

COMPACT^{eco}

Firmware-Version 1.9

Document Rev1

User Manual

LOGIC
office

Cascading of
motor control units



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1 Definition of Cascading

Cascading enables you to operate up to 12 motors synchronously by connecting up to four control units.

This User Manual describes the functions in such a system.

1.1 Master

In a cascaded system, the control unit that the handswitch is connected to is the master. This control unit is the only one in the entire network to accept input from the handswitch and therefore plays the most important role.

1.2 Slave

Slaves are control units serving to expand the master and are connected to the master with special cascade cables. Do not connect any handswitches to these control units.



Note: the cascaded network will not accept handswitch input if the handswitch is connected to a slave.



Note: a cascaded network consisting of two to four control units is to be regarded as a closed system. (Example: if there are instructions in the manual to disconnect the power supply, do so for all the control units in the network. It means that all the control units should be in a de-energized state at the same time.)

1.3 Single Mode

When a control unit is in single mode, the cascading function is active, but it is operated as a single control unit only.



Note: as long as a control unit is still at the factory settings, it is not defined as a master or slave. It is the first keystroke that decides whether and which control unit will operate as master and slave (see chapter 2.3) or whether it is a single control unit.



Note: you can restore the factory settings by re-parameterizing the control unit or using the S0 menu (see chapter 3.2).

1.4 Single control unit

If a control unit is not parameterized for cascading, it can only be used as single control unit.

2 Commissioning



Note: if the system is to function correctly, we strongly recommend following these instructions step by step, otherwise serious complications may arise.



Note: to make sure that the control unit is suitable for the planned cascading network, find and check the control unit parameters in ConfigTool Customer.



Note: do not connect a control unit that is **not** at the factory settings.

2.1 Components required

To create a fully functioning network, you will require the following components:

Network with 2 control units

- ① 1 handswitch, model HSF – 4M4
- ② 2 COMPACT-e-3
- ③ 2 power cords
- ④ 1 cascading cable
LOG-CBL-SYNC-500
- ⑤ up to 6 drives

Network with 3 control units

- ① 1 handswitch, model HSF – 4M4
- ② 3 COMAPCT-e-3
- ③ 3 power cords
- ④ 3 cascading cables
LOG-CBL-SYNC-1500
- ⑤ up to 9 drives

Network with 4 control units

- ① 1 handswitch, model HSF – 4M4
- ② 4 COMPACT-e-3
- ③ 4 power cords
- ④ 4 cascading cables
LOG-CBL-SYNC-1500
- ⑤ up to 12 drives



Note: for drives with one single hall sensor, it is only possible to set up a network with 2 control units.



Note: you will find information on the various cascade cables in chapter 6.2.

2.2 Connecting motors

Here you have to decide whether you wish to use one or two motor groups in your system.

2.2.1 Configuration with only one motor group

If the overall system only has one motor group, the motors can be allocated to the control units as required (provided that they have been parameterized).

2.2.2 Configuration with two motor groups

If the overall system has two motor groups, you have to connect the motors to the relevant control unit as defined in the configuration.



Note: when using two motor groups, always observe the motor configurations for the control units used.



Note: chapter 6.1 shows examples of possible motor configurations.

2.3 Connecting the handswitch

If you only intend to use one motor group in the system, you can plug the handswitch into the 7-pin handswitch socket (HS) on any control unit that is to act as the master during operation.

When using two motor groups, you have to connect the handswitch to a control unit that uses both motor groups.



Note: when connecting the handswitch, take the motor configuration used in the network into consideration.



Note: LOGICDATA recommends using a comfort handswitch with display and MEMO function for cascading.



Note: chapter 6.1 shows examples of possible motor configurations.



Note: when a control unit is still at factory settings and a key is pressed on a handswitch for the first time, it is declared to be the master. This is why the handswitch may only be plugged into the appropriate control unit.



Note: it is not possible to use more than one handswitch in the network, as only the master can accept handswitch input.

2.4 Connecting the cascading cable

To enable operation in a network, plug your control units into the Logic Connector DATA using the cascade cable.

In addition, you can also connect an external sensor with the LOG-CBL-LC-DATA-Y distribution cable (see chapter 4).



Note: if you wish to operate three or four control units, use the LOG-CBL-SYNC-1500 cable.



Note: to operate two control units, you can use the LOG-CBL-SYNC-500 cable.



Note: you will find information on the various cascade cables in chapter 6.2.



Note: in chapter 6.1 you will find examples of possible networks and the components to be used.



Danger: if you connect a cascade cable to a single control unit, the control unit will misinterpret it and the ISP settings can subsequently be affected. As a result, **never** use a cascade cable in single mode.



Note: to ensure that operation is as reliable as possible, we recommend making sure when installing the cascade cables that they are not subjected to any mechanical loading (e.g. twisting).

2.5 Connecting the power cords

Before you supply power to all the control units, check that you have performed all the previous steps correctly and your network basically corresponds to the one shown in chapter 6.1.



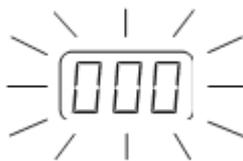
Caution: before you plug in the power cords, check again that

- The mains voltage is suitable for your control unit as indicated on the nameplate
- All the components are plugged into the correct sockets

2.6 Initial reset for the motors

After you have connected the control units to the power supply for the first time, you have to reset the motors once, as the network is also addressed at the same time.

1.



000 must flash on the display. That indicates that the system is waiting to be reset.

2.



Press the **desktop down key for the first motor group**.

The motors in the appropriate motor group should now start to reset at reduced speed. Keep pressing the key until the desktop reaches the lowest position, which is indicated by an audible click.

3.

Wait at least 3 seconds after resetting the first motor group. During this time frame, motor detection is completed and saved.

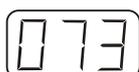
4.



Press the **desktop down key for the second motor group**.

The motors in the appropriate motor group should now start to reset at reduced speed. Keep pressing the key until the desktop reaches the lowest position, which is indicated by an audible click.

5.



The display will now show the current (saved) desktop position.



Note: please refer to the document *Manual_HSF-MDF-4M4_English* for other handswitch functions.



Note: you have to reset the motor groups in the right order (first motor group 1, then motor group 2).



Note: it takes about 5 seconds for the motor groups to start the reset.



Danger: while or immediately after resetting the motors, you must check whether the motors in the relevant motor group are actually adjusting the desktop → **the system can be damaged if it does not start straight.**



Note: if not all the motors to be parameterized have been adjusted correctly, first of all check all the electrical connections (including cascade cables, motor cables, etc.). Restore the factory settings on the control units (see chapter 3.2) and then reset the motors again.



Note: the reset must be fully completed, as the system will not otherwise be operational.



Note: if an error occurs while a motor is being reset (i.e. error message on the display, motor not operating correctly), you have to restore the factory settings on the network (see chapter 3.2).

3 Operating a cascaded network

To ensure safe operation of the network, please follow the safety instructions listed below:



Danger: keep children away from electric height-adjustable desks, control units and handswitches. There is a risk of injury and electric shock.



Caution: if there is a thunderstorm or you do not intend to use the desk for a longer period, unplug the power cord from the socket. Power surges could otherwise cause damage.



Note: for information on the basic functions, please refer to the user manual of the COMPACT^{eco}.



Note: the motor group capable of saving memory positions depends on the software parameters configured for the COMPACT^{eco}. If both groups can store memory positions, both groups' current positions will be saved (even if they are different). If you recall a memory position, the motor groups adjust the desktop to the position one after another. This means that first the first motor group adjusts the desktop to the position and only when it is reached does the second group adjust.

The following features are available in the different operating modes:

	Single control unit	Cascaded network or single mode
Maximum number of drives	3 (COMPACT-e-3)	Up to 12 (4x COMPACT-e-3)
Movement of one motor group		
Movement of two motor groups		
Save and recall memo positions	 (for both motor groups)	 (for both motor groups)
Change displayed desktop height	 (for both motor groups)	 (for both motor groups)
Manual reset	 (for both motor groups)	 (for both motor groups)
Limit position calibration (S7-Menu)	 (for motor group 1)	 (for motor group 1)
Low Speed Area	 (for both motor groups)	 (for both motor groups)
Safety Area	 (for both motor groups)	 (for both motor groups)
Container-Stop / Shelf-Stop	 (for motor group 1)	 (for motor group 1)
Plug Detection	 (for both motor groups)	 (for both motor groups)
Auto Detect Number of Drives	 (for motor group 1)	 (for motor group 1)
Duty cycle		

	Single control unit	Cascaded network or single mode
Change displayed desktop position (cm or inch, S5-Menu)		
Change number of drives (S8-Menu)		
Reset control unit to factory settings (S0-Menu)		
Intelligent System Protection ISP		
Collision protection with ACS-CB-SENS	 2 per control unit	 1 per control unit in cascaded network or 2 per control unit in Single-Mode
Collision protection with squeeze line	 2 per control unit	 1 per control unit in cascaded network or 2 per control unit in Single-Mode
Drive back		
Error messages on the handswitch display		
Click codes		
Error indication with LEDs	 with COMPACT-e-3	 with COMPACT-e-3

3.1 Changing the network

If you need to replace one or more control units in a network, proceed as follows:

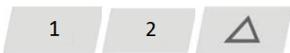
1. Before you start to replace any control unit with new ones, reset all the control units in the planned network to factory settings (see chapter 3.2).
2. Disconnect the entire network from the mains power.
3. Create the new network (see chapter 2)



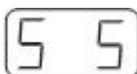
Note: do not connect a control unit that is **not** at the factory settings.

3.2 Restoring factory defaults (S0 menu)

With this function you can reset the control unit to its factory settings.

- 

Press the keys **memory position 1, 2** and the **desktop up key** at the same time. Keep the key combination pressed for about 10 seconds. Then release the keys.



The display will show **S and a number**, e.g. **S 5**.

- 

Press the **desktop up key** until the display reads **S 0**.



The display will show **S 0**.

- 

Press the **memory key**.

The control unit will be reset to its factory settings. The control unit is now in the same state as it is when the commissioning is done.



Note: this enables you to break up a cascaded network and use each control unit in single mode or create a new network.



Note: when you open the S0 menu, all the control units in the network will be reset to the factory defaults.



Note: before you make any changes to the network (e.g. parameters, configuration), you always have to restore the factory settings.



Note: the menu timeout is 5 seconds, this means that the menu will close automatically without storing new settings if the user does not press a key for 5 seconds.



Note: after starting the menu, the display will read **S and any number**, for instance **S 5**. The number depends on the parameters of the control unit.



Danger: if drives are replaced in the cascaded network, the network needs to be reset to the factory defaults and the drives must be reset.

4 Collision protection

Besides the integrated collision protection ISP, also external sensors as ACS-CB-SENS or squeeze lines can be used in a cascaded network. These sensors must be connected to the control unit(s) using the split cable LOG-CBL-LC-DATA-Y on the LogicConnector DATA.



Danger: in spite of ISP being in place, there may still be a risk of pinching in exceptional cases, as it is not only the control unit, but also the interaction between the mechanical and electronic systems that is responsible for cutting out the motor. In addition, the mechanical components, motor and ambient conditions all affect cut-out sensitivity.

As the control unit manufacturer, LOGICDATA cannot therefore eliminate this residual risk completely or accept any liability.



Note: the ISP-sensitivity and the ISP-cutoff value depend on the whole system (mechanical and electrical components). To evaluate the ISP-capability of a height adjustable table, please contact LOGICDATA!



Note: if you use external safety sensors in connection with cascading, please note that only **one** sensor per control unit is supported.



Note: you can however combine several different types of sensors in the network. Ensure that control unit parameterization is suitable for the sensor connected.



Note: external sensors must be activated by parameters.



Note: when control units are only parameterized for the second motor group, do not connect and parameterize any safety features (e.g. ISP software, sensors).



Note: if you use external sensors in a cascaded network, a sensor must be connected to the master. Do not plug external sensors into slave control units only.



Note: a control unit has not detected the sensor until it has acknowledged the fact with two clicks. After resetting the motor, always wait for confirmation that the sensor has been detected.



Note: chapter 6.1 gives examples of how external sensors are to be used in the network.



Note: you will find information on the split cable LOG-CBL-LC-DATA-Y in chapter 6.2.3.



Note: To disconnect a sensor from the system, it must be deactivated in the control unit. The first step is to unplug the sensor and the next to restore the factory settings on the control unit (see chapter 3.2).

5 ConfigTool Customer



Note: use ConfigTool to parameterize a control unit for the required application.



Note: before applying the parameters to the control unit, check the settings again.



Note: it is only possible to parameterize one control unit after another. This means that you cannot parameterize all the control units in a network at any one time.



Note: before changing any parameters, you have to restore the factory settings in the entire network first (see chapter 3.2).

5.1 Saving a parameter



Note: please adhere strictly to the procedure described below.

Step 1: Start the LOGICDATA ConfigTool software



Note: before proceeding with step 2, check that nothing is connected to the control unit and that its power supply has been disconnected from the mains. In addition, ensure that you do not connect it to the PC with the ACS-CB-USB-PROG until instructed to do so.



Note: there must be nothing connected to the control unit (e.g. motors, handswitch, external sensors, cascade cable, power cord) without exception.

Step 2: Search in your PC's memory for the required parameter file

On the ConfigTool menu, click File → Open File. The following window will be displayed.

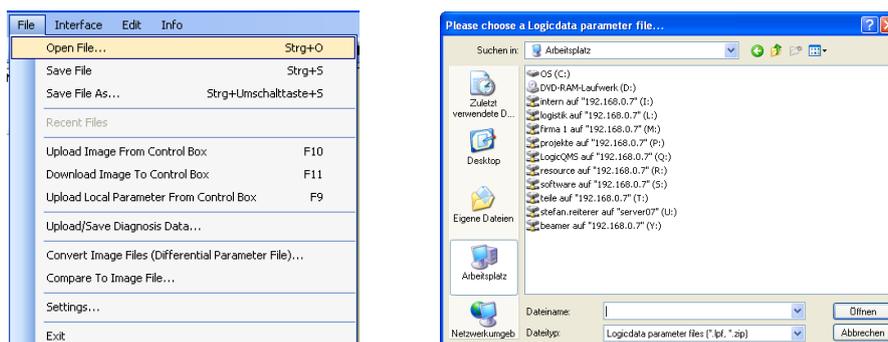


Figure 1: Dialog box for parameter files

Now search for the required parameter file and click Open.

Step 3: Connect the power supply to your control unit

As soon as you have plugged the power cord into the control unit and a socket, you will hear a double click from the control unit.

Step 4: Connect the control unit to the PC

To do so, use the ACS-CB-USB-PROG programming cable. The cable has a USB plug for the PC and a blue DIN connector that is plugged into the handswitch socket on the control unit.

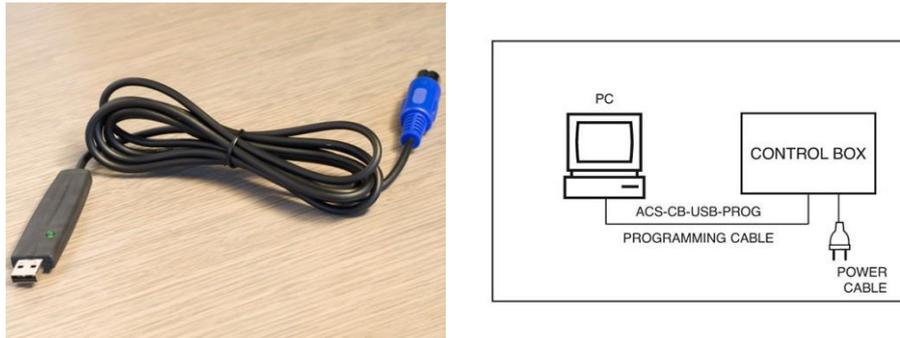


Figure 2: ACS-CB-USBPROG programming cable and system configuration in step 4

In the computer program, a green light should now go on at the bottom left of the screen indicating that the control unit is connected to the PC.

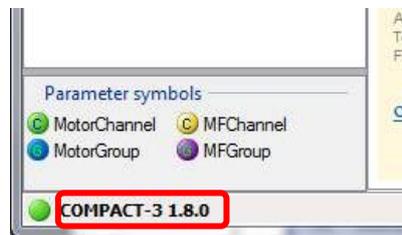


Figure 3: ConfigTool after successfully connecting the control unit



Note: if you cannot make any connections, you may have to select the correct serial interface first. All the available COM ports are listed on the Interface menu in ConfigTool. Choose the correct COM port here.

Step 5: Start the save process in ConfigTool

Press the following button in ConfigTool Customer:

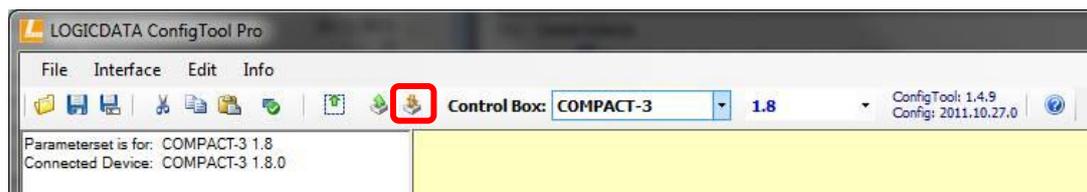


Figure 4: ConfigTool Customer: starting the save process

During the process, the ConfigTool window will appear as shown in the screenshot below.

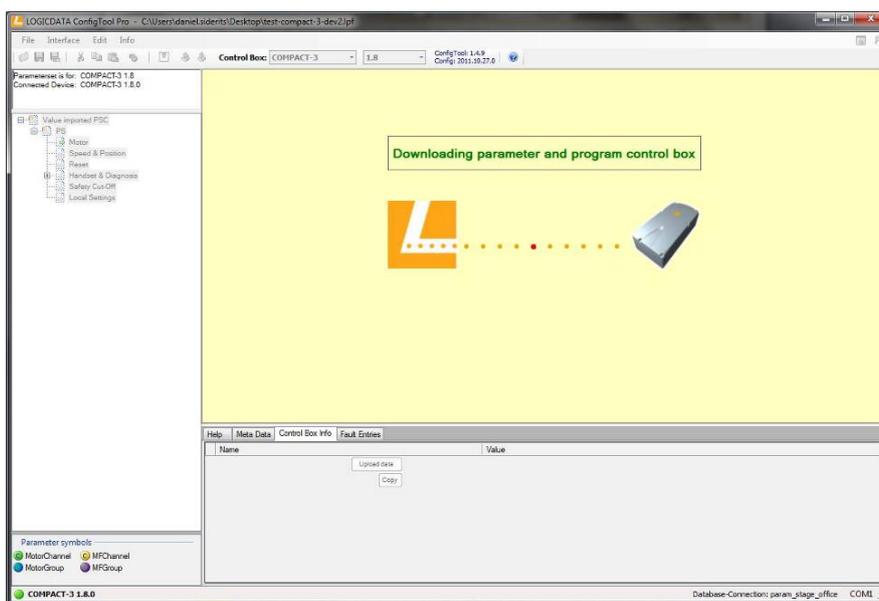


Figure 5: ConfigTool Customer during the save process



Note: do not unplug any connectors while saving data.



Note: should any error messages be displayed while you are saving data, try the complete procedure again. If the error occurs again, please contact LOGICDATA.

Step 6: Restore the factory settings on the control unit (S0 menu)



Note: even if you have not saved any new parameters on the control unit, you should restore the factory settings on the control unit after disconnecting from ConfigTool (see chapter 3.2).

Step 7: Disconnect the control unit from the power supply

Step 8: Repeat steps 2 to 7 for all the control units to be used in the network



Note: Some settings for the control units in the cascaded network might make it necessary that each control unit needs separate parameter files (e.g. ISP settings or motor group settings). Therefore, choose the appropriate file for each control unit.

Step 9: Plug all the motors, external sensors and cascading cables into the appropriate sockets (parameterized for the purpose)



Danger: you have to plug the motors in the relevant motor group into the control units as they are parameterized.

Step 10: Connect the control units to the power supply

5.2 Important parameters

This chapter will give an overview of the basic parameters for a control unit in a cascaded network.

5.2.1 Enabling cascading

You can enable or disable cascading under *Special Settings*.

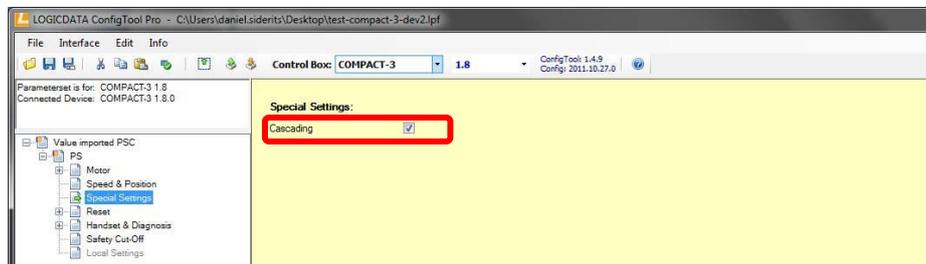


Figure 6: Enabling/disabling cascading

5.2.2 Enabling Auto Detect Number of Drives

You can enable or disable automatic detection of the connected motor number under *Motor*.

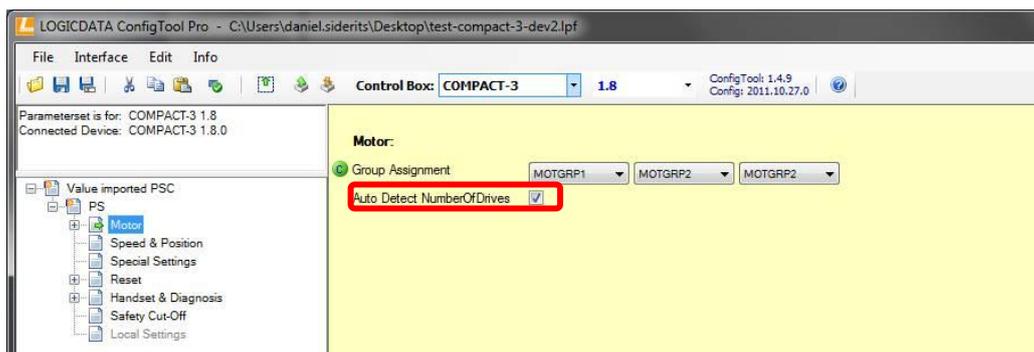


Figure 7: Enabling/disabling Auto Detect Number of Drives

5.2.3 Collision protection

You can change the ISP settings under *Safety Cut-Off*.

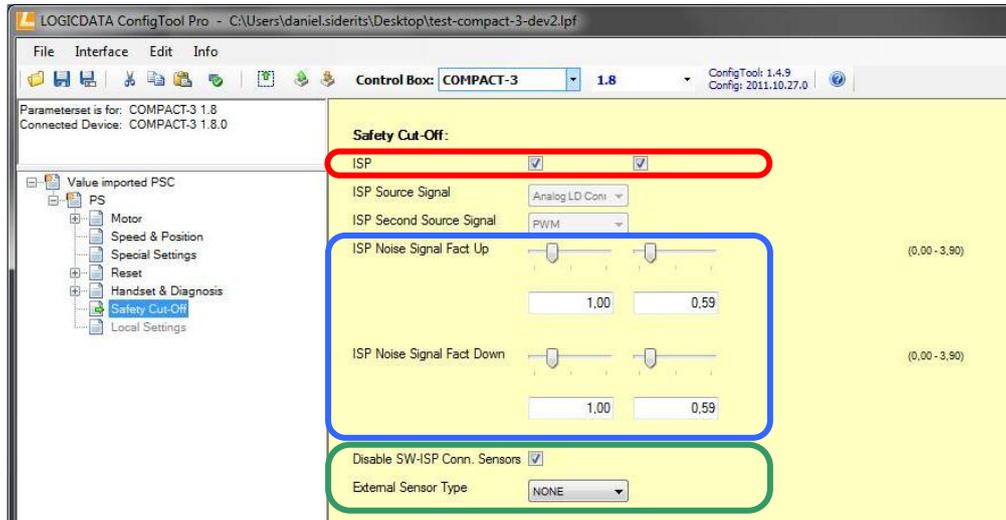


Figure 8: Parameters for ISP

-  This allows you to enable or disable ISP.
-  Use the sliders to adjust ISP sensitivity for the relevant source (e.g. ISP software, external sensors).
-  Use these elements to deactivate Software-ISP in case of a connected external sensor and to choose the external sensor type.



Danger: in spite of ISP being in place, there may still be a risk of pinching in exceptional cases, as it is not only the control unit, but also the interaction between the mechanical and electronic systems that is responsible for cutting out the motor. In addition, the mechanical components, motor and ambient conditions all affect cut-out sensitivity.

As the control unit manufacturer, LOGICDATA cannot therefore eliminate this residual risk completely or accept any liability.



Note: the ISP-sensitivity and the ISP-cutoff value depend on the whole system (mechanical and electrical components). To evaluate the ISP-capability of a height adjustable table, please contact LOGICDATA!

6 Appendix

6.1 Examples of possible motor configurations



Note: As soon as two motor groups are used in the network, the master must be a control unit to which motors in both motor groups are connected.

Network with 4 motors in the first motor group

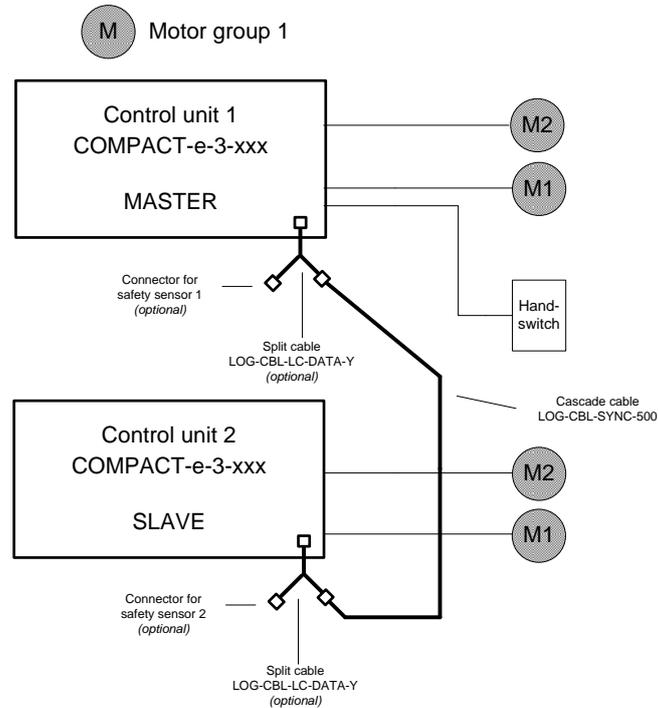


Figure 9: Network with four motors in the first motor group, optionally with external sensors

Network with 3 motors in the first and one motor in the second motor group

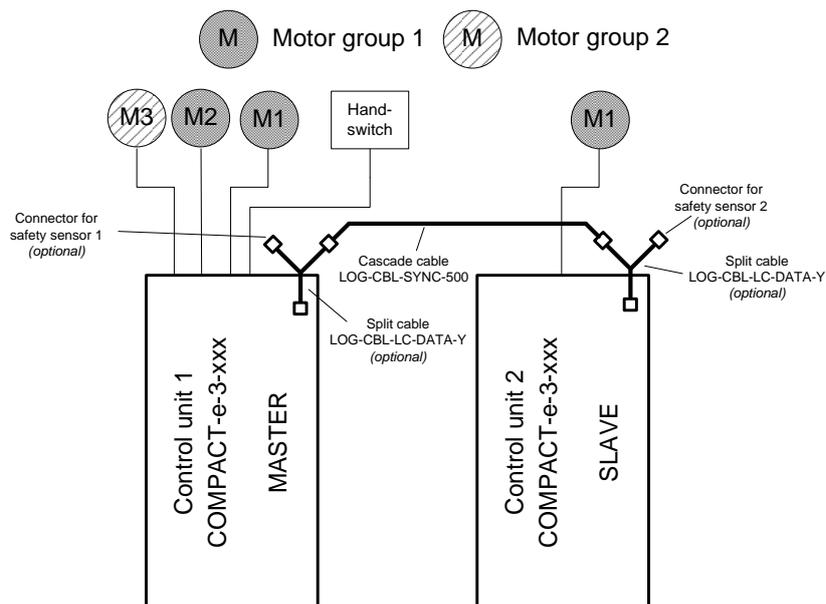


Figure 10: Network with three motors in the first and one motor in the second motor group, optionally with external sensors

Network with 4 motors in the first and one motor in the second motor group

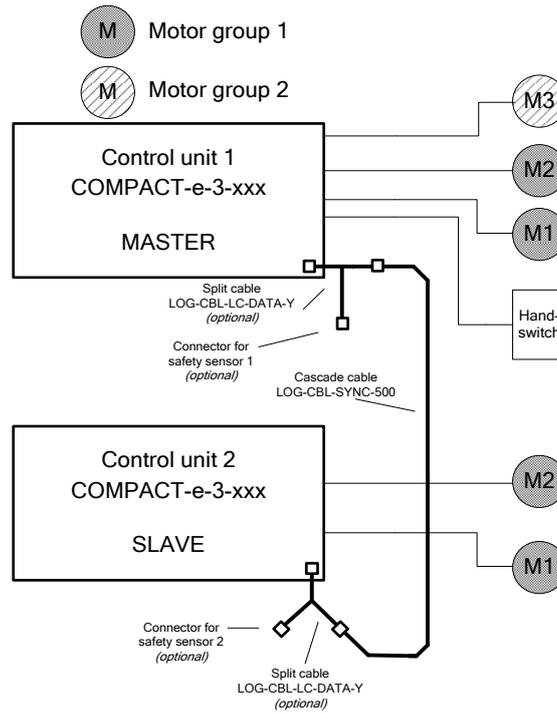


Figure 11: Network with four motors in the first and one motor in the second motor group, optionally with external sensors

Network with 2 motors in the first and 2 motors in the second motor group

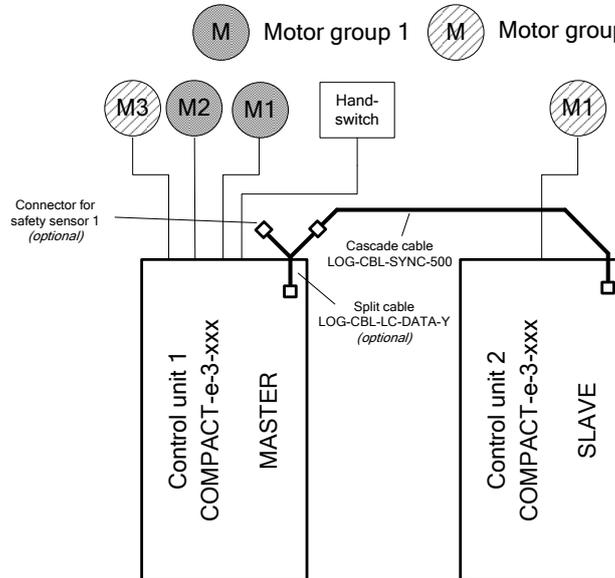


Figure 12: Network with two motors in the first and two motors in the second motor group, optionally with external sensors

Network with 3 motors in the first and 2 motors in the second motor group

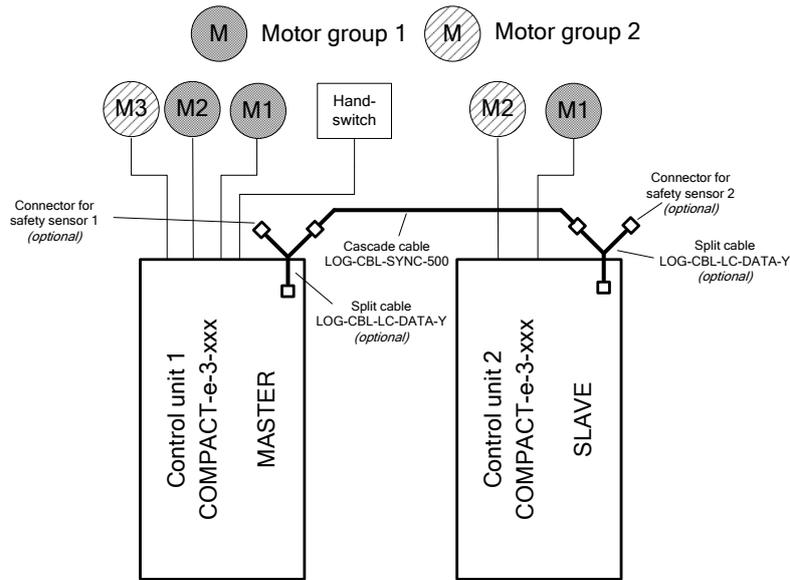


Figure 13: Network with three motors in the first and two motors in the second motor group, optionally with external sensors

Network with 6 motors in the first and 3 motors in the second motor group

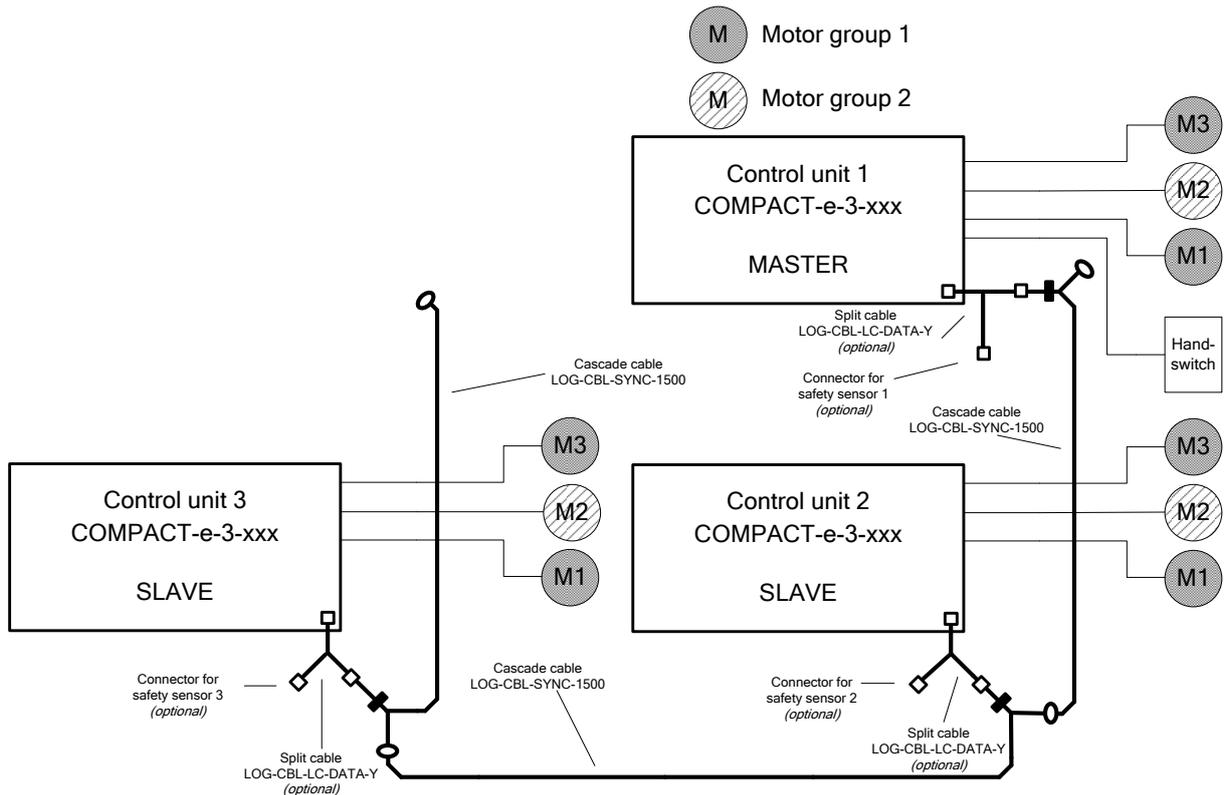


Figure 14: Network with six motors in the first and three motors in the second motor group, optionally with external sensors

Network with 8 motors in the first and 4 motors in the second motor group

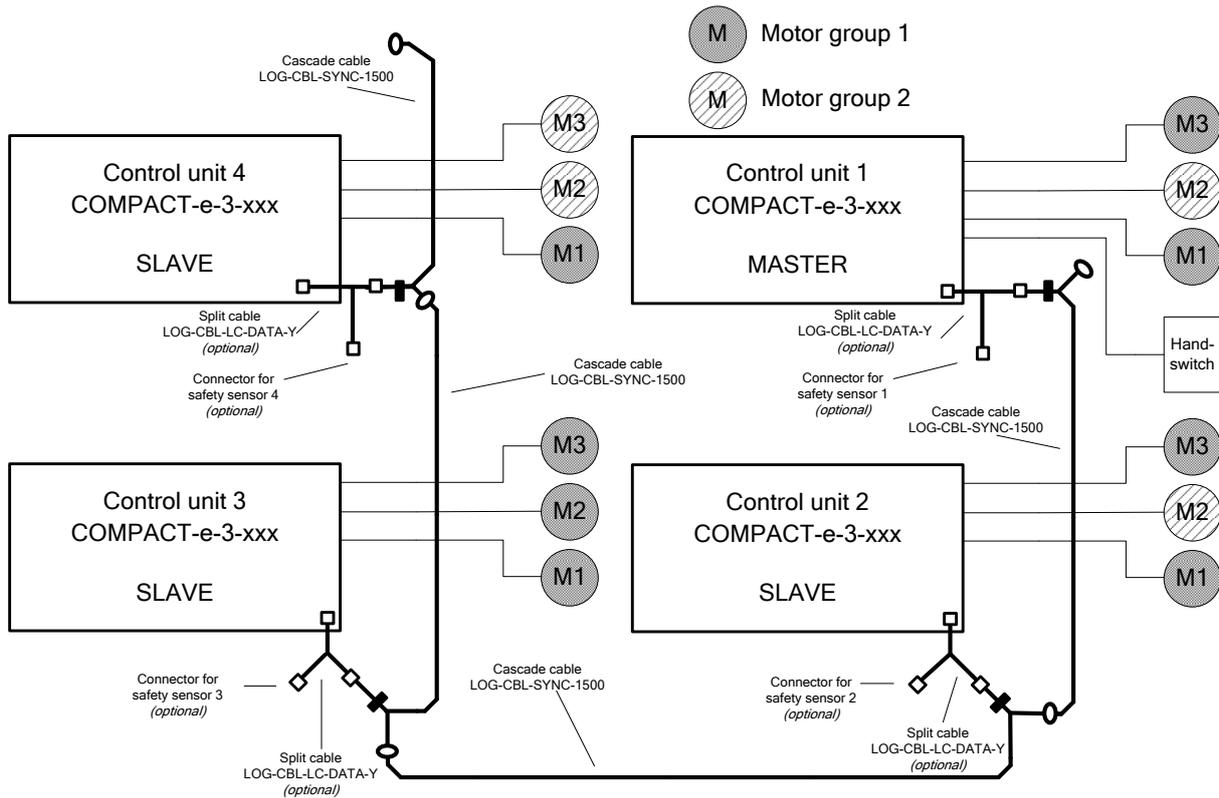


Figure 15: Network with eight motors in the first and four motors in the second motor group, optionally with external sensors

6.2 Pictures

6.2.1 Cascading Cable LOG-CBL-SYNC-500

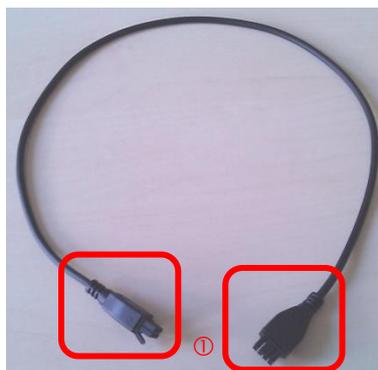


Figure 16: Cascading cable LOG-CBL-SYNC-500

- ① The plugs are for connecting two control units with the LogicConnector DATA in order to use them in a cascaded network.

6.2.2 Cascading Cable LOG-CBL-SYNC-1500

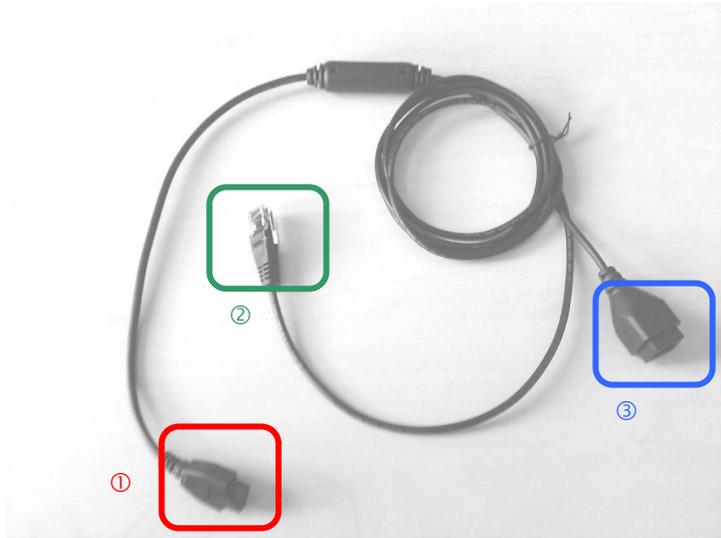


Figure 17: Cascading cable LOG-CBL-SYNC-1500

- ① The plug is for connecting 2, 3 or 4 control units with the LogicConnector DATA in order to use them in a cascaded network.
- ②/③ Plug 2 and socket 3 are for connecting to other cascading cables of type LOG-CBL-SYNC-1500

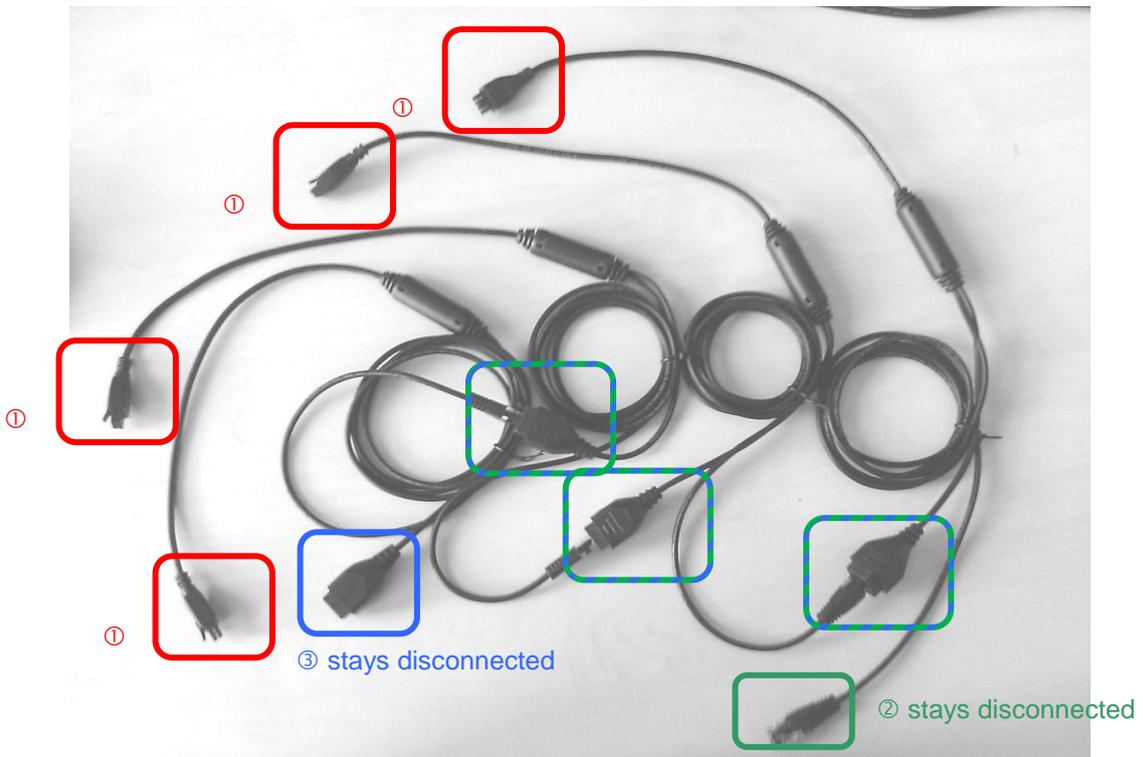


Figure 18: 4 connected LOG-CBL-SYNC-1500

- ① The plug is for connecting 2, 3 or 4 control units with the LogicConnector DATA in order to use them in a cascaded network.
- ②/③ The remaining plug 2 and the remaining plug 3 stay disconnected

6.2.3 Split cable LOG-CBL-LC-DATA-Y

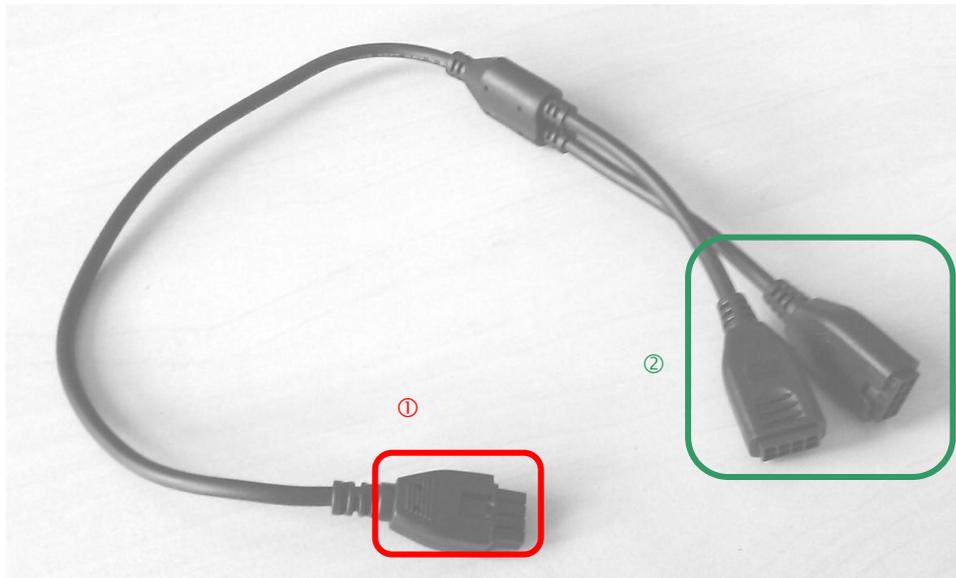


Figure 19: Split cable LOG-CBL-LC-DATA-Y

- ① This plug is connected to the LogicConnector DATA
- ② Both cascade cable and safety sensor can be connected here



Caution: do not ever plug a cascade cable into both sockets at the same time.

6.3 Cascading error messages on the handswitch display



The display reads **E** + an error code.

Cause	Remedy
There is an internal fault in the COMPACT ^{eco} control unit.	Proceed as indicated in the following list.

Number	Description	Remedy
93	<p>Connection error in the cascaded network</p> <p>(The error appears on the display for 15 seconds and then the control unit goes into reset mode with the display flashing 000)</p>	<p>Check all the cable connections and try to reset the motors.</p> <p>If you cannot reset the motors, disconnect all the control units from the power supply. Wait for at least 5 seconds and then reconnect all the control units to the power supply. Try again to reset the motors.</p> <p>If you still cannot reset the motors, please contact customer service.</p>



Note: you will find a complete list of error messages in the appendix of the COMPACT^{eco} User Manual.

Important: if the remedy involves connecting and disconnecting a control unit (which is the same as switching it on and off), do so for all the control units in the cascaded network. It means that all the control units should be in a de-energized state at the same time.



Note: in case of a plug detection event it might be necessary to reset both motor groups.



Note: if not all the control units are on standby when the power supply to at least one control unit is disconnected, it will be interpreted as connection error E93.



Note: if the mains power breaks down or is disconnected from the control unit during movement of the drives, a manual reset might be necessary.

7 Further information

7.1 Technical data



Note: you can find the technical data of your control unit in the appropriate datasheet.

7.2 Optional products



Note: information about available optional products can be found in the latest product catalogue and on the website www.logicdata.at

7.3 Manufacturer

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