

setting instruction MK5



**IFM CR1074 LED display programmed
as overload system MK5**

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General information

This document is part of the system provided by KST Engineering GmbH.
The documentation includes instructions for the CR1074 control console

The product identification

Product type:	IFM CR1074 Console
Product name of the software:	KST Engineering GmbH MK5 display
Firmware System:	Codesys 3.5.16.5 Package FW21015

document identification

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introduction

About this manual

This document is a component of the devices or software provided by KST Engineering GmbH. systems. Keep this manual in a safe place and ensure that it is freely accessible to all users.

Disclaimer

The contents of this manual are subject to change. KST Engineering GmbH makes no warranties for this material, including any warranties of merchantability or fitness for a particular purpose. KST Engineering GmbH assumes no liability for errors contained in this manual or for direct or indirect damages in connection with the provision or use of these materials.

Notes on copyright This manual is protected by copyright. All rights reserved. The manual may not be copied, reproduced or translated into another language without the prior written permission of KST Engineering GmbH.

use for the intended purpose

This device/system must only be used for the purpose specified in this manual. Any other use is considered inappropriate. The manufacturer assumes no liability for damage caused by inappropriate or unauthorized use.

This device/system may only be used if it is in perfect technical condition.

Qualifications of operating personnel This device/system may only be operated by appropriately qualified personnel, i.e. persons who:

1. are familiar with the operation or installation and commissioning
2. are familiar with the applicable legal provisions for the prevention of accidents
3. have read and understood the documentation or have received appropriate training or instruction received.

safety information

warning information and symbols

Information of particular importance is marked throughout the user manual using the following labels and symbols:



This symbol refers to hazards associated with the described activity that could result in injury.



This symbol indicates hazards that could cause property damage, such as damage to equipment or the environment.



The hand symbol indicates sections where you can find further information or tips.



This symbol alerts you to a possible voiding of the warranty. Make sure you read all safety instructions in this document and follow them when operating the system.

Make sure that you have read all safety information in this documentation and follow it when using the system.

Always keep these instructions in a safe place. Give a copy of the instructions to each operator.

The control system must only be operated with your hands. Never use sharp objects to press the buttons.

If the device is damaged, the system must no longer be used.

Disconnect it from the power supply. The limiter must be protected from steam, liquid and dust, especially if the display window is damaged.

Only clean the device with mild cleaning agents. Never use cleaning agents containing solvents or aggressive or abrasive agents.



When disposing of the limiter, the electronic components must be disposed of as hazardous waste in accordance with local regulations.

Purpose of use



This system has been designed in accordance with accepted safety standards. However, improper use of the equipment can result in injury or death to the operator and others, as well as damage to equipment and other property.

The system may only be used for its intended purpose and must be in perfect technical condition. There must be no doubt that this system contains electronic and mechanical components and therefore the risk of errors cannot be completely ruled out.

Errors that lead to a potential security risk must be corrected immediately.

This system is designed solely for the tasks described in this documentation. It must not be used for any other purpose.

Caution: This system is not intended to replace the operator's lack of practical experience or common sense in using the equipment. The entire operating procedure and all consequences arising from it rest solely with the operator.

The manufacturer assumes no liability for damage or injury resulting from inappropriate or unauthorized use of the system. The risk lies solely with the user.

General information

The SWG-1 system must be calibrated after system installation is complete, after machine changes, or each time an inaccuracy is detected. Calibration aligns the sensors installed in the machine.

Before beginning the calibration, you should read the entire procedure. The purpose of this manual is to provide the necessary calibration information before operating the system. For a description of the system and the console controls, refer to the Operator's Manual.

Warnings Always refer to

the crane manufacturer's operating instructions and load charts for specific instructions on crane operation and load limits.

However, the MK5 system is not, and should not be construed as, a substitute for the operator's common sense, experience and application of proper operating procedures.

The operator is responsible for operating the crane in accordance with the parameters specified by the manufacturer.

The machine operator must ensure that all warnings and instructions provided by the manufacturer are fully understood, observed and kept with the machine.

Before operating the crane, the operator must read the information contained in the operator's manual carefully read and understand to ensure that he is familiar with the operation and limitations of the MK5 system.



BEFORE STARTING THE MACHINE, THE SYSTEM MUST BE CALIBRATED. ALL STEPS MUST BE CARRIED OUT AND COMPLETED. TO AVOID EQUIPMENT DAMAGE AND SERIOUS OR EVEN FATAL ACCIDENTS, IT IS IMPORTANT THAT THE SYSTEM IS CORRECTLY ADJUSTED BEFORE STARTING TO USE THE MACHINE.

MAKE SURE ALL SETTINGS/DATA HAVE BEEN ENTERED CORRECTLY!

Commissioning Before you

start using the device, make sure that you have read all relevant instructions provided by the device manufacturer regarding the updating and use of the devices.



This manual and the equipment manufacturer's manuals must be read carefully and fully understood before starting work.



All entries must be made in accordance with the actual conditions of the equipment. If incorrect entries are made, the equipment may not function properly and may not provide the necessary protection for the operator or equipment in hazardous situations.

Before making any changes to the system, always check the sensor and power cable.

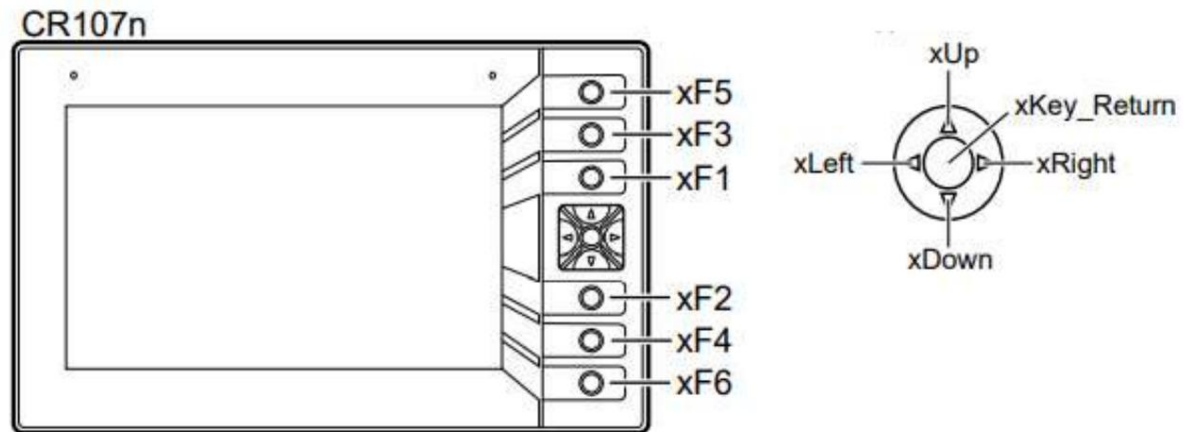
The system may only be adjusted by KST Engineering GmbH customer service or an authorized KST representative. Incorrect adjustment may result in inaccurate data or malfunction of the device. In this case, all warranties will be void.

The function keys

The display is controlled using the function keys F1-F6. The exact functions of the function keys are explained in the [Displays](#) chapter. The navigation key is used in the submenus and settings.

Function keys:

cross rocker:



System Settings & Password

1. After starting the system, press the Menu button 2. Press the User button to enter the user input 3. Select the user Admin, enter the password 28628
4. The lock symbol turns green when the code is entered correctly.



Service only enables the calibration of the sensors. Pressure curve editing is reserved exclusively for the admin (service password = 45259)

Now go back to the main menu where a new menu item will appear "Settings"

Settings

settings menu



WHEN STARTING THE DEVICE, START WITH POINT 1, THEN 2, AND FINALLY 3

Menu items:

1. Sensor adjustment = Here only the sensors are calibrated / adjusted (length, angle, load)
2. Calibration = Here the pressure curves are recorded and processed, furthermore Settings such as radius correction, deflection, area ratio are set.
3. Backup = All system-relevant data is read out or imported here.
(commissioning data, data logger, system text file)

sensor calibration

When calibrating the sensor, you must select the sensor you want to calibrate. Our recommendation is the following sequence:

1. Angle adjustment
2. Length adjustment

Angle encoder

There are 2 calibration routines for the angle encoder. The first routine for angle encoders is with a linear output signal $0-90^\circ=4-20\text{mA}$. The other routine is for our in-house angle encoder (SIC).

This has a cosine-shaped output signal $0-90 = \text{Cos}(4-20\text{mA})$. The display automatically selects which angle sensor is adjusted by configuring the central unit.

angle sensor Normal

1. Set the boom to the angle shown in the display. Measure

Check the position of the boom using an electronic spirit level.



2. When you have checked the angle, press the button



Now the "OK" sign

in the display "Green". This is the confirmation that the minimum angle has been adjusted. to move on to

3. Now press the button



the next adjustment point.



4. Set the boom to the angle shown in the display. Measure

Check the position of the boom using an electronic spirit level.

5. When you have checked the angle, press the button



Now the "OK" sign

in the display "Green". This is the confirmation that the maximum angle has been adjusted.

6. Now use the Return button to go back to the adjustment menu

Shopkeeper SIC



THE ANGLE SENSOR MUST BE MOUNTED AS FOLLOWS:

IF THE BOOM IS AT 40° THE PLUG OF THE SIC MUST BE PLACED VERTICALLY DOWNWARDS
SHOW

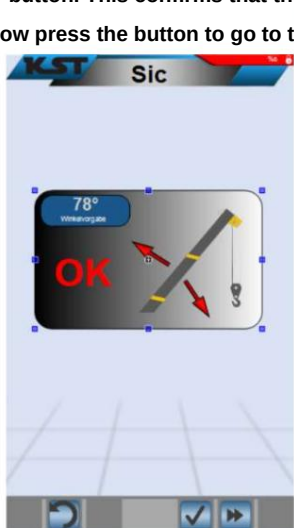
1. Set the boom to 40°, this position is the 0 point position for the SIC. Measure the position on the boom with an electronic spirit level.



2. Set the boom to the angle shown in the display. If you
Once you have checked the angle, press the "Green"
button. This confirms that the angle has been adjusted.
3. Now press the button to go to the next adjustment point.



Now the "OK" sign will appear in the display



4. Set the boom to the angle shown in the display. If you
Angle checked press the button
This confirms that the minimum angle has been adjusted.
5. Now press the button to go to the next adjustment point.



Now the "OK" sign in the display turns green.



7. Set the boom to the angle shown on the display. Measure the position on the boom using an electronic spirit level.

8. When you have checked the angle, press the button



Now the “OK” sign

in the display “Green”. This is the confirmation that the angle is adjusted.

9. Now use the Return button to go back to the adjustment menu

length sensor

There are two calibration routines for the length sensor. The first is for the length sensor (normal operation) and the second calibration routine is for the second length sensor if one is installed. The second length sensor calibration routine is only enabled if the second length sensor is programmed in the central unit. Since this does not correspond to the standard crane, this menu item can be ignored.

length sensor

1. Retract the boom completely so that the smallest length of the boom is reached can. Here in the picture the smallest length would be 11.4m



2. When you have reached the smallest length, press the button 

Now the OK sign turns green and shows you that you have matched the smallest length have.

3. Now press the button  to adjust the maximum boom length.



4. Now extend the boom to the maximum length. The specifications in the picture above would be 43.4m
When you have reached the maximum length, press the green button to show  and the OK sign is you that you have reached the maximum length.
5. Now use the Return button to go back to the calibration menu.

calibration

The calibration menu contains menu items for setting the load display and correction parameters.

After you have calibrated the sensors, you must now put the load display into operation.

To do this, go to the service area and select the menu item Calibration.



In the calibration menu you will find the following parameters

1. Compensation
2. Deflection
3. Pressure curves
- 4th correction

order of commissioning

1. First of all, the pressure curves are recorded
2. Then the compensation is set
3. The deflection corrects the radius/outreach
4. Correction of the load display

Pressure curve recording The

pressure values from the crane are recorded in the pressure curve recording. To do this, you must tilt the crane from 0° to 90°. First without a load on the hook, then with a defined test weight.



It is important to ensure that you know the test weight exactly. A deviation in the test weight affects the accuracy of the load display.

LG.Soll = Length specification of the boom

LG.Ist = Current length

Pres = Pressure indication in the lower chamber

Shop = Current boom angle

Program = Specifies which program is running is taken.

Hook weight = the current hook weight is specified here Test weight =

input of the current test weight Pressure curve = input of the length for calibration Play button = starts recording the pressure curve Del = deletes the pressure curve pair Cal1 = saves the pressure curves Cal2 = calculates the load from the pressure curves

Check mark = Send the pressure curves to the memory

Return key = Exits the pressure curve recording

The fields marked in red indicate errors in the current crane configuration.

"LG.Ist" is red because the current length does not match the specified length.

Once you meet the length requirement, "LG.Is Blue.

Now you have to enter the hook weight. To do this, use the control pad to navigate to the "Hook weight" button and enter the weight of your hook (in tons). As soon as you confirm the entry, the "Hook weight" button turns blue and the "Play" button is released.

There are checkboxes in the display. These show you how long you have already started using the device. (Empty box means no recording/checkbox means recording saved)

In the Length 1 line there are 3 checkboxes. The first always indicates the empty curve. The second box indicates the load curve and the third box shows you whether you have calculated the pressure curves. The numbers next to the boxes indicate the pressure curve number, which you can select with the Pressure Curves button.

recording

The procedure for recording the pressure curve is as follows:

1. Enter the program you want to run.
2. Set the boom to 0° and move the boom length to the specified length 3. Enter the hook weight 4. Select the empty curve for the smallest length
(Length 1 = Min/Length 5 = Max)
 - First box in the rows is always the empty curve
 - The second box is always the load curve
 - The third box is always the indication that the pressure curve has been calculated and the length is finished.
5. Press the play button 6. Slowly and evenly rock the boom up without stopping and setting the load down. If possible, make sure that the hook always remains at eye level.
7. When you have reached the steepest angle, stop the pressure curve recording by pressing the Stop button. 8. Press the CAL1 button to save the pressure curve.
9. Now select the pressure curve 2 (load curve)
10. Now enter a test weight by pressing the "Test weight" button.
11. Attach the defined weight and lower the boom as low as possible

Important: The test weight must be selected so that the crane does not tip over. You must design your test weight 30% behind the last load capacity value if possible. Therefore, the test weight should be as large as possible and as small as necessary. The test weight must not come into contact with the ground.
12. Start the pressure curve recording with the Play button.
13. Slowly and evenly lift the boom without stopping and putting the load down. If possible, make sure that the weight always remains at eye level. 14. When you have reached the steepest angle, stop the pressure curve recording by pressing the stop button.
15. Press the CAL1 button to save the pressure curve.
16. Now press CAL2 to calculate the load
17. Finally, press the check button to save the calculation

Repeat these 17 steps for each length. As soon as you have checked all the boxes, the pressure curve recording is finished and you can leave this menu item.

Attention: Switching off the crane will result in data loss. As long as you have not carried out step 17, the commissioning data will be lost.

Do not turn off the crane when recording the pressure curve!!!!!!

Compensation

In the compensation menu you can set the load difference which results from rocking up and down



To do this, press the Ratio button, which will now turn green. Now you can use the arrow keys to set the ratio until the load display no longer shows a difference when the boom is slowly rocked.



Move the boom slowly 2° up and then down again. If the load remains the same, you have the correct ratio.

The "Boom Up" button corrects the load deviation when bobbing quickly. To do this, you must select the button and use the arrow keys to correct the value up or down.

The "Boom Down" button corrects the rapid downward movement and is set as usual.

Radius Correction & Deflection

The deflection corrects the crane's reach. When a load is lifted, the boom bends and the reach increases. This is set in the deflection menu.



Radius Offset You

can use the radius correction to correct the projection if it always deviates by the same amount across the entire working area. To do this, compare the current projection on the hook with the radius in the display.

deflection

1. First press the Delete key to delete old entries.
2. With unloaded hook, telescopic main boom at maximum length and boom at 50° place.
3. Compare the crane reach with the radius in the display and enter the Difference in meters.
4. Now hang a test weight on the hook without changing the position of the boom.
5. Now measure the difference between the crane's radius and the indicated radius and enter this in the field "Radius Offset with last".
6. Now enter your test weight with which you measured the radius difference.
7. Now press the button with the hook and the values will be saved and calculated

Correction In

the Correction menu, you can correct the load display. The correction is only possible with the currently set program.

AKT.Last	= Current Load
LG. Ist	= Current length
LG. Soll	= length specification
Pres	= Current pressure
Shop	= Current boom angle
pressure curve	= Selection of which pressure curve is processed should be. 1,3,5,7,9 Learning curves 2,4,6,8,10 Load curve
Start Shop	= starting angle of the correction
Stop Shop	= final angle of the correction
Increment	= load correction factor
Crochet Taste	= Permanently save pressure curves
Save button	= Accept pressure curve change

To correct the load display you must select a pressure curve which you want to edit.

Move the boom to the specified length. Now rock the boom in the area where the load display deviates significantly from the actual weight. Now set the start and stop angle to the angle value where the load begins to drift. Now you can correct the load display with the increment.

You can do this for each load deviation to correct the load display. Once all values have been corrected, you can accept the jerk values using the save button and save them permanently using the check mark button.

Date & Time Setting

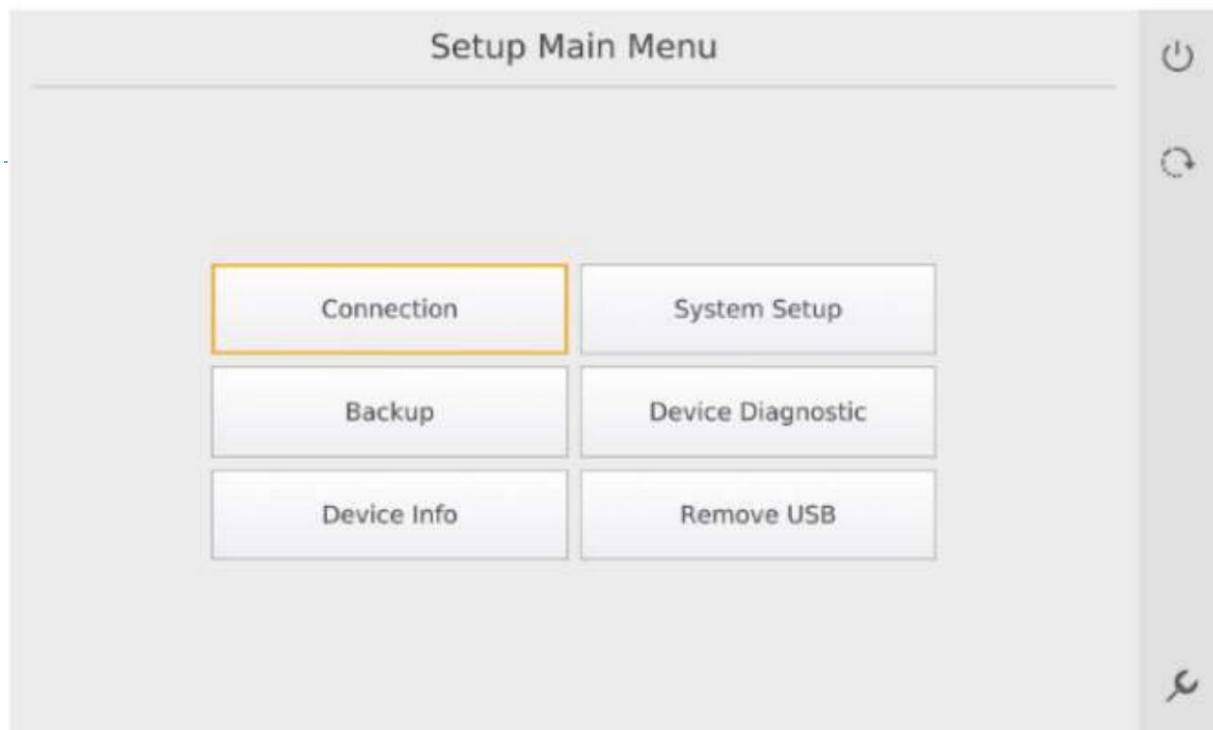
Setup mode start



ONLY MAKE THE CHANGES TO THE SYSTEM SETUP AS DESCRIBED HERE. ADJUSTING THE DISPLAY MAY CAUSE SYSTEM FAILURE.

Disconnect the device from the power supply. u Perform the following actions simultaneously:

Press and hold any two buttons on the device at the same time. Switch on the device. The device will restart. In the menu, select the "Launch Setup" button and confirm. The device is in setup mode.



set time zone

To set the date and time (system time):

Navigationspfad: [Launch Setup] > [System Setup] > [Date and Time] > Registerkarte [Time Zone]

Menu page shows the following information

[Time Zone Category] Preselection of the time zone region. The selection of a region acts as a filter on the

List e.g. All, America, Asia, Australia, Europe, US Time

[Time Zone]

zone e.g. US/Michigan, Europe/London, Europe/Berlin

Set date and time

To set the date and time (system time):

Navigationspfad: [Launch Setup] > [System Setup] > [Date and Time] > Registerkarte [System Time]

Menu page shows the following information:

[Year]	year 2000 ... 2100
[Month]	month 1 ... 12
[Day]	Tag 1 ... 31
[Hour]	Hour 0 ... 23
[Min]	Minute 0 ... 59
[Sec]	0 ... 59 seconds
[Time Zone]	time zone list

Select the desired number field. The marked number field has a black frame. u Use [y] / [y] to set the desired value.

When you leave the page the changes will be saved.

[illegible]



A series of horizontal lines for writing, consisting of 24 lines.