OPERATING INSTRUCTIONS

MPC 4ID8

(Translation)

Control system for kinetic drives

in accordance to BGV D8 and D8 Plus / IGVW SQ P2

Safety first – Made in Germany

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1 Safety instructions

1.1 General

- Read and follow the operating instructions and the listed operation and safety notes.
- These operating instructions must be consulted without fail whenever the control system is sold or transferred, or new staff are being trained in its use to ensure that the new operators/users are able to inform themselves in full as to its functionality and of the safety instructions.
- The devices were designed for the control of professional kinetic stage drives with 3-phase AC motors in the course of setup and dismantling. No other use is permissible. The devices may be operated only by specialists who have been instructed and trained in their use.
- The devices should be put into operation by adults only. Any handling of the devices by minors must be forbidden.
- Any electrical work required for the installation and maintenance of the devices must be performed by a qualified technician/electrician or by personnel of similar proficiency.
- After unpacking the device ensure that it is intact and complete. If this is not the case, please contact our Service department immediately.
- Ambient temperatures above 40° C and below 1° C should be avoided.
- Protect the devices from moisture, dust and vibration.
- If the devices are exposed to large temperature differences between storage and operation (e.g. in touring applications) sufficient acclimatisation time must be allowed to prevent irreparable damage being caused by condensation.
- The penetration of liquids or metal objects into the device should be avoided.
- In view of their IP21 protection class, outdoor operation is only possible if external measures are taken to protect the devices from the adverse effects of weather and in particular moisture.
- Do not open the devices. There are no components inside capable of being repaired by the user.
- Do not dismantle or modify the devices.
- Never attempt to repair the devices yourself.
- In the event of a serious malfunction, switch off and unplug the devices before contacting your nearest service centre or the manufacturer for the equipment to be examined and if necessary repaired.

1.2 Intended Use

The control system consisting of the devices MPC 4IDB and MRC xED8 complies with the EN 60204-32 directive and is designed for installation operations using lifting gear such as electric chain hoists and winches at low speeds (≤ 10 m/min) or similar stage drives designed with 3-phase induction motors using 400 V AC phase-changing circuitry. No other use is permissible. The devices may be operated only by specialists who have been instructed and trained in their use. Inappropriate and improper use will render the product warranty null and void.

Because the devices combine with the connected drives to form an entire system, it is absolutely essential that the connected drives comply with BGV D8 or D8 Plus / IGVW SQ P2 and are inspected and tested at appropriate intervals. If this is not the case, the operation of the entire system and therefore also of the control system can no longer be regarded as being in conformity with BGV D8 or D8 Plus. Here it is a case of the weakest link in the chain determining the maximum safety.

Equal consideration must be given to all the slings, constructional elements, suspension points and suspended loads involved in their use. In the selection and dimensioning of all the bearing elements (e.g. suspension points, girder clamps, shackles, steel wire, roundslings, trusses, decorative elements etc.) found in the force flow, the loads and hazards involved in each case must also be taken into account (see also IGVW SQ P2 and BGI 810-3).

In this context, particular attention and consideration must be paid to the following factors:

- the unladen weight of the chain hoist
- dynamic factors involved in the operation
- factors arising from errors

NB:

The operator always bears the overall responsibility for the system he is operating. He must familiarize himself with the relevant and applicable guidelines, norms and standards and observe them at all times. Before each use, he must conduct a risk assessment and analysis of the system configuration in question and determine in accordance with his findings the requisite safety standards for the individual components, for the overall system and also for the run parameters and keep a written record of his findings.

For this purpose, the following basic principles and guidelines should be observed:

- BGV D8
- IGVW SQ P2
- BGI 810-0
- BGI 810-3

The applicable guidelines, norms and standards for setting-up, dismantling and operating the system are invariably governed by the degree of hazard (risk assessment), and this must be determined by the operator/user.

Furthermore, the specific laws, regulations and structural requirements of the country and/or state in which the devices are being used must be observed at all times.

1.3 Power supply/phase sequence correction

According to VDE 0100 Part 722, in the case of temporary installations a residual current device (RCD) must be included in the supply circuit. Since the MPC 4ID8 Controller has no integrated residual current device, it must be noted that to ensure optimal personnel protection when the device is used in a temporary installation, a suitable residual current device with a tripping current of max. 30 mA must be present in the upstream supply cabinet or power distributor. The MPC 8ED8 can optionally be delivered with a factory-fitted RCD 30 mA (retrofitting is not possible).

It is essential to ensure that all three phases (400 V) are present at the device and that the rotating field has a clockwise rotation. In the event of an error, an orange LED will light up on the front panel of the housing. Operation is then prevented by an internal safety device and is therefore NOT possible. The drives cannot run. To eliminate the problem, two of the phases can be exchanged using the phase-changer housed in the plug. If the fault persists, the supply line should be examined.

To correct the rotary field, the CEE phase-changing plug is equipped with a mechanical device that allows you to swap round two of the phase terminals. Using a broad screwdriver, push down on the slot between the two phase terminals and then turn it through 180 degrees so that the two pins swap positions. As soon as the downward pressure ceases, the two pole contacts will latch into their new positions.

Now plug the CEE connector cable back in and if all the phases are present and there is no further fault, the Phase Error LED will go out after a short amount of time.

If one phase is missing, the green phase LED (R-S-T) assigned to it on the front panel of the controller will fail to illuminate. This will be due to a fault in the external power supply or a defective cable in the supply line. This fault is also monitored for, as are phase asymmetry and undervoltage errors, with the run being interrupted in each case if an error is detected.

For this reason, the electrical connection systems connected to the controllers should be fully tested with a load tester (e.g. Duspol) by an authorised/specialist technician before the cable is connected and the device brought into service.

All supply voltage errors are indicated visually by means of the orange Error LED.

Note in particular:

The power supply cable should never be removed during operation. Always halt the drives in motion first, using the Power switch on the device, and isolate the connected hoists altogether from the power supply.

1.4 E-STOP button (Emergency STOP) button

The E-STOP button on the remote control (MRC 4/8/12/16/24/32ED8) shuts down all the connected drives immediately under all operating conditions. This also applies to drives connected to the MPC controller via the M-LINK system (see 'M-LINK system' on §4.10)

To unlock the E-STOP button again, take hold of the button and turn it gently to the right.

1.5 Improper Use

If non-conforming connector cables or connection leads not authorized by the manufacturer are used to connect to the hoists and accessories, the safety functions may in some cases be impeded.

Operation under such conditions, inappropriate use and non-observance of the listed operating and safety instructions are all prohibited!

In any such case, the product warranty will be null and void.

2 Introduction

Congratulations!

We congratulate you on the purchase of the MPC 4ID8 controller combined with the MRC 4/8/16/24/32ED8 remote control for the control of 3-phase rotary current drives with direct control in accordance with BGV D8 and D8 Plus / IGVW SQ P2.

These MOVEKET devices will impress you with their quality, functionality and safety!

Please read these Operating Instructions through carefully prior to first use.

Allow some time for this, in order to prevent malfunctions and supposed risks!

2.1 Function and use

The devices allow you specifically to operate 3-phase AC drives independently of one another in both directions. The MPC controller in connection with the MRC remote control satisfies the technical requirements for the control of lifting gear (for an explanation, see 'Safety instructions'). In the event of a fault, the motor protection circuit breakers perform a 3-phase shutdown and are subject to compulsory group use, which means that in the event of the failure or malfunction of one drive, the others drives are locked.

A control system invariably consists of at least one MPC controller (the power unit) and one MRC remote control (the remote control unit). The MPC controller contains the power and safety components for the phase changing controller of the 400 V AC drives. The MRC remote controls govern the MPC functions and allow remote operation.

The devices are used in trade fair, event, studio, production and entertainment venues as well as in tour applications to control 3-phase AC motors. The devices were primarily designed to control the lifting and lowering of suspended loads during setting-up and dismantling operations with the help of lifting gear (e.g. electric chain hoists or winches). Such loads include, for example, trusses as well as lighting, video and sound reinforcement equipment.

The MPC 4ID8 is designed for drives using 400 V AC rotary current direct control. Here the respective manufacturer's instructions must be observed.

It is to be noted that in the operation of each motor the individual total power consumption is assured and the motor protection circuit breaker should be adjusted accordingly. (see 'Technical data: Tripping value´).

3 CONTROL PANEL + DISPLAY

3.1 Off / On / Bypass switch

- Implemented as handle, optionally as key switch
- Central power-up of electronics, middle position of switch
- Bypass function as key function for the bridging of system states and therefore for targeted service runs such as e.g. underload runs and correction runs in the case of following errors in supervised group operation

3.2 LCD display

- Shows all operating statuses of the 4 motors

3.3 E-STOP (Emergency OFF) button

- Interrupts with immediate effect all run states of Motors 1 - 4 and all controllers linked via Easy Link or an I-Motion network
- Function-illuminated – flashing red when depressed
- When depressed, button can only be unlatched by turning

3.4 Function LEDs

- **Bypass**: Shows the bypass function, activated directly at the device by the Bypass switch or in network operation by means of an external controller
- **Traffic**: flashing - indicates functioning of the data network
- **CPU**: flashing - indicates functioning of internal CPU

3.5 GO button

- The GO button activates after a successful selection the current run command for all selected drives
- For the run to continue, the GO button must be permanently held down (dead-man function)
- When a run command has been selected using the motor selection switches and is possible, the GO button illuminates in green (Run command enabled)
- As soon as the Run command is activated with the GO button, this flashes to indicate the progress of the run

3.6 Motor selector switches 1 – 4

- These serve for the selection of the run direction and other function commands of the motor currently assigned to them

3.7 ESC key

- When pressed once, cancels all selected function or run commands
- When pressed twice in quick succession, it returns you to the Main menu from all sub menus

3.8 Menu key

- With the menu button you can select each sub menu in turn
- All sub menus are shown in the display

3.9 Rotary/push button encoder

- By rotating this to the left / right, you can set all function values in high resolution
- When the encoder is pressed from all sub menus, the input data is saved

IMPORTANT:

- Altered data must be stored before the current sub menu is left

3.10 Input keys UP / DOWN

- The input buttons serve to increment values in large steps in order to accelerate the entry of data from the sub menus

4 MENU NAVIGATION

4.1 Start Display

The MOVEKET MPC 4ID8 controller is a microcontroller-based digital controller with an integrated closed operating system. The operating system is launched as soon as the device is switched on with the OFF/ON switch.

The operating system boots up independently, whereupon the entire system undergoes a test routine before the device is enabled.

The process is underway when the MOVEKET logo appears on the display, and the time remaining as the software load proceeds is indicated by the left-to-right advance of the progress bar.

Please do not switch off the controller while this process is underway!

As soon as the software is loaded (after c. 10-15 seconds) and the test routine has completed successfully, the device switches automatically to the 'POWER ON TEST' menu. (see §2.2)

4.2 POWER ON TEST

The Power ON TEST menu shows the fundamental operating statuses of the device.

If all functions are positive subsequent to a successful power-up, the device switches automatically to the Main menu.

All positive operating states are indicated at the end by a 'tick'.

If the '**Power ON TEST'** menu persists in the display, this indicates the presence of a fault the nature of which will be indicated in the display output.

Before the controller can be operated, this fault must be remedied.

4.2.1 L1, L2 and L3

- The input voltage of the three phases
- If a phase is missing, this is interpreted as a fault
- In the case of under- or over-voltage, this is interpreted as a fault

4.2.2 Rot. field

- The rotating field of the input voltage; essential to the correct upward/downward movement of the drives
- An error in the rotating field is interpreted as a fault. In this case, please test the mains supply and if necessary adjust the rotating field at the phase-changing plug. To do this, use a medium-sized screwdriver, hold the CEE plug with the contacts facing you and, pressing lightly with the screwdriver, turn the red rotating phase-shifter, which is between the contacts, through 90° in the direction indicated

4.2.3 IO CPU-D8

- Indicates the status of the input/output CPU
- Indicates the type of the device and the safety standard (D8 or C1)

4.2.4 IT CPU

- Indicates the status of the network CPU

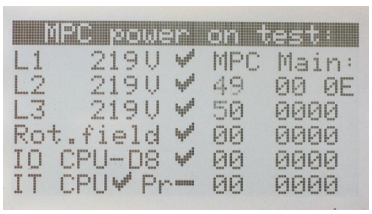
4.2.5 Pr

- Indicates the status of the program CPU

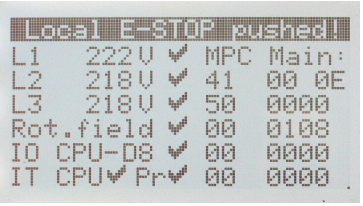
4.2.6 Values on the right

- These values indicate various digital states of the CPU and serve to allow later software versions to read and display further operating states

4.2.7 Menu after switching from the Start menu - the test procedure is underway



4.2.8 Menu when the local E-STOP button is pressed



4.3 Operating Main Menu

NB:

Prior to operation, it is imperative to check and enter the correct values in following sub menus: §2.5 MAX LIMITS / RESOLUTIONS, followed by §2.4 PROGRAMMABLE LIMITS, as it is in these sub menus that the basic parameters for the drives, what runs are permissible and their protections are defined. Unless this is done, no proper and safe operation of the entire system is possible.

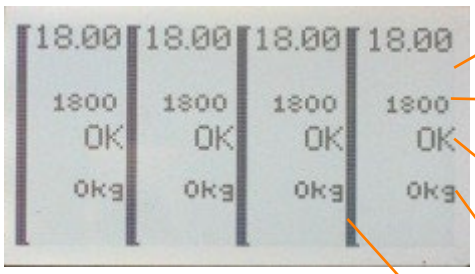
For this reason, please always open these sub menus and check, and if necessary adjust, all the values to match the drives and their performance characteristics as well as the project-specific input values.

Make sure prior to and during every run that you have an unobstructed view of all the drives in motion and are able to supervise them at all times!

Handling:

- After a successful positive self-test, the controller switches automatically to the Main menu
- Using selector switches 1 to 4, you can choose directly between UP, DOWN or OFF. The target values for the possible run directions selected are dealt with under §2.4 PROGRAMMABLE LIMITS' - values for software operating limits "Lower and Upper' in connection with the use of incremental or absolute encoders. If the encoder function is not activated (OFF in the sub menu), what results is a simple upward or downward run without limit points and without any kind of monitoring!!
- As soon as a run direction has been selected and is possible, the GO button lights green and the selected run can be initiated by pressing the GO button
- The GO button must be held down throughout the run (the 'dead man' function)
- The run direction can be reversed (from UP to DOWN) by pressing the same selector switch (1 to 4) a second time. Pressing this button a third time deactivates the selected drive.
- By pressing the ESC button, you can cancel all the selected run commands
- Pressing the selector switches in too rapid succession can result in the OK status being interrupted, as every run command has to be tested first before enabling. This is a safety routine, designed to avoid operating errors

4.3.1 Basic menu



1. Current position

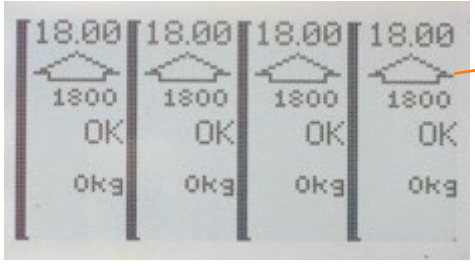
2. Target position

3. Status

4. Actual load

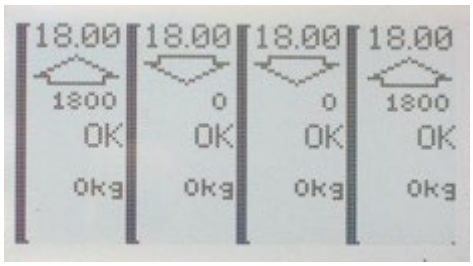
5.Progress bar showing current position relative to target.

4.3.2 Run direction selected = 'Lift' (Drives 1



6. Run direction selected

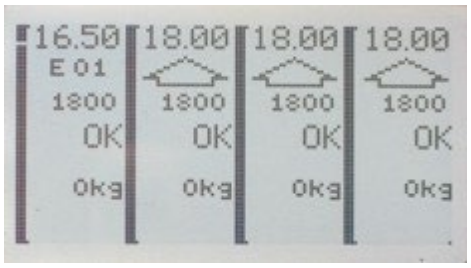
4.3.3 Run directions selected = 'Lift' (Drives 1 & 4), 'Lower' (Drives 2 & 3)



4.3.4 Status error 'OK' missing e.g. motor protection circuit breaker tripped, Link or I-Motion plug not plugged in (open Emergency OFF chain)

4.3.5 Run error 'EO1' - following error when lifting. Error triggered by run direction and speed monitoring. e.g.:

- I-encoder not or wrongly plugged in or broken cable
- Nominal speed entered incorrectly
- Drive overloaded; no longer reaches nominal speed



- The run may be resumed through the parallel release of Bypass and GO as a targeted emergency run!

WARNING:

Analyse clearly and remedy errors before continuing!

4.3.6 Run error 'EO2' - following error when LOWERING. Error triggered by run direction and speed monitoring e.g.:

- I-encoder not or wrongly plugged in or else cable broken
- Nominal speed entered incorrectly
- Drive overloaded: exceeds nominal speed

- The run may be resumed through the parallel release of Bypass and GO as a targeted emergency run!

WARNING:

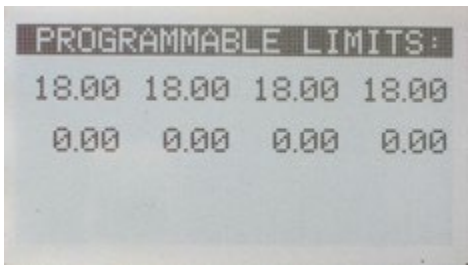
Analyse clearly and remedy errors before continuing!

4.4 PROGRAMMABLE LIMITS

- These values are only relevant in connection with drives equipped with incremental or absolute encoders to control their position
- It is a question here of software-monitored operating limits that define the application-determined run range, thereby providing a simple means of making targeted runs for lifting and lowering operations possible
- The input values have to be plausible, as otherwise the correct running of the drives is no longer possible
- Before inputting the '**PROGRAMMABLE LIMITS**', the '**MAX LIMITS/RESOLUTIONS**' (see §2.5) have to be entered
- The '**PROGRAMMABLE LIMITS**' selected must as a matter of principle lie within the MAX LIMITS and not overlap them

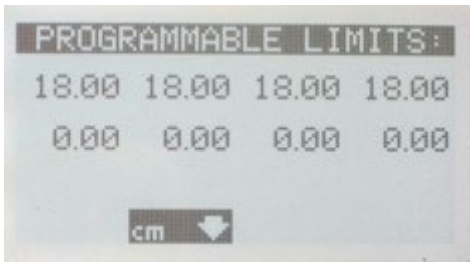
PROGRAMMABLE LIMITS				
Upper operating limit	18.00	18.00	18.00	18.00
Lower operating limit				
Input Window	Hoist 1	Hoist 2	Hoist 3	Hoist 4

4.4.1 Basic menu



4.4.2 Input of the upper operating limit of Drive No. 2

4.4.3 Input of the lower operating limit of Drive No. 2



4.4.4 Input of the entire range of Drive No. 2, both values are shifted in parallel

4.4.5 Teach-in function

Drive no. 2; if in this sub menu the UP arrow is pressed, the current position is interpreted as the upper operating limit; if the DOWN arrow is pressed, the current position is interpreted as the lower operating limit.

4.4.6 Direct input function

of the maximum run range, based on the MAX LIMITS (§2.5) values. The upper operating limit is entered using the UP arrow and the lower operating limit using the DOWN arrow.

4.4.7 To store all values entered in this sub menu, press the rotary/button encoder

4.5 MAX LIMITS / RESOLUTIONS

These values define the drives to be used and their operating parameters. Here, the data must be entered correctly and in full, otherwise proper and safe operation is impossible. Only with the right basic data can the controller assure and monitor the correct functioning of the system.

NB:

Please check these values every time a system is put into operation and ensure that the requisite data is entered in full!

MAX LIMITS / RESOLUTION				
Upper Limit	18.00	24.00	18.00	18.00
Lower Limit	0,00	-1,50	0,00	0.00
I-encoder resolution	7x22	off	11x31	2500
Nominal speed	420	off	1000	0
Input Window	Hoist 1	Hoist 2	Hoist 3	Hoist 4

4.5.1 Upper limit

- Defines the maximum extent of the run range upwards. It is best to enter the maximum chain length here. 0 – 99.00 Meter

4.5.2 Lower Limit

- Defines the definitive limit. This can also be negative, when for example the level of the stage represents the zero-metre mark but there are also hoists in front of the stage that need to be lowered beneath the level of the stage and therefore below the zero point. When entering this value, pay attention at all times to the maximum run range, which is the difference between the upper and lower limits

4.5.3 Incremental encoder resolution

- If drives without incremental encoders are used, this value should be set to 'OFF'
- When used with MOVEKET incremental encoders, the function extends to exact, reproducible positioning. For this, the input of the resolution of the increment steps per metre is decisive. The data is input in 'incr/m'
- MOVEKET hoists, here, are already pre-programmed and by means of the encoder can simply be selected by defining the chain type of the hoist e.g. MOVEKET Eco 1000 - Chain type 7 x 22 - Selection 7 x 22. To discover the chain type, either consult the specification plate or measure it using callipers, in which case the values to measure are the diameter of the chain (here: 7 mm) and the length of each link (22 mm)
- All usable chain types are pre-programmed
- For free drives equipped subsequently with a MOVEKET encoder, the possibility exists of calculating the values and then entering them directly in 'incr/m' using the encoder

4.5.4 Nominal speed

- In connection with the incremental encoder, the possibility exists of initiating active monitoring of the run direction, run state and run speed. For this purpose, the nominal speed of the drive in question must be entered in cm per minute
- The nominal speed of MOVEKET hoists is displayed in each case on the specification plate in metres per minute, so this value must be multiplied by 100 prior to input. Example: MOVEKET Eco 1000 nominal 4 m/min = 400 cm / min

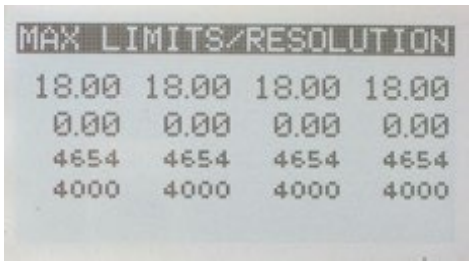
NB:

- An incorrectly entered speed value inevitably results in an error output of the controller, which interrupts the run of the connected drive. Drive error warning E01 or E02
- If no incremental encoder is connected while speed monitoring is activated or if there is a cable interruption, the controller registers an error and interrupts the run

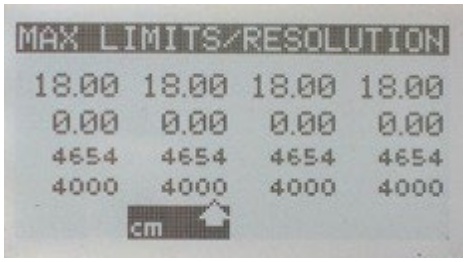
4.5.5 Input window

- The input windows relate to the current Drive 1 to4 and are selected by means of Buttons 1 to 4
- You can enter identical input functions for each drive or any variations you like
- The values are entered using the rotary encoder in fine increments or using the UP/DOWN buttons in large increments
- When the values have been correctly entered, they should be stored by pressing the encoder button before leaving this sub menu

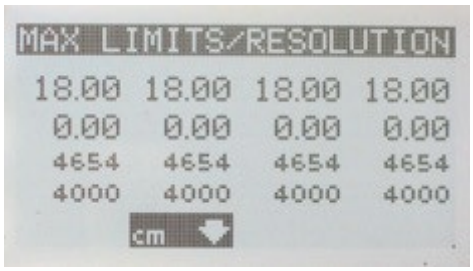
4.5.6 Basic menu



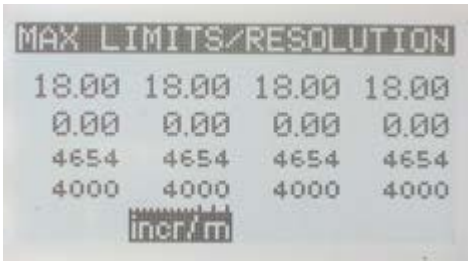
4.5.7 Input of the upper limit value for Drive No. 2



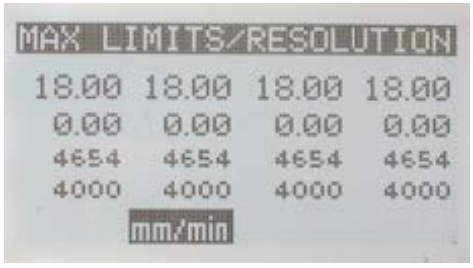
4.5.8 Input of the lower limit value for Drive No. 2



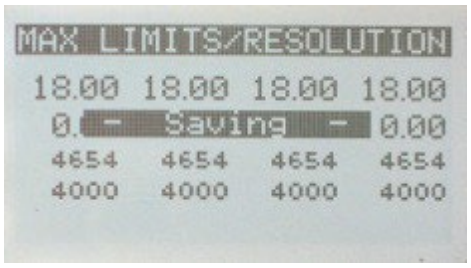
4.5.9 Input of the I-encoder resolution of Drive No. 2



4.5.10 Input nominal speed of drive No. 2



4.5.11 Saving the input values in the sub menu



4.6 REFERENCE POSiTIONS

- When using incremental encoders, the precise definition of the actual position is necessary prior to first use. This is because an incremental encoder counts from its reference point only the steps per revolution in relation to the run direction
- The data is input as usual using Buttons 1 to 4 to select the drive followed by the rotary/button encoder and/or the UP/DOWN arrows to enter the actual values

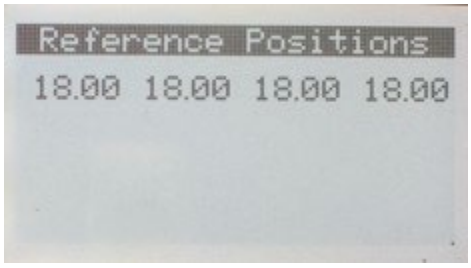
WARNING:

- It is necessary to enter correctly the reference position each time a new system configuration is put into use
- Once the reference position has been set successfully, never exchange the drives at the controller connector!

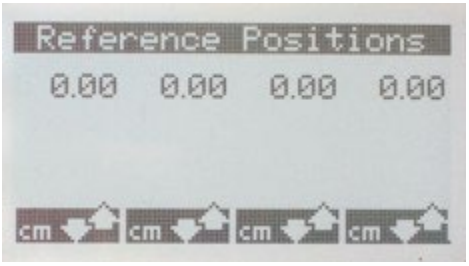
TIPS:

- Switch the positioning off to set up the hoist. Otherwise, it can happen that on account of incorrect and obsolete input values, a run is rendered impossible or can only be completed after numerous time-consuming adjustments
- If all the drives are hanging, run all chain ends to level 0.00 (the floor or the stage or hall). Now activate the positioning function §2.5, enter the correct chain type and go then to the Reference Positions menu and enter for all drives the value 0.00 and store them. In this way, all the drives can be set correctly in one go

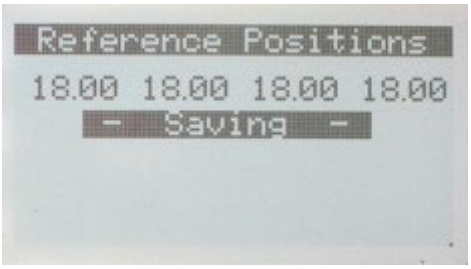
4.6.1 Basic menu



4.6.2 Selection of drives 1 to 4 for input



4.6.3 Press the rotary/button encoder to save before leaving the sub menu



4.7 LOAD MENU

LOAD MENU – ALL LOADS IN KG				
Nominal load / nom	1000	1000	250	off
Unladen weight / own	80	100	off	off
Overload / OL	580	1100	250	off
Underload / UL	off	100	off	off
Input Window	Hoist 1	Hoist 2	Hoist 3	Hoist 4

4.7.1 Nominal load

- Adjust as displayed on the specification plate of the hoist in kg
- Turn counter clockwise to choose from presets
- Turn clockwise the create individual values
- If there is no load measurement cell or bolt. turn to OFF

4.7.2 Own weight

- Adjust as displayed in the manual of the hoist in kg

4.7.3 Overload

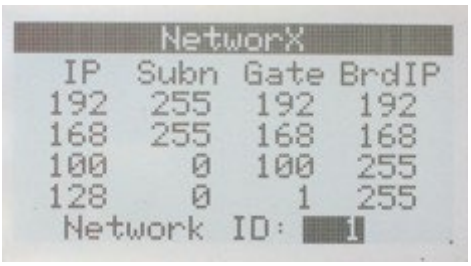
- Adjust the individual value according to safety reasons in kg
- Controller will stop automatically if the overload value is set under the value of nominal load
- If the overload should be the nominal load, select the same value

4.7.4 Underload

- Adjust the individual value according to safety reasons in kg

4.8 I-MOTION NETWORK

- This menu is used to set the start address for network operation in the I-Motion network. The input is performed using the rotary/button encoder in single steps and UP/DOWN buttons in steps of four
- To save the address, press the rotary/button encoder



4.9 MRC function

- As an alternative to operation using the front display, a standard MRC 4ED8 / 8ED8 or 12ED8 can be used
- This mode is activated using the MRC ON/OFF switch between the two Harting connectors on the rear panel of the controller. Function-illuminated - glows red when ON
- When MRC is activated, 'MRC4' appears on the display
- When MRC mode is activated, operation from the front input unit is no longer possible. Only the Emergency OFF and GO buttons continue to be functional
- As soon as a run command is selected via the MRC, this is indicated in the display by a full arrow for each selected drive
- If the drive is equipped with the I-encoder function and the controller setup programmed accordingly, target runs in the region of the programmed operating limits are possible also with the MRC. Monitoring of the nominal speed is also assured. Any error leads to the stopping of the drives

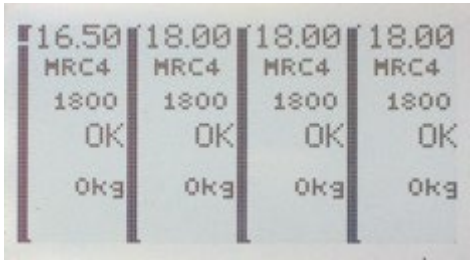
CAUTION:

- When MRC mode is activated, it is imperative that an MRC be connected, as here the Emergency OFF button of the MRC is integrated into the safety chain and monitored

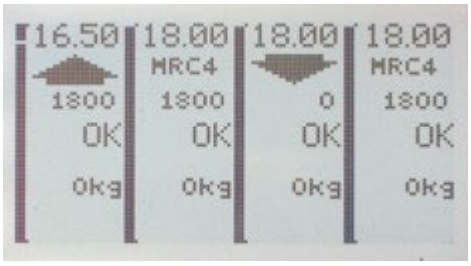
4.9.1 MRC ON/OFF switch - Status OFF

4.9.2 MRC ON/OFF switch - Status ON

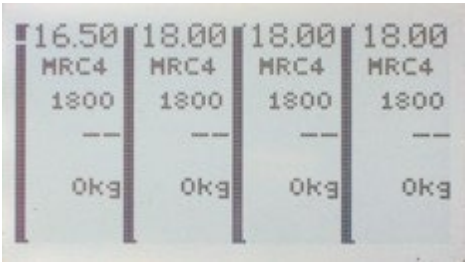
4.9.3 The display with MRC mode activated



4.9.4 The display with MRC mode activated and run direction UP selected for Drive No. 1 (current position: 18.00) and DOWN for Drive No. 3 (current position: 0.00)



4.9.5 Display with MRC mode activated and the Emergency OFF button depressed – all 'OK' statuses cleared – a run is no longer possible!



4.10 M-Link system

By connecting multiple MPC controllers (max. 8 units in one network), it is possible to control up to 64 drives simultaneously. The MPC controllers are linked to one another using Link cable (use MOVEKET Original Link Cable) via the Link sockets. The drives are selected using the remote controls of the MPC controllers in question; runs can be executed using the Go button of any of the MRC remote controls. Activating any GO button in the linked group activates runs by all the preselected hoists within the linked group.

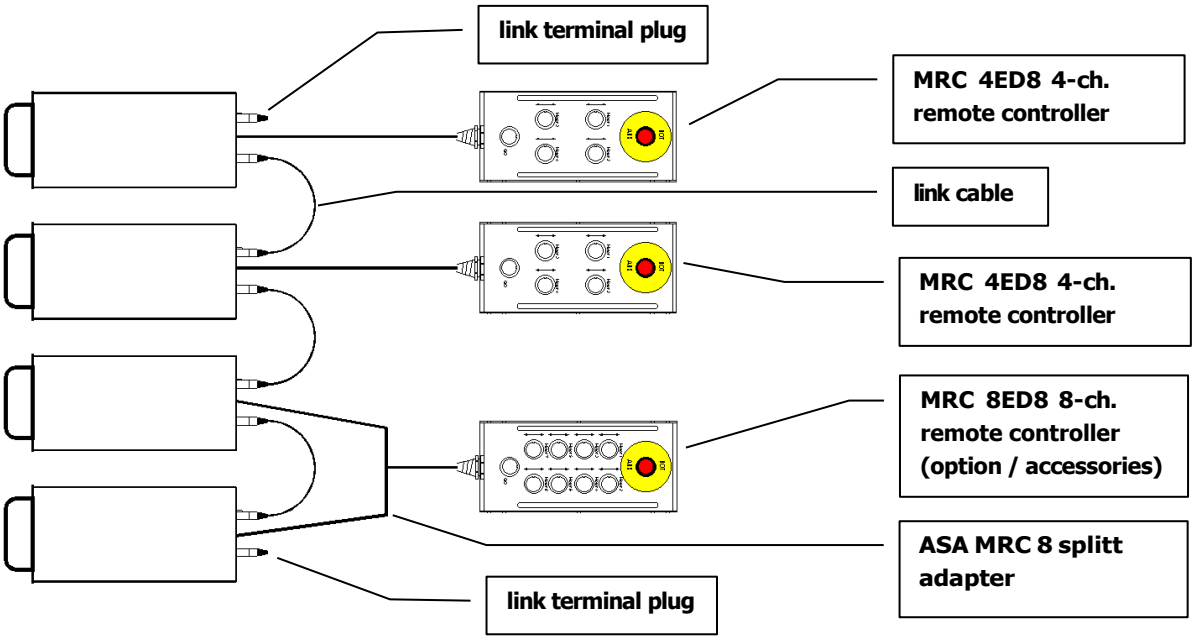
If an error occurs in the Link system e.g. as a result of the tripping of any of the motor protection circuit breakers or the pressing of any E-STOP button, all the run-active hoists in the entire linked system will stop (forced group shutdown).

Linking is performed by connecting the 7-pole socket of the first MPC controller to the 6-pole socket of the second MPC controller using the MOVEKET Link cable. The free sockets that result should be occupied by the Link terminal plugs of the first and last controllers in the chain, for this purpose the open Link system sockets should be closed off with the Link terminal plugs. Only in this way can the safety chain be closed and the entire system enabled – the GO/READY indicators of all the linked MRC controllers will then turn GREEN!

For technical safety reasons, no more than 8 MPC controllers can be connected together at one time.

The Link cable is available in various lengths.

The following graphic illustrates the structure:



4.11 Forbidden operations

The following operations are not permitted:

- Tipping (between consecutive run activations, a pause of at least 3 seconds is required)
- Turning individual drives on and off using their direction selectors in the course of a run
- Changing the run direction of drives with their direction selectors in the course of a run
- System operation of multiple MPC controllers without an active link system
- Removing or inserting plugs of any description in the course of a run
- Driving whilst unable to see the loads and the entire run path of all drives
- Moving loads over people's heads
- Scenic runs
- The transportation of people
- Use with lifting gear at speeds in excess of 10 m/min
- Operating outside the working conditions
- Use other than that intended and improper handling

5 Errors

As a fundamental rule, errors that require the controller or the remote control to be opened must not. and cannot, be eliminated by anyone other than authorized, skilled personnel.

If this rule is infringed, we cannot guarantee the safety of the device.

Therefore, in the case of more serious malfunctions or errors contact your nearest service centre!

CAUTION: THE DEVICE IS UNDER 400 V AC!

5.1 Errors or system failures in the course of operaion

MPC controllers dispose over an internal safety chain in which relevant errors within an interdependent group (group supervision) are monitored and evaluated. This means that any error invariably leads to the shutting down of all the drives. Before the system can be operated again it is invariably necessary therefore to eliminate the operating error. The same is true in Link mode with additional MPC controllers.

5.2 Operating errors

- Power supply undervoltage
- Rotary field errors (in the event of a phase error, the procedure to be followed is described under 'Power supply')
- Phase asymmetry
- Missing operating phase (L1, L2, L3) in the power supply
- Power switch in the OFF position
- Open safety chain e.g. link terminal plug not inserted or cable splitter not fully occupied.
- Tripping of any motor protection circuit breaker (In the event of a motor protection circuit breaker error, the procedure to be followed is described under 'motor protection circuit breakers')
- E-STOP (emergency stop) button depressed and latched

6 Inspection and maintenance

6.1 Inspections

The devices and accessories must be subjected to an annual UVV inspection by a specialist in the course of which the correct functioning of the safety systems and functions is tested in conjunction with the drives/hoists being used, The functioning, in particular, of the E-STOP button as well as the motor protection circuit breakers in both single and group modes (M-LINK) should be tested.

When used as mobile devices, annual inspections in accordance with BGV A3 (VDE 0701/0702) must be conducted and documented. Here, regulations and requirements specific to the country of use must be respected.

To ensure the fail-safe functioning of the RCD and the motor protection circuit breakers, their functionality should be tested regularly – ideally each time the system is used – by means of the Test button.

6.2 Maintenance instructions

he MPC controller and MRC remote control generally require no maintenance.

The housing should be cleaned by wiping it with a damp cloth using commercially available, mild, degreasing cleaning agents. Please do not use substances containing solvents.

7 Technical data

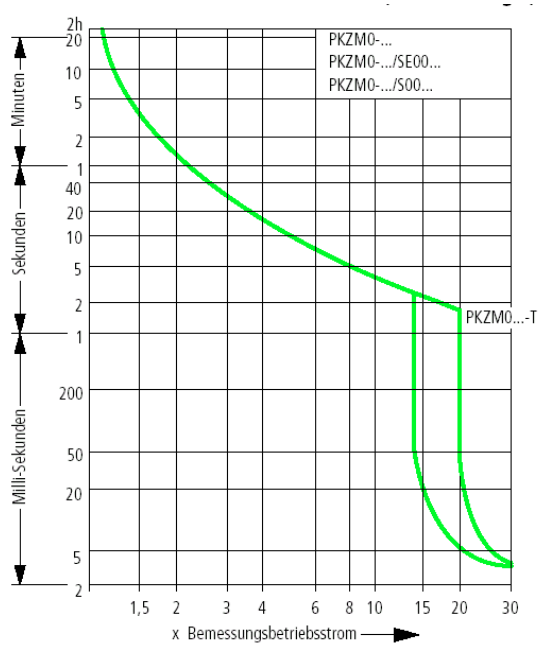
7.1 Technical data

Supply voltage:	400 V
Frequency:	50 Hz
Operation power consumtion:	depending on the motor 0,27 kW to 2,2 kW
Protection class:	IP 21
Connection:	16 A / 3-phase CEE 5p phase-changing plug (MPC 4 ID8-3)
	32 A / 3-phase CEE 5p phase-changing plug (MPC 4 ID8-4/5)
Weight:	16,4 kg (MPC 4ID8)
Dimensions:	Width: 19 inches or 44.5 cm
	Height: 3 U or 13 cm (MPC 4ID8
	Depth: c. 50 cm (in plugged state)
Temperature range /operation:	0° to + 40° C
Temperature range/ transportation:	- 20° to + 60° C

7.2 Setting the motor protection circuit breakers

The tripping value is set using the yellow setting screw on the motor protection circuit breaker in question.

Here attention must be paid to the setting values and maximum power consumption of the drives in use in each case (manufacturer's instructions).



Tripping characteristic of the motor protection circuit breakers

In principle, the setting range of commercially available motor protection circuit breakers is limited. It is essential to assure that the setting range accords with the rated current of the drives.

Currently a variety of MPC-E types are available:

MPC 4ID8-1 (setting range 1.0 to 1.6 A)

MPC 4ID8-2 (setting range 1.6 to 2.5 A)

MPC 4ID8-3 (setting range 2.5 to 4.0 A) standard device

MPC 4ID8-4 (setting range 4.0 to 6.3 A) HP standard device (high-power implementation)

MPC 4ID8-5 (setting range 6.3 to 10.0 A)

NB:

Three-phase drives often exhibit a high starting current when first switched on that can lead to the power supply pre-fuse tripping; for this reason, it is necessary to pay attention to the fuses used and the characteristic of the power circuit-breakers or safety elements.

7.3 Setting of the drives

To discover the rated current that should be set for the drive, consult the specification plate, the test book or the operating instructions.

Ideal protection is assured when the tripping current of the circuit breaker is identical to the rated current; values 25% higher than the rated current afford no reliable protection, whilst values lower than the rated current result in a shortening of the operation/duty cycle.

NB:

If the rated current of the drive is greater than the setting range of the motor protection circuit breaker, the operating/duty cycle will be reduced and this may also lead to the motor protection circuit breaker tripping immediately. This is not a malfunction!

7.4 Load output assignments (motor output multi-pin socket)

Number	**Motor-assignments**
1	1 - L1
2	1 - L2
3	1 - L3
4	2 - L1
5	2 - L2
6	2 - L3
7	nc
8	Nc
9	3 - L1
10	3 - L2
11	3 - L3
12	4 - L1
13	4 - L2
14	4 - L3
15	nc
16	nc
PE	PE (M 1- 4)

7.5 Control output assignments (remote control multi-pin socket)

C		B		A	
7	1	7	1	7	1
8	2	8	2	8	2
9	3	9	3	9	3
10	4	10	4	10	4
11	5	11	5	11	5
12	6	12	6	12	6

Use A

1	E-STOP	7	UB + 24 V
2	E-STOP	8	Motor 1 up
3	GO	9	Motor 1 down
4	Ready 24 V	10	Motor 2 up
5	Ready GND	11	Motor 2 down
6	nc	12	Motor 3 up

Use B

1	Motor 3 down	7	nc
2	Motor 4 up	8	nc
3	Motor 4 down	9	nc
4	nc	10	nc
5	nc	11	nc
6	nc	12	nc

Use C complete nc

* nc stands for „not connected“

8 Accessories

- Remote cable splitter
- Motor load cable splitter
- Load cable extensions of various lengths
- Motor cable extensions of various lengths
- Remote control cable extensions of various lengths
- Link cables of various lengths
- Transport cases

9 CE Declaration of Conformity

MOVEKET GmbH

Rudolf- Diesel-Straße 23

D-71154 Nufringen

This is to confirm that the devices listed below in their design and construction as well as the versions thereof that we have put into circulation correspond with the applicable regulations, standards, EC directives and norms listed below.

Designation:

MPC 4ID8, MPC 4ID8-HP, MRC 4/8/12/16ED8

Applicable EC directives:

42/2006/EG	Machinery Directive
2006/95/EG	Low Voltage Directive
2004/108/EG	EMC Directive
DIN EN ISO 13849-1	Safety of machinery – safety-related parts of control systems – Part 1: General principles for design

Applicable harmonized standards:

DIN EN 60204-32	Safety of machinery – Electrical equipment of machines - Part 32: Requirements for hoisting machines

National regulations:

BGV D8	Winches, lifting and pulling devices

Nationale standards:

igvw SQ P2	Chain hoists (supply and use of electric chain hoists in event engineering)

Alterations not approved by us deprive this declaration of its validity.

Nufringen, 10.01.2013

Andrew Abele

CEO / Geschäftsführer

10 Warranty

For devices and components manufactured by us, we offer a warranty of 24 months starting with the delivery or installation date: during such time we will repair defects of which we are informed in writing and that are substantiated or else provide suitable replacements.

No claims under the warranty shall exist in respect of damage caused by improper handling, the use of excessive force, induction or undervoltage, alterations or repairs conducted by the operator or user, or any external influences whatsoever.

For claims under the warranty, the device is to be returned unopened in the original packaging to the address given below, accompanied by a description of the apparent defect. A copy of the purchase invoice must be enclosed!

Wear attributable to normal operation is not covered by the warranty.

11 Service and support

Your responsible MOVEKET service support centre, dealer or distributor as well as the manufacturer

MOVEKET GmbH

Rudolf-Diesel-Straße 23

D-71154 Nufringen

Support: +49 9001-9851-77

E-Mail: support@moveket.de

www.moveket.de

12 Notes