SBGC S.BUS defaults.
- BaseCam SBGC select as follow:
  - ROLL -> RC\_VIRT\_CH\_1
  - PITCH -> RC\_VIRT\_CH\_2
  - YAW -> RC\_VIRT\_CH\_3

## SETTING THE LINK

Each operation on The Link will be confirmed by number of corresponding LED flashes equal number of clicks.

### REGULAR OPERATION (NOT IN MENU)

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#### BUTTON A

long click	Sleep Mode ON/OFF
one short click	Resolution 100%
two short clicks	Resolution 50%
three short clicks	Resolution 200%
long click + button B	Enter Menu

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#### BUTTON B

long click	Shutter action
one short click	Remote Follow Mode – roll axis ON/OFF
two short clicks	Remote Follow Mode – pan axis ON/OFF
three short clicks	Remote Follow Mode – tilt axis ON/OFF
long click + button A	Enter Menu

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DIODE A

●●●●●●●●	Weak radio signal
●●●●●●●●	Moderate radio signal
●●●●●●●●	Strong radio signal
○●○●○●○●○●○●	Not connected
○●○●○●○●○●○●	Connecting
●●●●●●●●	Currently in Menu

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DIODE B

●●○●○●○●○●	Danger / error
●○●○●○●○●○	No Remote Follow Mode engaged / Sleep Mode
●○●○●○●○●○	Remote Follow Mode – all axis engaged
●○●○●○●○●○	Remote Follow Mode – roll and tilt axis engaged
●○●○●○●○●○	Remote Follow Mode – tilt and pan axis engaged
●○●○●○●○●○	Remote Follow Mode – only tilt axis engaged
●○●○●○●○●○	Remote Follow Mode – only roll axis engaged
●○●○●○●○●○	Remote Follow Mode – only pan axis engaged
●●●●●●●●	Currently in Menu

## IN MENU

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### BUTTON A

long click	Restore factory defaults
one short click	Client mode – this option will automatically pair to first visible host
five short clicks	Host mode
long click + button B	Enter Menu

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### BUTTON B

one short click	DJI Ronin profile
two short clicks	The Beast profile
four short clicks	SBGC PWM profile
five short clicks	SBGC S.Bus profile
long click + button A	Enter Menu
long click + 1 short button A	Enable “Roll activated sleep mode”
long click + 2 short button A	Disable “Roll activated sleep mode”

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### DIODE A AND DIODE B



Currently in Menu

## DIFFERENT VISIBLE SIGNALS

### DIODE A



Service Mode initiated

### DIODE A+B



diodeA ● diodeB ●

Both alternately ●

Gyro calibrating in progress

Writing on Mass Storage

Currently flashing firmware

## SPECIAL ACTIONS

long click button B + USB

one short click buttons A+B

roll angle above 60

Enter Service Mode

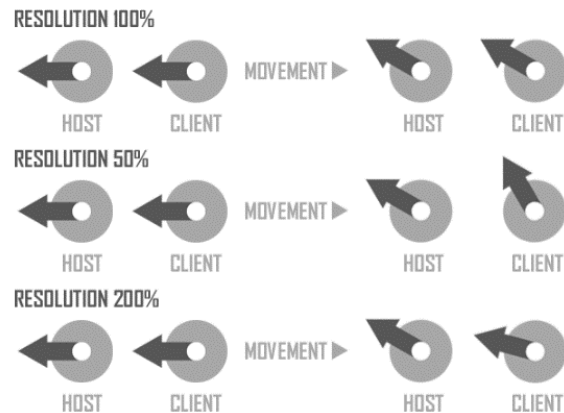
Gyro calibration – The Link must not be moved during calibration

Activate sleep mode

## RESOLUTION

Resolution scales movement data sent for The Link to your gimbal. You may configure different “Resolution Scales” for all axis.

- 100% Resolution will give you 1:1 type of a rotation.
- 50% Resolution will give you 2:1 type of a rotation.
- 200% Resolution will give you 1:2 type of a rotation - you will be much more precise. In this situation you will be able to be more accurate with narrow focal lengths, as your full 360 degree rotation is equal to half-turn 180 degree on gimbal.



You may choose between 50%, 100%, and 200% setting on The Link.

## FIRMWARE UPDATE

Always be sure that you have the latest firmware version. Latest firmware is available at <http://acr-sys.com/support/#software>.

Remember that you always need to update both client and host units.

To update The Link firmware you need to take following steps:

- Connect USB cable to your PC.
- Hold down B button on The Link you want to update.
- Plug USB cable in The Link.
- Mass Storage will open on your PC.
- Copy “link.hex” file to Mass Storage.
- After file is copied unplug USB cable.
- Power The Link and the update process will start (LED A and LED B flashing red) – it will take about 120 seconds.

## KNOWN ISSUES AND LIMITATIONS

- Remember to calibrate the gyro on The Link and your gimbal frequently to decrease pan axis drift.
- During fast movement the gimbal may lose its orientation to The Link. In that case you should activate sleep mode, reposition The Link and deactivate sleep mode.
- The Link work may be limited by your gimbal internal limits.
  - DJI Ronin speed
    - Roll -> 90°/3,6s
    - Tilt -> 90°/1,25s
    - Pan -> 90°/1,25s
  - The Beast speed
    - Roll -> 90°/1,4s
    - Tilt -> 90°/1s
    - Pan -> 90°/1s
- While working with DJI Ronin, after fast movement the gimbal may lose orientation and start low frequency oscillation. In that case you should activate sleep mode, reposition The Link and deactivate sleep mode.



- If DJI Ronin starts oscillating on Pan axis after fast move you might need to increase Pan Axis Stiffness in DJI Assistant.
- Always double check DJI Assistant settings. With different then proposed settings, DJI Ronin might not work properly.
- If you experienced sudden sleep mode activation, disable “Roll activated sleep mode”.
- The Beast should be updated with firmware version at least 1.8 b 362. Latest firmware is available at <http://acr-sys.com/support/#software>.
- If you want to switch The Beast in Inverted Mode, remember that you need to turn OFF The Link in CONTROL menu while in Underslung and then turn ON after switching to Inverted Mode.

*If you still have problems with setting up  
The Link with your gimbal, please contact  
our support ([support@acr-sys.com](mailto:support@acr-sys.com))*