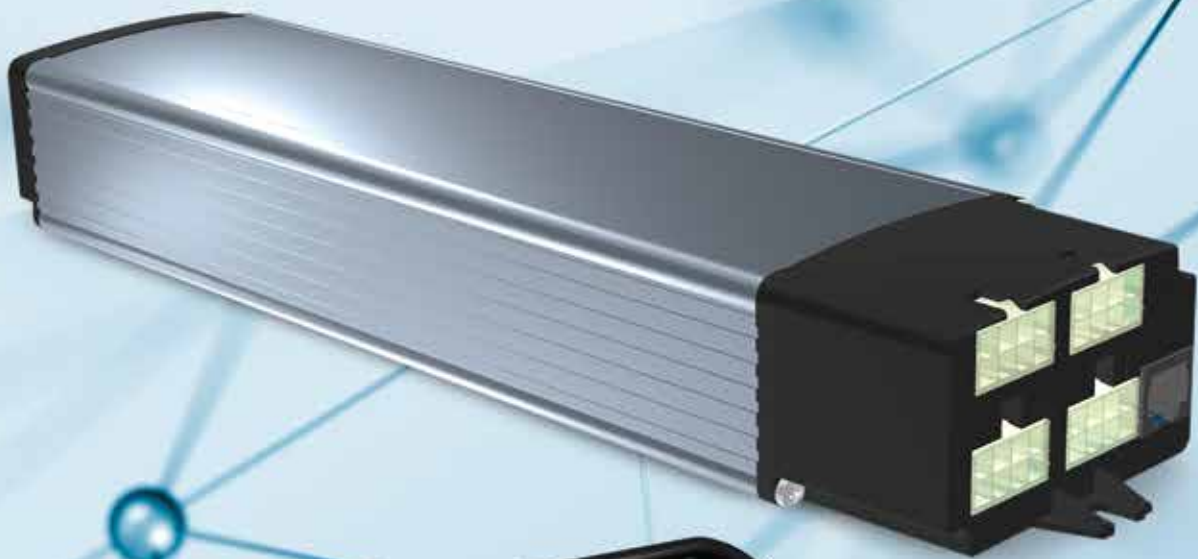




LAING INNOTECH

LAING CONTROLLER – THE UNIVERSAL CONTROLLER SERIES

from low-cost table applications to high-end
industrial applications with up to 24 drives





New development

The Laing LTC series controllers are a completely new development using the latest design topologies and components. The aluminum housing insures efficient heat dissipation and enables the controller to run continuously in most applications.



Communicative

Whether BLE, WiFi, the Cloud or ModBus, all communication channels can be used.



Configuration

Powerful software tools allow easy configuration, monitoring and maintenance of the controllers.



Easy synchronization

Simply plug two controllers into the control unit and they are synchronized.



Smartphone

Our Apps offer a whole variety of functions to the user.



LAING INNOTECH

CONTENT

Laing Controller	4
Laing Table Controller ranges	6
Control panels	12
Collision detection	18
Communication	20
Additional functions	24
Apps and tools	28

LAINING CONTROLLER – THE UNIVERSAL CONTROLLER SERIES

Same operating elements and the same operating philosophy for all versions

Same software tools and configuration files for all versions

1 to 4 motor outputs per controller for all versions

230 VAC EU version and 115 VAC US version

Battery version with controller-integrated rechargeable battery

24 V DC version

Controller-integrated high-sensitivity collision detection sensor

Occupancy detection via collision sensor

Acoustic feedback to the operator via tone sequences

Cascading of standard controllers through the control panel

Cascading of up to 6 controllers and definition of up to 4 groups via the HUB

BLE based wireless control panels

Controller-integrated BLE or WiFi

Integration into higher-level controls via standard ModBus

Remote maintenance and configuration via the cloud interface

Apps for control via smart phone

Safety stop and safety connection option for contact bars and light curtains



LTC range

all motor outputs are synchronized
(desktop applications)

With their compact design, the Laing controllers are considerably smaller than comparable controllers. An aluminum housing, for heat dissipation of the power electronics, allows higher powers over a longer period of time. The controllers have an internal expansion port for BLE and WiFi. All external connection options remain accessible.

The ModBus based communication allows for an easy integration into higher-level controls. The controller-integrated long-term test allows the performance of long term tests without the need to connect any external device. The acoustic feedback via the driven motors allows for a reliable configuration, even if only a two-button control panel is connected to the controller.

Easy to use and powerful configuration software allows the controller to be quickly adapted to individual requirements. Even customers can make changes, if they have been authorized for, very easily. The open architecture and the BLE-, WiFi- and ModBus-interfaces in the controller enable configuration and troubleshooting through the Internet. In almost all cases this can substitute personal visits to the customer's site.

LAINING TABLE CONTROLLER RANGES (LTC)

The LTC series is optimized for applications where all motors must operate synchronously - like in table applications. The motors and a control panel are connected to the controller, and when the control panel is actuated, all motors are controlled in a way so that they move synchronously.

The controllers offer numerous setting options to the user, such as 4 memory positions, upper and lower container stop, collision detection and occupancy detection. The controllers can be supplied with an integrated BLE- or WiFi-module. This allows for an easy and cost-effective integration of the controller into facility management systems, or communication with a smartphone or PC.

LTC

Controller for 1 to 4 drives
230 VAC or 115 VAC version

LTCB

Controller for 1 to 4 drives
With 86 Wh battery

LTCD

Controller for 1 to 4 drives
24 VDC to 32 VDC



All versions of the **LTC series** are also available as **LMC series**.

In the **LTC series**, all motor outputs are operated synchronously, i.e. all drives are controlled in such a way that they have the same position at all times.

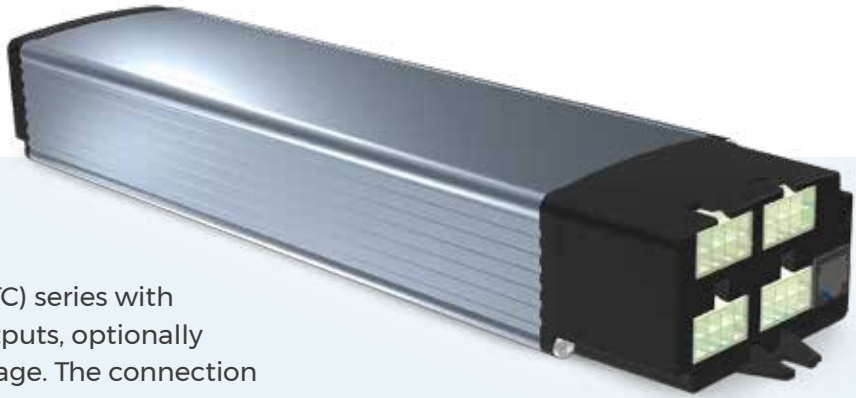
With the **LMC series**, all motor outputs can perform independent movements. For this purpose, they will be controlled via the HUB with several control panels or via ModBus. Of course, some or even all of the outputs can also be synchronized via the HUB.

Technical data and information about the LMC series can be found on our homepage:

www.Laing-Controller.com

LTC range

Laing Desktop Controller (LTC) series with 2 to 4 synchronous drive outputs, optionally for 230 V or 115 V mains voltage. The connection is made via a mains cable.

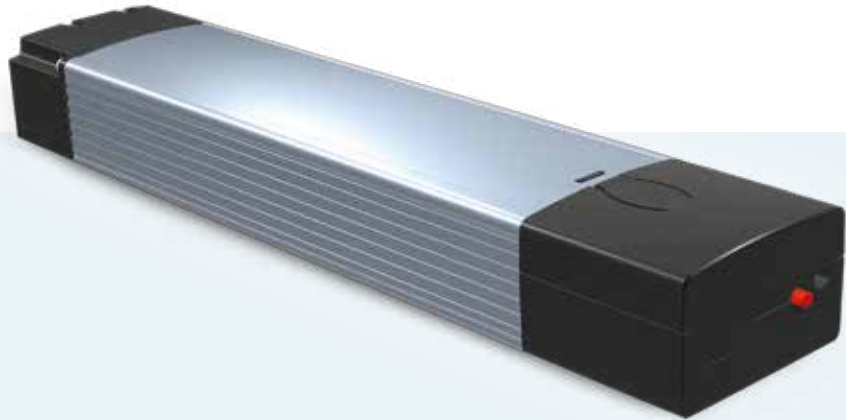


TECHNICAL DATA & TYPE OVERVIEW

LTC range mains operation			
TYPE	LTC 302EU	LTC 383EU	LTC 384EU
Max. power	300 W	380 W	380 W
Supply voltage	230 V 50/60 Hz	230 V 50/60 Hz	230 V 50/60 Hz
Supply current	1,5 A	2,0 A	2,0 A
Supply frequency	50-60 Hz	50-60 Hz	50-60 Hz
Output voltage	24 V	24 V	24 V
Total output current	15 A	19 A	19 A
Motor channels	2	3	4
Max. current per channel	12 A	12 A	12 A
Continuous duty up to	100 W total load	100 W total load	100 W total load
Standby power	250 mW	250 mW	250 mW
Synchronization	through bus	through bus	through bus
Size	38,5 x 62 x 265 mm	38,5 x 62 x 265 mm	38,5 x 62 x 265 mm

LTC range mains operation			
TYPE	LTC 302US	LTC 383US	LTC 384US
Max. power	300 W	380 W	380 W
Supply voltage	115 V 50/60 Hz	115 V 50/60 Hz	115 V 50/60 Hz
Supply current	3,0 A	4,0 A	4,0 A
Supply frequency	50-60 Hz	50-60 Hz	50-60 Hz
Output voltage	24 V	24 V	24 V
Total output current	15 A	19 A	19 A
Motor channels	2	3	4
Max. current per channel	12 A	12 A	12 A
Continuous duty up to	100 W total load	100 W total load	100 W total load
Standby power	250 mW	250 mW	250 mW
Synchronization	through bus	through bus	through bus
Size	38,5 x 62 x 265 mm	38,5 x 62 x 265 mm	38,5 x 62 x 265 mm

LTCB range Battery



In the **LTCB series**, the switching power supply is replaced by an 86 Wh accumulator. The controller is only slightly longer than the LTC series. The mounting points are identical for all series. The controller is mounted, connected and configured in the same way as the standard controller with power supply.

The battery pack is inserted at the end where the mains plug is plugged in for the LTC series. The capacity of the accumulators is generously dimensioned, as a rule operation over several months is possible.

The **battery pack** can be changed easily. The battery pack can be charged inside or outside the controller. The external charging option ensures that there is always a charged battery pack in the controller.

4 LEDs on the battery pack indicate – after pressing the red button – the current state of charge. Charging takes place via a world voltage plug-in power supply unit.

TECHNICAL DATA & TYPE OVERVIEW

LTCB range battery			
TYPE	LTCB 302	LTCB 383	LTCB 384
Max. power	300 W	380 W	380 W
Input	internal accumulator	internal accumulator	internal accumulator
Output voltage	24 V	24 V	24 V
Total output current	15 A	19 A	19 A
Motor channels	2	3	4
Max. current per channel	12 A	12 A	12 A
Continuous duty up to	100 W total load	100 W total load	100 W total load
Standby power	250 mW	250 mW	250 mW
Synchronization	through bus	through bus	through bus
Size	38,5 x 62 x 303 mm	38,5 x 62 x 303 mm	38,5 x 62 x 303 mm

LTCB range Battery

The battery pack can be changed easily, the battery pack can be charged inside the controller or outside the controller.



LTCD range

Direct current



The **LTCD series** is designed for connection to 24 V - 32 V DC power sources.

For applications where the power supply unit or the DC supply for the controller is only to be switched on when required, the controller has a 5 V input in addition to the input for the DC voltage. If this is supplied

with 5 V, the controller outputs 5 V at one output as soon as a movement is requested via the control unit. The 24 V - 32 V supply can then be switched on. After completion of the movement, the signal drops out again and switches off the supply.

TECHNICAL DATA & TYPE OVERVIEW

LTCD range direct current			
TYPE	LTCD 302	LTCD 383	LTCD 384
Max. power	300 W	380 W	380 W
Supply voltage	24 V - 32 V	24 V - 32 V	24 V - 32 V
Supply current	12 A - 16 A	15 A - 20 A	15 A - 20 A
Supply frequency	DC	DC	DC
output voltage	24 V	24 V	24 V
Total output current	15 A	19 A	19 A
Motor channels	2	3	4
Max. current per channel	12 A	12 A	12 A
Continuous duty up to	100 W total load	100 W total load	100 W total load
Standby power	250 mW	250 mW	250 mW
Synchronization	through bus	through bus	through bus
Size	38,5 x 62 x 265 mm	38,5 x 62 x 265 mm	38,5 x 62 x 265 mm

WELL DESIGNED CONTROL PANELS

For the control of the controllers, many different, attractive control panels are offered, which can be adapted to all kinds of applications.

Control panels without height indication

These series have 2 - 4 keys for up, down and up to two memory positions.

Control panels with height indication

The control panels with height indication show the current height of the table or the present position of the drive. The height can be displayed in centimeters or inches.

Wireless control panels

The wireless control panels communicate with the controller via BLE. Up to 15 wireless control panels can be connected to one controller. The controller must be equipped with a BLE-module.

Water-jet proof control panels IP65

For applications, where the controls are exposed to water-jet, there are water-jet proof versions available, with and without height indication.

Gesture control

The controllers can be operated via gestures. For this purpose, the controller can be equipped with an optical sensor. This is particularly useful in sterile or dirty environments.

App operation

All controllers equipped with a BLE- or WiFi-module can also be operated via an App. The App can perform all functions which can be performed by the control panels.

Control panels for under-table mounting

The control panels for mounting under the table are fastened to the table top from below with 2 screws. The connection cable is then led to the controller and plugged in there.



LD6EC Control panel with up and down button and 4 individually assignable memory keys, digital height display



LD2LC Control panel with up and down button, digital height display



LM4LC Control panel with up and down button and 2 individually assignable memory keys



LM2LC Control panel with up and down button



LM2EC Control panel with up and down button

Control panels for mounting into the table top

The control panels for mounting into the table top are mounted in a recess in the table top. For this purpose, the table top must be milled out accordingly. The connection cable is then led to the controller and plugged in there.



LD21C Control panel with up and down button, digital height display, to be mounted into a 6 mm deep milled recess



LM41C Control panel with up and down button and 2 individually assignable memory keys, to be mounted into a 6 mm deep milled recess



LM21C Control panel with up and down button, to be mounted into a 6 mm deep milled recess



LD6R Control panel with up and down button and 4 individually assignable memory keys, digital height display, bore diameter 60 mm, to be mounted into a 6 mm deep milled recess

Wireless control panel

TYPE LM4RW The control panel connects to the controller via BLE. It is operated with a battery that ensures operation over several years. The control panel can easily be paired and unpaired to the controller.

- Wireless control panel
- 4 memory positions
- The LM4RW control panel will be glued i.e. onto the table top, and then extends approx. 7 mm over the table surface.
- Simply peel off the protective film and place the control panel in the desired position.
- With this solution, the control panel can also be installed by the customer at the desired location, so there is no need to mount or connect the control panel.
- Naturally the panel can be placed at a different location than on the table top.
- The controller must be equipped with a BLE-module for the control panel.
- Up to 15 wireless control panels can be connected to one controller.



Water-jet proof control panels IP65

The water-jet proof control panels for **under-table mounting** are fastened to the table top from below with 2 screws. The connection cable is then led to the controller and plugged in there.



LD2LIP Control panel with up and down button, digital height display, for under-table mounting, water-jet proof, IP65



LM2LIP Control panel with up and down button, for under-table mounting, water-jet proof, IP65



LM4LIP Control panel with up and down button and 2 individually assignable memory keys, for under-table mounting, water-jet proof, IP65

Gesture control with Laing OptoSense

TYPE LOS1 Laing OptoSense is a completely new system to control table controllers. For mounting, only a 10 mm diameter hole is required in the table.

Once mounted, the sensor nicely integrates into the table top and is hardly visible. The sensor is plugged directly into the controller from above, there is no cable required. Suitable for table top thicknesses from 15 mm to 43 mm.

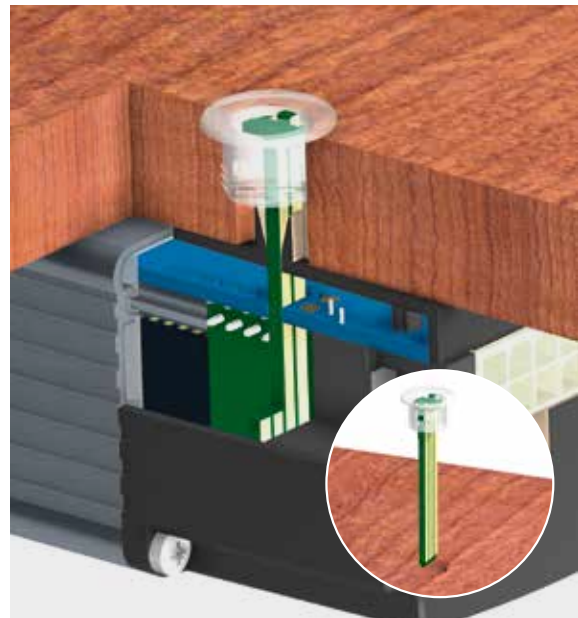
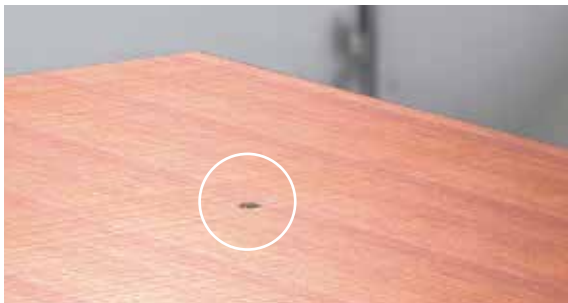
Operation begins with activation. The hand must be held 3 cm to 6 cm above the sensor then the LED lights up. To raise the table, move your hand a few centimeters upwards and hold it in that position until the table starts moving.

To lower the table, the hand must be moved a few centimeters downwards and remain there until the table starts moving.

After the movement has started, the hand can be moved up (maximum 20 cm) and down (to the table top). The movement continues until the hand is removed from the sensor area.

OptoSense assembly

For mounting, a $\varnothing 10$ mm hole is required in the table top, directly above the controller. The controller is screwed to bottom of the table top. The positioning stud on the controller end cap will position the controller to the hole. The sensor element is inserted through the table top from above. Contact is established by conductive traces on the sensor element, which meet contact springs inside the controller.



COLLISION DETECTION

Two collision detection options are offered for the Laing Controllers.

The **current based collision detection** via the evaluation of the drive current is implemented as standard in the Laing Controller.

The **Laing GyroSense** is offered as an option for the controller. An extremely sensitive 6-axis sensor reliably detects even the smallest collisions. Both systems can, of course, be used simultaneously.

Current based collision detection

TYPE LIS 1 All Laing controllers are equipped with a collision detection based on the evaluation of the motor currents. This can be configured according to the actual requirements and usually protects in the event of a collision. The drives stop and, if desired, moves back in the other direction. The sensitivity can be adjusted via the control panels.

Laing GyroSense, the controller-integrated solution for reliable collision detection

TYPE LGS1 Any controller for height-adjustable furniture is only as good as its collision detection system.

This is why the Laing controllers are equipped with a highly sensitive sensor that reacts to even the smallest changes in the inclination of the tabletop. The inclination change and the inclination change speed are evaluated for this purpose. This guarantees a highly sensitive collision detection, even with very rigid connections between table top and table frame.

The Laing GyroSense also reacts when the entire table is tilted and works equally well in both directions, independent of the load on the table. The sensitivity and reaction to a detected collision are configurable and can also be adjusted through the control panels. Since the sensor is integrated into the controller, it does not need to be mounted or connected. Naturally the Laing GyroSense can also be combined with the current based collision detection.



Even hitting a soft ball or a soft armrest is reliably detected by the GyroSense.

COMMUNICATION FROM CABLE TO CLOUD

BLE can be used to connect the controller to a smartphone or PC, by WiFi it can be connected to a higher-level control or integrated into a company network.

By ModBus, even complex movements can be controlled using the information available in the controller such as position, speed and current.

Cloud Connect offers an easy way to connect controllers equipped with a WiFi or BLE to the cloud. This allows the controller to be configured and maintained over the Internet.

Controllers that are not equipped with WiFi or BLE can be configured and maintained over the Internet using the Cloud Interface.

Laing Controllers can be equipped through the controller-integrated expansion ports with various communication possibilities so they are optimally suited for applications like:

- Internet of things
- Office 4.0
- Office-on-demand-solutions
- Industry 4.0
- Home automation
- Voice-activated input
- Fitness Apps

The following communication options are available:

- BLE
- WiFi
- GSM Network
- RS 485/ ModBus
- Wireless control panels
- Analog input



The Laing controllers offer a wide range of communication options.

All communication options allow full access to all information contained in the controller, as well as all controller functions.

Wireless communication via BLE, WiFi and ModBus

BLE

For communication via **BLE**, the internal expansion port of the controller will be equipped with a BLE-module. This allows the controller to communicate with a smartphone, tablet or PC. Via the BLE connection, all information in the controller can be accessed and all functions of the controller can be used. This allows the full range of controller functions to be used in Apps or programs. The Laing App for the controller also communicates via BLE. For the creation of customer-specific Apps, the necessary information will be provided.

WiFi

For communication via WiFi, the internal expansion port of the controller will be equipped with a WiFi-module. This allows the controller to communicate with a smartphone, tablet, PC, PLC or a higher-level control.

Via the WiFi connection, all information in the controller can be reached: Currents, temperatures, voltages, PWM levels, error codes, all information is directly accessible. All functions can also be initiated through this communication channel: Speeds, ramps, PWM levels, positions, currents, everything can be set through the WiFi connection.

This makes it easy to integrate the controller into a higher-level system such as a facility management system. The WiFi-module can be configured with a fixed address or a DHCP server.

ModBus

All controllers are equipped with an RS485 interface for the communication with the control panels or with higher-level control systems. Through this interface all information in the controller can be accessed: currents, temperatures, voltages, PWM levels, error codes, all information is directly available.

All functions can also be initiated through this communication path: speeds, ramps, PWM levels, positions, currents – everything can be set via the RS485/ModBus connection. This makes it easy to integrate the controller into higher-level control systems. The individual outputs of the LMC controllers can also be controlled independently by ModBus. This means that even complex motion sequences can be implemented.

Remote maintenance and service with Cloud Interface and Cloud Connect

Cloud Interface

The controllers offer a wide range of setting options. Even though the controllers are usually delivered to the customer completely configured, in some cases certain parameters may have to be adapted to the actual situation or a controller may have to be monitored remotely.

That's what the Cloud Interface is for. It establishes a direct connection to the controller via the Internet. The cloud interface is equipped with a GSM modem so that the customer does not have to worry about an Internet connection. If a change in configuration is required, the customer receives the cloud interface from the service technician, instead of a visit. The customer only connects the cloud interface through the communication connector with the controller and the control panel and inserts the plug-in power supply. The cloud interface automatically connects to the cloud and can be accessed, from anywhere, via the Internet.

This enables the service technician to check and configure the controller from his desk. Thus, most service travel can be avoided. Systems can also be monitored and controlled remotely.



Cloud Connect

The controllers offer a wide range of setting options. Even though the controllers are usually delivered to the customer completely configured, in some cases certain parameters may have to be adapted to the actual situation or a controller may have to be monitored remotely.

If the controller is equipped with a WiFi- or BLE-module, the controller can be connected to the cloud using a smartphone.

The Laing Cloud Connect App must be installed on a smartphone to establish the connection between the controller and the cloud. The controller can then be configured and maintained through the Internet. This allows the service technician to check and configure the controller from his desk. Thus, most service calls can be avoided. Systems can also be monitored and controlled remotely.

THE LAING CONTROLLER OFFERS QUITE A NUMBER OF ADDITIONAL FUNCTIONS

Synchronization of drives

If more than 4 motors have to be synchronized – or if the power of one controller is not sufficient for all motors – then one of our solutions for the synchronization of drives are used.

Synchronization of two controllers

In this case, the synchronization takes place via the control panel.

Synchronization of more than 2 controllers or of LMC controllers

In this case, synchronization takes place via the HUB, which can be used to synchronize up to six controllers, what can be divided into up to four groups, and to configure a large number of additional functions.

Occupancy signal

Controllers equipped with the controller-integrated Laing GyroSense can indicate the occupancy status of the table.

Safety zone

A safety zone can be activated to avoid accidents during the downward movement.

Safety input

External safety devices such as light curtains or contact strips can be connected to the controller via the safety input.

Synchronization of two controllers by a control panel with height indication

If only two controllers have to be synchronized, it is sufficient to connect them through a Sync-Y-adapter to a control panel with height indication. Then the control panel will synchronize all motors connected to the two controllers.

For configuration the following steps are necessary:

- Configure the controllers like „single controller“ (load configuration file)
- Connect the controllers to the control panel via the Sync-Y-adapter.
- Now the two connected controllers are synchronized by the control panel.



Synchronization via the HUB

TYPE LH 6

The HUB allows up to 6 controllers to be synchronized (the sum of the controllers and control panels connected to the HUB can be a total of 6).

Up to 4 independent groups can be configured, all motors in a group will be synchronized.

The control panels connected to the HUB and WiFi-, BLE-modules or gesture controls in the connected controllers can be assigned to any one or more groups. For example, one control panel can control one group, another can control all groups simultaneously.

Easy to use

Only the HUB has to be configured, the HUB then configures the connected controllers.

If a controller is replaced at any time, the new controller is automatically recognized, and the necessary configuration is loaded into the controller by the hub. In addition to the controllers and control panels with height indication, a maximum of 6 control panels without height indication can be connected. Power is supplied via the bus, no external power supply is required.



Occupied signal

Controllers equipped with the controller-integrated Laing GyroSense can detect, whether the table to which the controller is attached is occupied or not. For this purpose, the movements detected by the sensor are evaluated by the use of special algorithms which determine, whether the table is occupied or not. The occupation state can then be communicated by BLE, WiFi or ModBus, or can be queried by a facility management system.

Safety zone

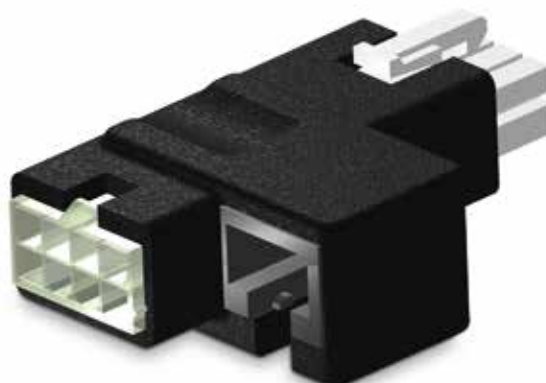
Where necessary, the safety zone can be activated, and a lower speed be entered. When the set height is reached during the downward movement, the controller stops the movement.

Pressing the down button again will resume the movement at the selected lower speed.

Safety input

External safety devices such as light curtains or contact strips are connected to the controller at the safety input. Depending on the configuration, the controller reacts to the opening or closing of the safety input contacts.

When tripped, the controller reacts as in the event of a collision. The movement is stopped, and the motors move in the opposite direction by the set amount.



APPS AND TOOLS

Software tools

For the configuration of the controllers, a powerful wizard is offered by which the controllers can be adapted to the connected drives in just a few minutes. The configuration files created with the wizard can be loaded into the controller within a few seconds using the download tool. The controller does not have to be connected to the mains.

The controllers have an integrated long-term test function; the long-term test tool can be used to start the long-term test and read out the current values from the controller.

Apps are available for IOS and Android, by which the controller equipped with BLE or WiFi can be operated via smartphone.

Wizard

With the Wizard, all settings necessary for operation such as speed and ramps can be made. The Hall sensor pulses per mm and the direction of the motors and Hall sensors can be determined in an easy way. Once the configuration is done, a configuration file can be created, by which, further controllers can be configured.

Downloader

With the Downloader, the configuration files are loaded into the controllers. The controller only needs to be connected to the interface cable. A mains connection is not required. The download only takes a few seconds, then the controller is configured.

Long-term test tool

This tool is used to enter the parameters for the long-term test. The controller then carries out this test independently, no connection to the PC is required. To read out the actual status, the PC can be re-connected at any time.

Service tool

With the Service tool, all status information can be read out and all settings can be made to the controller. Graphical evaluations are also possible, which are helpful for setting the control parameters. This tool is only used by the Laing Service team.

Apps to control the table with Activity Assistant

Apps are available for Android and iOS, which communicate with the controller via the BLE-module. The App automatically establishes the connection to the controller, then the user settings in the controller are set to the values stored in the smartphone. This automatically individualizes the controller.

Where allowed, the voice control can be used, that can initiate the movement by individually definable voice commands. The functions of the Apps are continuously expanded.

The following functions are available:

- Assign a name – the controller is assigned a name by which it is identified in the App
- Private desktop – the controller is permanently assigned to a user, other users have no access
- Auto Connect – the App automatically connects to the selected controller
- Set the 4 memory positions
- Upper user limit
- Lower user limit
- Collision detection sensitivity
- Reference run
- Standing and sitting times for the Activity Assistant
- Display metric or imperial



LAING INNOTECH

LAING CONTROLLER

by Laing Innotech GmbH + Co. KG

Laing Innotech GmbH + Co. KG
Theodor-Heuss-Str. 23
71566 Althütte | Germany

Phone +49 7146 9999 010
Fax +49 7146 9999 011
Email: Info@Laing-Controller.com