Document Number: 9200380
Revision: 2v1

Kinesys Elevation Rigger

Operating Manual
[ORIGINAL]

A range of hand-held hoist controllers

TAIT accepts no liability for any consequences resulting from inappropriate, negligent, or incorrect use of the equipment.

The contents of this manual are believed to be correct at the time of printing. In a commitment to a policy of continuous development and improvement, TAIT reserves the right to change the specification of the product or its performance, or the contents of this manual, without notice.

Contact details

support@taittowers.com
www.taittowers.com/products
Tel: +44(0) 20 8481 9850

UK address

TAIT
Unit 2 Kempton Gate Business Centre
Oldfield Road
Hampton
Middlesex
TW12 2AF

US address

TAIT
401 W Lincoln Ave
Lititz
PA 17543

Contents

1. List of Figures

2. Introduction

2.1 Product description

The Kinesys Elevation Rigger is a range of hand-held controllers designed specifically for operation with the Kinesys Elevation range of chain hoists and other products, and offers a simple way to control chain hoists of either a fixed or variable speed.

The Rigger is available in 8, 16 and 24 channel versions. The simplicity and rugged construction ensures the units can be operated safely and with a minimal amount of training.

2.2 Scope and purpose

This manual describes the key features, means of operation and maintenance operations of the Rigger.

The equipment described in this manual may only be operated by personnel qualified to do so. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with this and associated equipment.

2.3 Support requests

For technical support on this product, please use the following contact details:

support@taittowers.com
Tel: +44(0) 20 8481 9850

To resolve your support request as quickly as possible, please provide the following information, if available, when contacting Kinesys:

- Site name, address, machine location details and your contact details.
- As much detail as possible on the behaviour observed, including any unusual changes in behaviour that are different from normal operation and any environmental conditions that may be a factor (e.g. fluctuations in temperature and water damage).
- Details on the behaviour that should have been expected.
- The exact steps required that produce the issue.
- Any solutions to fix the issue that you have already tried.
- Any workarounds that you have found.
- Equipment item numbers and serial numbers, such as those displayed on the identification plates/labels.
- Version numbers of any software being used.
- Any screen shots, photographs or videos of the issue.

3. Safety information

The following symbols are used to indicate specific items which require special attention by the user:

	**Warning: Instructions which relate to safety**
	**Warning: Instructions which relate to safety where there is a particular risk of electric shock**
	**Warning: Instructions which relate to safety where there is a particular overhead risk**
	**Danger: Prohibited actions which are forbidden under all circumstances**
	**Additional important information**

3.1 Safety regulations

The following regulations serve as the basis for assembly, installation, certification and maintenance of automation equipment within the area of the European community. For countries other than those mentioned, local legislation and directives may apply in addition to or in place of the European regulations as stated in this manual.

The manufacturer's guarantee depends on the consideration of these regulations and the operating instructions.

European regulations

2006/42/EC	EC - Machinery Directive
2014/30/EU	EC - Directive relating to electromagnetic compatibility
2014/35/EU	EC - Electrical equipment designed for use within certain voltage limits

BGV accident prevention regulations (Germany only)

DGUV Vorschrift 3 (BGV A1)	Principles of accident prevention
DGUV Vorschrift 3 (BGV A3)	Electrical facilities and equipment
DGUV Vorschrift 52 (BGV D6)	Accident prevention regulation for use in crane systems
DGUV Vorschrift 54 (BGV D8)	Accident prevention regulation for electric winches, lifting and pulling equipment
DGUV Regel 100-500 (BGR 500)	Hoisting accessories
DGUV Grundsatz 309-001 (BGG 905)	Principles for crane inspections

Harmonized regulations	
EN 17206	Machinery for stages and other production areas; Safety requirements and inspections
EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 14492-2	Cranes - Power driven winches and hoists
EN 818-7	Short link chain for lifting purposes; Fine tolerance hoist chain, Grade T
EN ISO 13849-1 & 2 / BS EN 62061	Safety of machinery - Safety-related parts of control systems; General principles for design
EN 60034-1	Rotating electrical machines; Rating and performance
EN 60034-5	Rotating electrical machines; Degrees of protection provided by the integral design of rotating electrical machines
EN 60204-1	Electrical equipment of machines, General requirements
EN 60204-32	Electrical equipment of machines; Requirements for hoisting machines
EN 60529	Degrees of protection provided by enclosures (IP-Code)
EN 60947-1	Low-voltage switchgear and control gear
EN 61000-6-2	Electromagnetic compatibility; Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility; Emission standard for industrial environments
EN 82079-1	Preparation of instructions for use - Structuring, content and presentation

Regulations and technical specifications	
FEM 9.511:1986	Rules for the design of series lifting equipment; Classification of mechanisms
FEM 9.683:1995	Series lifting equipment; Selection of hoisting and travelling motors
FEM 9.751:1998	Series lifting equipment; Power driven series hoist mechanisms; Safety
FEM 9.755:1993	Serial hoist units; Measures for achieving safe working periods

3.2 Safety warnings

IF IN DOUBT ABOUT ANY ASPECT OF MOVING OBJECTS, ALWAYS SEEK PROFESSIONAL ADVICE BEFORE OPERATION.

Make sure this Operating Manual is always kept in a complete and fully readable condition and that it is always accessible to all operators of the equipment.

Prohibitions of operation

- **Do not install the Rigger or do maintenance to the Rigger in an area that is accessible to children or other unqualified persons.**
- **Do not use the Rigger in an aggressive environment. An aggressive environment is defined as an environment which contains hazardous substances that may degrade the load bearing capacity of the lifting equipment.**
- **Do not use the Rigger if it does not appear to be in 100% working order.**
- **Do not modify or attempt to repair the Rigger in any way unless instruted to do so by the manufacturer.**

Safety precautions before operation

- **Do a full risk assessment of the location where the Rigger and its connected devices are intended to be used.**
- **Do not start movement operations until a qualified person has inspected the Rigger and all other connected equipment, and confirmed that is in 100% working order.**
- **Software-independent means of stopping movement must be provided, including a hardware emergency stop system that is compliant with all local regulations.**
- **Make sure all machine stop buttons, emergency stop buttons and enabling switches in the system have been tested and are functioning correctly.**
- **Make sure all operators know the locations of the machine stop buttons, emergency stop buttons and enabling switches in the system.**
- **Make sure all attached loads are unobstructed and will not come into contact with other static or moving objects during movement.**
- **Make sure all attached loads are always visible to the operator where possible. If this is not possible, make sure the operator has reliable communication with a person who can clearly see the attached loads.**
- **Make sure all persons in the hazard zone underneath the lifting equipment are aware of the potential for movement.**

Safety instructions during operation

- **If you notice any unexpected or dangerous movement during operation, press the E-Stop button on the top panel of the Rigger or The E-Stop button on the venue-wide safety controller to bring all movement to an immediate stop. Note that not all stop buttons in the system necessarily stop the movement an individual lifting device. Alternatively, if an enabling switch (hold to run) is being used in the system, then release the enabling switch.**
- **If an enabling switch is used in your system to initiate movement of the connected lifting device, be aware that releasing it may cause movement to stop unexpectedly.**
- **After a stop button has been pressed, the reason for its actuation must be found, and all possible failures in the system removed by trained personnel. The stop button must then be reset before continuing operation. Note that the stop button reset procedure may be different for different devices - refer to individual product manuals for more details.**

Safety instructions during maintenance

- **Maintenance and repairs to the Rigger must only be carried out be competent and trained personnel**
- **Always disconnect the power and remove the load when carrying out maintenance procedures.**
- **Make sure the maintenance area is secure before carrying out maintenance work.**

3.3 Visible damages

If any damage or breakages are detected during operation or during tests, do not operate the Rigger until it has been repaired and a qualified person has checked and approved it.

3.4 Spare parts

Only original fixing components, spare parts, and accessories listed in manufacturer's spare parts catalogue are acceptable for use. The manufacturer's guarantee is given for those spare parts only. The manufacturer cannot be held responsible for any damages due to the use of non-original parts or accessories.

3.5 Handling and storage

Condensation

The Rigger is designed for indoor use only. If the product has been exposed to temperature fluctuations, for example during transport, there may be risk of condensation which may result in damage. Do not connect the Rigger to a power source immediately. Leave the unit disconnected until it has reached a safe temperature.

Shocks

Do not shake, knock or drop the Rigger. Avoid excessive force when installing and operating the product.

Handling

Do not lift the Rigger by any of its cables or connectors as this may cause damage to the unit and/or cables.

Packaging

Where possible, use the original packaging to transport the Rigger or a purpose-built flight case.

4. Product overview

4.1 Front panel overview

Note: Rigger 8 user interface shown; Rigger 16 and Rigger 24 are similar but with 16 and 24 of each direction indicator, status indicator and channel switch respectively. The Rigger 16 and Rigger 24 also have additional protection handles.

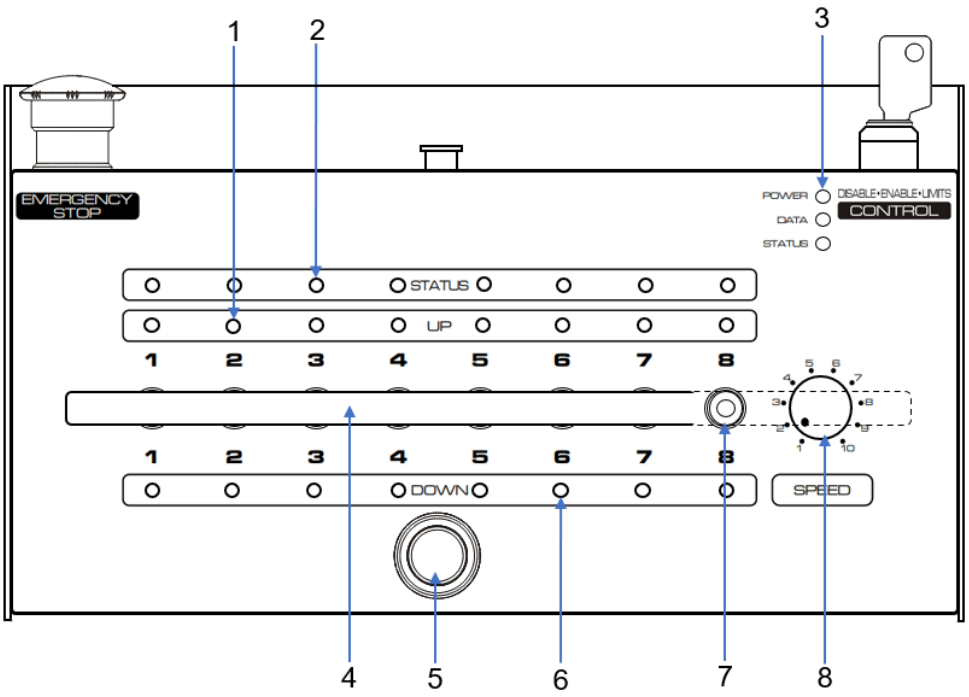

Figure 1. Front panel overview

Item #	Description	Notes
1	Up direction indicators	Shows whether a channel has been selected to run up and whether there is a fault on that channel; see section 4.4 for details.
2	Channel status indicators	Shows the current state of each channel and its associated Elevation Drive; see section 4.5 for details.
3	Unit indicators	Provides feedback on the current state of the controller; see section 4.3 for details.
4	Protection handle	Provides protection to the switches and prevents them being selected accidentally.
5	GO button (enabling switch)	Press and hold this button to begin movement of the selected channels.
6	Down direction indicators	Shows whether a channel has been selected to run down and whether there is a fault on that channel; see section 4.4 for details.
7	Channel switches	Can be moved up or down to set the desired direction of movement. The default central position is the OFF position.
8	Speed control dial	Used to set the running speed of all channels at a value between zero and the maximum speed as defined by the DIP switch configuration.

4.2 Top panel connections

Note: Rigger 8 shown, Rigger 16 and Rigger 24 similar.

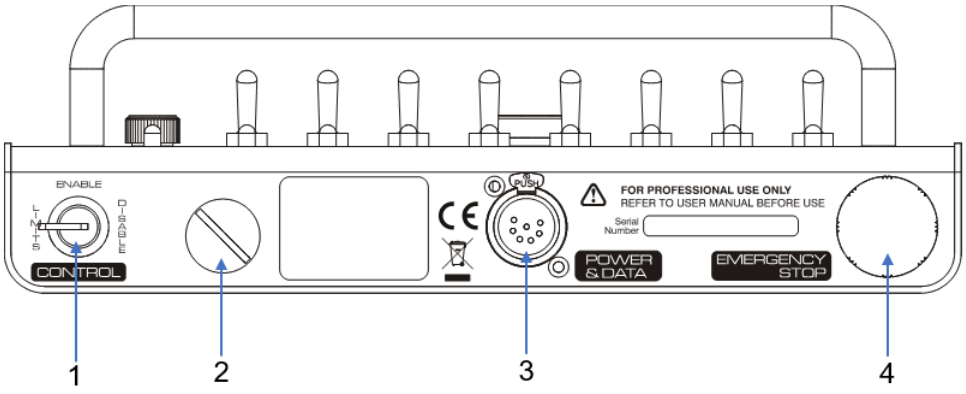

Figure 2. Top panel connections

Item #	Description	Notes
1	Control key switch	Selects between unit disabled, unit enabled and software limits bypass enabled
2	DIP switches	Remove the cover to access the DIP switches and allow the unit to be configured for the chain hoists being controlled.
3	Power/Data In and Control Out	Data, supply voltage, emergency stop and remote enable are supplied and controlled through this connection.
4	Emergency Stop (E-Stop) button	Brings all movement of the selected channels to a complete stop when pressed.

4.3 Unit indicators

The unit indicators are the three LEDs at the top right of the front panel.

4.3.1 Power indicator

The power indicator is controlled by the microprocessor inside the unit. It will stay illuminated when power is being received and the microprocessor is running correctly.

4.3.2 Data indicator

The data indicator displays any faults detected in the communications with the connected Elevation Drive. Under normal operating conditions the indicator will stay illuminated to show that it has good communications.

The indicator will turn OFF if the Rigger is not getting a response from the Elevation Drive it detected during its initial scan of addresses.

For example, if four drives were detected initially and one is removed from the system, the indicator will be ON for 75% of the time and OFF for 25% of the time. If two controllers are removed, it will be ON for 50% of the time and OFF for the other 50%, and so on.

When used in conjunction with the channel status indicators, the data indicator provides an easy way to detect communication faults in the system.

4.3.3 Unit status indicators

The status indicator shows the current state of the Rigger and can illuminate in one of three colours: red, yellow, or green. Under normal operation, the indicator will stay solid and when the limits are bypassed it will flash.

Red - an E-Stop button has been pressed, either on the Rigger itself or somewhere else in the system. No movement is possible in this state until the E-Stop has been reset. All connected units will also show faults in their respective numbered indicators.

Yellow - the E-Stop button has been released but the enable key switch is in the ‘DISABLE’ position. The connected devices are in standby and cannot be moved as their hardware enable line is not present.

Green - the E-Stop button has been released and the enable key switch is set to the ‘ENABLE’ position. The Rigger is now ready to initiate movement of the connected devices.

4.4 Channel Up/Down indicators

Each channel has a channel up and channel down indicator. A green indicator is used for up and red is used for down. The up/down indicators can be in one of three states: off, on or fast flash.

OFF - movement in this direction is not selected.

ON - movement in this direction has been selected. The status indicator must also be ON when the GO button is pressed to begin movement.

Fast flash - the Elevation Drive connected to this channel has issued a warning to state that movement in this direction is prohibited.

4.5 Channel status indicators

The channel status indicators are the row of indicators above the Up indicators on the front panel. Each channel has a status indicator associated with it, which displays whether an Elevation Drive is present on that channel and, if so, the current state of that drive.

The channel status indicator can be in one of four states: off, on, slow flash and fast flash.

OFF - no drive has been found on this channel. In standard addressing mode, this means the specific address that relates to this channel could not be found. In auto addressing mode, it means that all the active drives have already been found and are located on channel numbers lower than this one.

ON - the hoist associated with that channel is on standby and ready for movement.

Slow flash - the GO button has been pressed and the hoist associated with that channel is currently moving.

Fast flash - there is either a fault with the Elevation Drive or the Rigger cannot communicate with the drive. Channels with a fast flashing status indicator cannot be moved when the direction switches are moved to the Up or Down positions. No movement will be allowed on any other channels until either the faulty channel has been switched to the OFF position or the fault has been rectified.

5. Operation

The Rigger is designed with ease of operation as a priority.

The Rigger connects directly to the Elevation Drive via a single data/power connection on the top panel. The unit draws all its power from the Elevation Drive and as such does not require an external power supply.

The Rigger communicates with the Elevation Drive using the same protocol as Kinesys Vector software. Therefore, where large numbers of hoists are being used it may be preferable to set up the units in Vector before setting up the Rigger for operation.

Each Elevation Drive has upper and lower software limits built in. By setting these appropriately, the Rigger can be used to move connected chain hoists between the exact upper and lower positions with full speed control. The following sections regarding the operation of Rigger assume that the Elevation Drives have been configured correctly.

5.1 Powering on

The Rigger will power on as soon as it receives power from the Elevation Drive via the power/data cable connection on the top panel of the unit.

Depending on the DIP switch settings the unit may display the version number of the software on the status indicators before starting the self-test and scanning operations.

5.1.1 Self-test mode

When the Rigger is powered on and the key switch is in the ENABLE position, the self-test will initiate by illuminating all the indicators on channel 1, then channel 2 and so on up to the highest channel (8, 16, or 24 depending on the variant). This action also confirms whether all indicators are working correctly.

When the Rigger is powered on and the key switch is in the LIMITS position, the self-test mode will start after the software version number is displayed in the format shown in section 5.1.3. Any channel switch not in the OFF (middle) position will illuminate either the Up or Down indicator to show that the system is communicating with the switch correctly. Turning the speed control dial will illuminate the status indicators and pressing the GO button will illuminate the opposing Up or Down indicator. The unit will exit this mode once all channels are in the OFF position.

5.1.2 Scanning mode

Once self-test mode is complete, the Rigger then scans for Elevation Drives connected to the network. This can take a few milliseconds in standard addressing mode or up to 5 seconds when the controller is set to automatic addressing. During this procedure, the power indicator will flash.

Once the address scan is complete, the Rigger is ready for operation. All channels that have been successfully located will have illuminated status indicators.

5.1.3 Displaying the firmware version

When the Rigger is powered on with the key switch is in the LIMITS position, the firmware version number will be shown on the controller indicators. The status indicators show the major version number, the Up indicator shows the minor version number and the Down indicator shows the revision number.

For example, version 1.4.1 would be indicated by:

- Status indicator = 1
- Up indicator = 4
- Down indicator = 1

In units with firmware versions earlier than 1.5.0, DIP switch 6 must be turned ON to display the version number.

5.2 Movement of chain hoists

Use the channel switches to set each channel to Up, OFF (central position), or Down. Any channels showing faults must have their channel switches set to OFF as this will prevent movement of all other channels if not done.

For variable-speed chain hoists, set the speed control dial to an appropriate speed and press and hold the GO button to begin movement. The selected chain hoists will then accelerate until the chosen speed is reached. The speed can also be changed mid-movement if required.

The numbers around the edge of the speed dial are not units of measurement but represent arbitary equal values between the minimum and maximum speed of the chain hoist. These can be set using the DIP switches.

Fixed speed chain hoists will move immediately when the GO button is pressed without the need to change the speed control dial.

As the hoists reach their software limits they will stop automatically unless the key switch is held in the LIMITS position. To stop the movement before the hoists reach their limits, simply release the GO button. Fixed speed hoists will stop immediately and variable speed hoists will decelerate to a stop using the ramp rate set by the Elevation Drive.

If any selected channels develop a fault while moving, all connected hoists will be stopped. To begin movement again, the fault must be cleared or the channel with the fault must be deselected by moving the channel switch to the OFF position.

6. DIP switch settings

To access the eight DIP switches, unscrew and remove the blanking plug from the rear of the controller. Through the hole, the switches are numbered one to eight from left to right. The switches are OFF in the down position and ON in the up position.

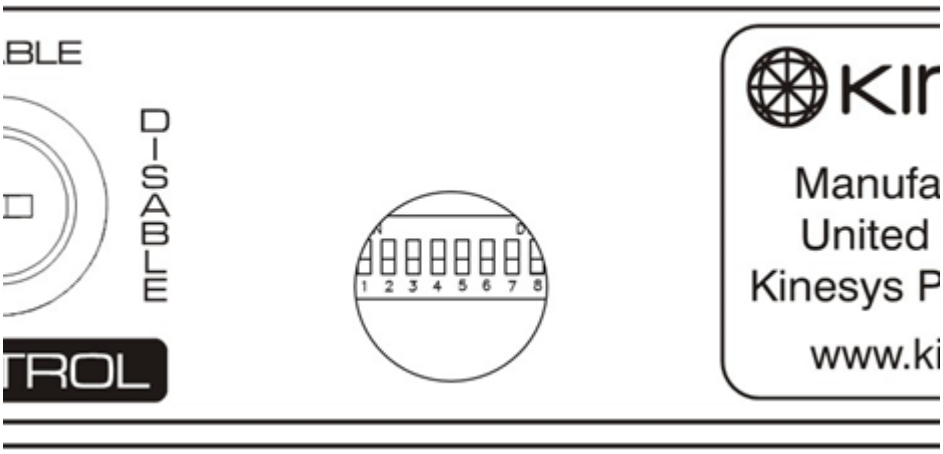

Figure 3. DIP switches

The functions of DIP switch combinations are given in the table below.

DIP switch	Position	Function
1	OFF	Standard addressing
	ON	Auto addressing
2 and 3	OFF - OFF	Addresses 1 - 8
	ON - OFF	Addresses 9 - 16
	OFF - ON	Addresses 17 - 24
	ON - ON	Addresses 25 - 32
4 and 5	OFF - OFF	Maximum speed = 100 mm/s
	ON - OFF	Maximum speed = 200 mm/s
	OFF - ON	Maximum speed = 400 mm/s
	ON - ON	Maximum speed = 800 mm/s
6 and 7	OFF - OFF	Acceleration / deceleration ramp rate = 100 mm/s^2
	ON - OFF	Acceleration / deceleration ramp rate = 200 mm/s^2
	OFF - ON	Acceleration / deceleration ramp rate = 400 mm/s^2
	ON - ON	Acceleration / deceleration ramp rate = 800 mm/s^2
8	OFF	Operating mode
	ON	Programming mode

The DIP switch settings above apply to firmware versions 1.5.0 and later. Settings for earlier firmware versions are given in section 6.5.

6.1 Addressing modes

Two addressing modes are available: Standard and Auto.

6.1.1 Standard addressing

Standard addressing mode assigns addresses to channels sequentially, starting with channel 1 and ending with last channel (8, 16 or 24 depending on the variant). The starting address determined by the configuration of DIP switches 2 and 3.

6.1.2 Auto addressing

Auto addressing mode scans all the available addresses from 1 to 999 and assigns them to channels on a first found, first assigned basis. In Auto addressing mode the scanning process occurs after powering up and can take up to 5 seconds before operation can begin.

In Auto addressing mode, make sure all connected Elevation Drives are powered on before powering on the Rigger. If one or more drives are not powered on, then hoists may be auto-assigned in an unexpected order.

6.2 Setting the maximum speed

The Rigger is able to control a variety of chain hoists at the same time. As each chain hoist model may have a different maximum speed, sending the speed signal as a percentage from 0 to 100% may result in hoists running at different speeds. The maximum speed for all connected hoists is therefore set by the Rigger as a value in mm/s. This is set using DIP switches 4 and 5.

For firmware versions earlier than 1.5.0, the maximum speed settings are 100, 200, 300 and 400 mm/s. This has been changed in later versions to allow for a wider range of speeds.

6.3 Setting the ramp rate

DIP switches 6 and 7 are used to set the ramp rate (acceleration/deceleration). For most cases, a ramp rate of 100 mm/s^2 is adequate but this can be increased for faster motors if necessary.

For firmware versions earlier than 1.5.0, the ramp rate is fixed at 100 mm/s^2 and cannot be adjusted.

6.4 Programming mode

In the event that the Rigger requires a firmware upgrade, move DIP switch 8 to the ON position to enter Programming mode. At all other times, this switch should be left in the OFF position.

6.5 Legacy DIP switch settings

The following table applies to firmware versions 1.0.X - 1.4.X.

DIP switch	Position	Function
1	OFF	Standard addressing
	ON	Auto addressing
2 and 3	OFF - OFF	Addresses 1 - 8
	ON - OFF	Addresses 9 - 16
	OFF - ON	Addresses 17 - 24
	ON - ON	Addresses 25 - 32
4 and 5	OFF - OFF	Maximum speed = 100 mm/s
	ON - OFF	Maximum speed = 200 mm/s
	OFF - ON	Maximum speed = 300 mm/s
	ON - ON	Maximum speed = 400 mm/s
6	OFF	Bypass firmware version number display on power up
	ON	Show firmware version number display on power up
7	OFF	8 channel unit
	ON	16 channel unit
8	OFF	Operating mode
	ON	Programming mode

7. Product specifications

Feature	Specification
Mains in	Power and data received via XLR7 cable connected to Kinesys Elevation Drive or Kinesys Array 485
Enclosure	2 / 16.6 mm Aluminium, RAL5011 stove enameled and silk screened
Environmental	IP40 (Protected from tools and small wires greater than 1 mm)
Operating temperature	0ºC - 55ºC (32ºF- 131ºF)
Storage temperature	-20ºC to 80ºC (-4ºF to 175ºF)
Dimensions	Rigger 8: 284 mm x 170 mm x 86 mm (11.2 in x 6.7 in x 3.4 in) Rigger 16: 284 mm x 254 mm x 86 mm (11.2 in x 10.0 in x 3.4 in) Rigger 24: 284 mm x 338 mm x 86 mm (11.2 in x 13.3 in x 3.4 in)
Weight	Rigger 8: 1.4 kg (3.1 lbs) Rigger 16: 2.1 kg (4.6 lbs) Rigger 24: 2.8 kg (6.2 lbs)
Accessories provided	PowerCON True1 2 m power cable, socket to bare ends

8. Service & End of Life

In the event of a product being considered beyond economic repair it should be disposed of with care and in line with local legislation on disposal of Waste Electrical and Electronic Equipment (WEEE).

In Europe WEEE shall be disposed of in accordance with European Union Directive 2012/19/EU.

In most regions of the world, similar legislation exists to ensure that WEEE is handled separately to maximise reuse of materials and avoidance of landfill.

9. Declaration of Conformity

ORIGINAL

EC Declaration of Conformity

Manufacturer:	Kinesys Projects Limited
of the address:	Unit 2 Kempton Gate, Oldfield Road, Hampton, Middlesex, TW12 2AF, UK
in accordance with the following EC directives:	**Low Voltage Directive 2014/35/EU** **EMC Directive 2014/30/EU**
declares that the products:	**Kinesys Elevation Rigger 8** **Kinesys Elevation Rigger 16** **Kinesys Elevation Rigger 24**

are in conformity with the applicable requirements of the following harmonised standards:

EN 61000-6-1:2007	**Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light industrial environments**
EN 61000-6-3:2007	**Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light industrial environments**

The manufacturer hereby declares that the products named above have been designed to comply with the relevant sections of the above referenced standards. The units comply with all applicable essential requirements of the directives.

In the EU the party authorised to compile the technical file is:
TAIT Netherlands B.V.
Weesperplein 4a, 1018 XA Amsterdam, The Netherlands
In the UK the party authorised to compile the technical file is:
Kinesys Projects Ltd.
Unit 2 Kempton Gate, Oldfield Road, Hampton,
Middlesex, TW12 2AF, UK

Equipment referred to in this Declaration of Conformity was first manufactured in 2003.

D Weatherhead
Managing Director
Hampton, November 2024

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request and are also contained in the product manuals.

Kinesys Projects Ltd.
TAIT Technologies UK Ltd.
Unit 5 Langthwaite Road, Langthwaite Grange Ind Estate, South Kirkby, Pontefract, West Yorkshire, UK, WF9 3AP
Registered in England and Wales No. 02962782 +44 2082 086000 taittowers.com