

Customer	PT Krakatau Bandar Samudera
Plant	Portalink 1300 / 90 RK
Place	Banten
Country	Indonesia
Project	KBS01_19
SD number	3018511374

KBS01_19

Operation manual

Release	Date	Author	Reviewer
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1 Introduction

1.1 Purpose

This chapter deals with the actual operation of the plant control system. It is aimed to help the user to operate the plant in a safe and efficient way, and to make full use of its possibilities.

1.2 Use of this document

The chapter 'Operating' has been designed so that the user can proceed logically through the individual sections while being introduced to the subject.

No screen masks are represented in this chapter. It is assumed that the operation personnel will be directly at the monitor whilst working through this chapter.

2 System Overview

2.1 Structure of the Plant and the Process

These details are found in the document '[Technical Specifications \[3\]](#)' in the section 'Plant/Process'.

2.2 Hardware Structure Plant Control

These details are found in the document '[Technical Specifications \[3\]](#)' in the sections 'Control Level', 'Process Control Level' and 'DP' Level'.

2.3 Functional Structure

Ref. Electrical equipment location plan
Motor- and Electrical equipment list

3 Operation Modes

The plant is operated from the radio remote control unit (VP1-A011CU), from the cable control or from the emergency panel near the hydraulic unit.

With the Operator panel TP 1900 the following functions may be executed:

- Shown of plant status
- Start and stop of motors
- Acknowledgement of faults or muting of horns.

Operation is described in detail in the description of the individual plant sections.

3.1 Automatic Operation

Operating modes of the individual sections:

Ship unloader	Operation by Radio remote control unit or cable control
Barge loader	Local control unit

Local Mode:

This operation mode is used to service the different units (motors, etc.) provided with a Service local control panel.

The operating modes of the individual sections are selected by means of the key on the control panel. The table is split into the following sections:

3.1.1 Start of Automatic Operation

Pushing the appropriate button may now start the normal operation function of this machine.

3.1.2 Ready for Manoeuvring (boom, slewing, kick)

The following procedure has to be done to put the unloader into operation:

- | | |
|--------------------------|-------------|
| - 1. Control power | : on |
| - 2. Operation mode | : automatic |
| - 3. Hydraulic unit | : started |
| - 4. Slewing gear anchor | : unlocked |

once, these operating have been carried out, the unloader is ready for manoeuvring.

The unloader can be positioned on the quay and the HL - SKT can be brought into the ship's hold.

3.2 General start condition for “Sequence Start”

1. Start System
 - See [chapter 5.1](#)
2. Ensure that
 - Compressor unit is started.
See [chapter 9.2](#)
 - Hydraulic unit is started
See [chapter 9.4](#)
 - Silo is ready or Barge Selected
See [chapter 9.17](#)
 - Transport system to silo is switched on.
 - System and hydraulic unit are started.
Oil Temperature is not higher than 75°C and not lower than 15°C
 - No errors are indicated on the operating panel.
 - “Service Mode” is inactive.
3. Turning into working position
 - Unlock slewing gear's storm anchorage bolt.
See [chapter 9.8](#)
 - Boom highest working position not reached.
See [chapter 9.5](#)
4. Starting all machines
 - Press “Start Warning” with radio remote control or Operating panel.
Horn warning sounds for 20 seconds.
 - Confirm “Start sequence”
Diverter Box turn in the right Position.
Automatic lifting of Barge loading spout is activated.(only by select Barge)
 - All necessary conveying elements will starting now
 - Aspiration will starting now
5. Start HL-SKT
 - Press “HL-SKT On” with radio remote control or Operating panel.

3.3 Operation

- As soon as the sequence start is finished the HL - SKT - chain can be started either on the operator's console or by the radio remote control unit.
- The SINK IN AUTOMATIC can be switched on after the unloading operation has started.

The HL - SKT sinks automatically into the free-flowing product, if the automatic sink in is active.

The sink in depth is limited by two level indicators HY2 – B10HL/B11HL on the HL - SKT boot

The sink in automatic should be used always when the HL - SKT is working.

- The hydraulic cylinders, i.e. for the boom luffing and the kick in / kick out movements, are put on the so-called "floating cushion" which enables the system to move slowly in both directions. In this way the structural steelwork of the unloader is protected from the stresses transmitted from the HL - SKT boot buried in the product.
In addition, this permits the unloader supervisor to keep an eye on the condition of the product (quality, impurities), as well as the functioning of the individual plant items without having to effect the respective manoeuvring, which means optimised utilisation of the unloader.
- In case of a fault at the aspiration system during start-up as well as during operation, the start-up-procedure or the unloading-operation will not be stopped, only an acoustic alarm will be given and the necessary aspiration element will be stopped.
After recovering of the fault at the aspiration system it can be restarted during unloading while pressing the push button for sequence start again.

3.4 Sequence stop

1. Confirm "Sequence Stop"
 - HL-SKT is stopped directly
 - The Line Status switched to "Cleaning"
 - All chain conveyor runs empty
2. After (60 sec) cleaning time
 - The Line Status switched to "Stopping"
 - All chain conveyor switched off
 - The Aspiration fan stopped delayed (approx. 60sec. depends the actual setting)
3. All Chain conveyor stopped
 - The Line Status switched to (Ready)
 - Filter control unit (delay appr.10 min. - please not switch off before delay time empty)
4. Now its possible select a new way and start again.

The sequence stop of the unloader is done in the reverse of the start sequence, however the HL
- SKT chain has to be stopped first.

3.5 Maintenance Switches

CAUTION : They are not for plant operation, but for maintenance purposes only.

The maintenance switch for one direction of rotation has the positions

START - MAN - 0 - AUT

Maintenance switches are mounted locally at the individual drives and are used for maintenance only.

The maintenance switch for two directions of rotation has the positions

AUT - MAN - START - 0 - START - MAN - AUT

The START position directly switches the contactor of the drive. The switch returns freely into MAN position when released.

To start and stop the drive locally, start and stop pushbuttons are provided.

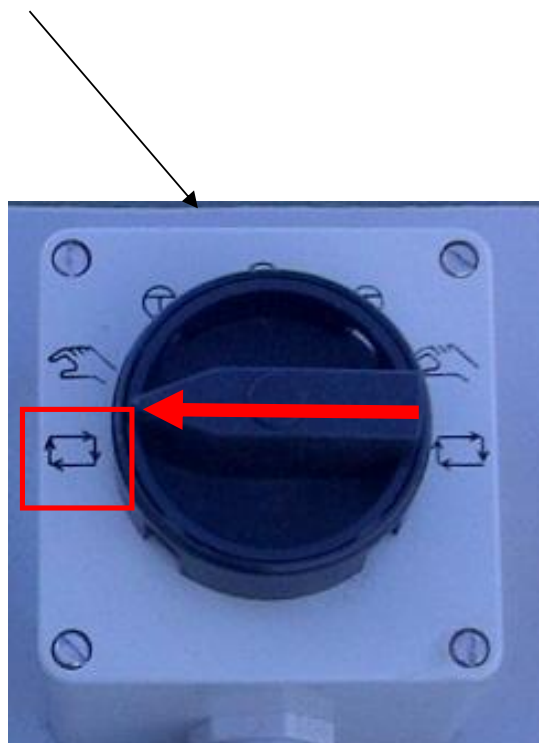
During maintenance work the maintenance switch is switched to 0 positions and for safety reasons must be locked by padlock.

(MAN = Manual / AUT = Automatic mode / 0 = OFF)

!!! No safety interlocks are active !!!

The position of the maintenance switch is not displayed.

During normal operation the switch must be in AUT position.



3.6 Emergency Stop Button

The whole plant control system consists of only one emergency zone.

In case of an activated Emergency Stop Button all running plant sections in this emergency zone may be immediately stopped. The control lamp "Control Power" on the control panel (indicating the presence of the control voltages) has still a steady light. After resetting of the activated Emergency Stop Button the emergency zone has to be reactivated by the control power switch (see also [chapter 5.1](#)).

The running plant may be immediately stopped by means of an Emergency Stop Button.

!!! The Emergency Stop Button used only in an emergency situation !!!



4 Alarm Handling

4.1 Display of Alarms

4.1.1 General

For each motor, device and apparatus of the plant, a maximum of one alarm information is generated and displayed on two video screens independent of the alarm situation (see also paragraph 5.5 "Fault Reasons").

4.1.2 Acoustic

As soon as a fault is detected a horn is switched on.

The alarm horns and buzzer can be stopped by pressing the "HORN RESET" button.

If an error happens the elements will stop according to the interlocking sequence. Restart is possible only if the error has been cleared.

4.2 General Sequence after a Fault Detection

- Fault detected

If required the PLC stops all material feeding elements from the faulty element backwards to the material source. The equipment after the faulty element continues to run by push "sequence start" again.

The operator is responsible for stopping further elements.

- Fault is indicated
- Mute horn
- Find the fault
- Fix the fault
- If required, restart or reset devices
- **Check that no persons are at risk when the section is restarted**
- Acknowledge the fault on the plant control system

4.3 Trouble-Shooting

- Identify the faulty equipment by means of the mimic panel
- Find the faulty equipment in the drawing by means of its identification
- Analyse the function group belonging to the equipment (i.e. which contactor, which PLC input/output, etc. belongs to this motor)
- Check if PLC controls the equipment (LED at PLC output module)
- Check if feedback signal is available at PLC input (LED at PLC input module)
- Analyse control circuit

4.4 Acknowledgements

1. Mute Horn

The horn may be turned off by means of the "Horn Reset" Key on the operator board. By acknowledging a fault on the operator panel, the fault is acknowledged and the horn is also turned off.

The horn is automatically turned off after a predefined time providing there is no earlier acknowledgement.

Muting the horn does not cancel the optical fault presentation. This means the appropriate elements continue to remain red, or flashes.

2. Acknowledgement of fault

Independent of the cause of a fault, all detected faults must be acknowledged by pressing the "Fault Reset button on the Operation Panel" 

Reactions to acknowledgement of fault:

- Automatic Mode in the plant sections: The stopped elements are not automatically restarted by the PLC. The system has to be restarted in automatic mode.

4.5 Fault Reasons

af : after fault elimination

Device, Apparatus	possible reasons for a fault indication
Motor, Mains supply	- Maintenance switch in wrong position - Safety switch in off position - Hard-wired safety interlocking prevents start - Mains supply to PLC missing - Circuit breaker of control power supply or PLC is switched off
- Contactor tripped because of	- short circuit - overload - phase fault
==> af: switch contactor on	
- Thermistor protection relay, thermal relay or thermal sensors released because of	- phase fault - overload - excessive ambient temperature - malfunction of motor cooling
==> af: push reset button if no automatic reset	
- Faulty PLC I/O-module	
- Faulty interface relay	
- Faulty contactor	
- Broken wire	
Temperature monitor	- Measured value out of tolerance
Pressure monitor	- Mechanical fault (i.e. sensor faulty)
Level probe	- Circuit breaker switched off
Speed monitor	- Signal conditioner faulty
Standstill monitor	- Faulty PLC I/O module
Apparatus in general	- Faulty apparatus (check built-in fuses) - Circuit breakers switched off - Faulty PLC I/O module - Broken wire

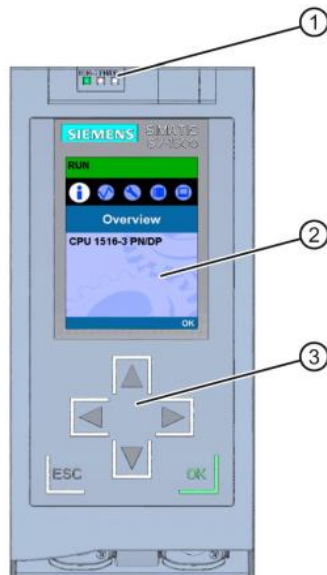
4.5.1 General Reasons for Disturbances

The following factors may reduce the reliability of the plant:

- Use of non-shielded cables where shielded cables are required
- Incorrectly connected shields
- Power supply cables and control cables not adequately separated
- Improper connections of cables (i.e. screws not tight enough)
- Nearby equipment using frequency converters or large motors
- Fluctuations in mains supply, supply voltage drops outside specified tolerance.

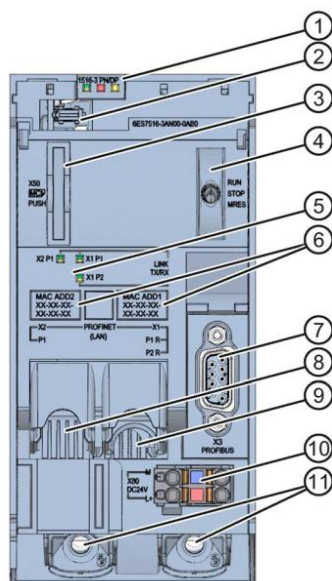
4.5.2 General Hints

When a fault on the PLC is detected and for any replacements of PLC parts, consult the appropriate manual of the supplier.



- ① LEDs for the current operating mode and diagnostics status of the CPU
- ② Display
- ③ Operator control buttons

If the PLC is on STOP (written on display or yellow LED on CPU board), the PLC can possibly be restarted by switching the "Mode Selector switch" (4) of the CPU board first to "STOP" and afterwards to "RUN".



- ① LEDs for the current operating mode and diagnostic status of the CPU
- ② Display connector
- ③ Slot for the SIMATIC memory card
- ④ Mode selector
- ⑤ LEDs for the 3 ports of the PROFINET interfaces X1 and X2
- ⑥ MAC addresses of the interfaces
- ⑦ PROFIBUS interface (X3)
- ⑧ PROFINET IO interface (X2) with 1 port
- ⑨ PROFINET IO interface (X1) with 2 ports
- ⑩ Connector for power supply
- ⑪ Fixing screws

Settings	Meaning	Explanation
RUN	RUN mode	The CPU executes the user program.
STOP	STOP mode	The CPU does not execute the user program.
MRES	Memory reset	Mode selector setting with pushbutton function for PLC memory reset.

!!! Do not use MRES then all equipment parameter will be deleted !!!

RUN/STOP LED	ERROR LED	MAINT LED	Meaning
 LED off	 LED off	 LED off	Missing or insufficient power supply on the CPU.
 LED off	 LED flashes red	 LED off	An error has occurred.
 LED lit green	 LED off	 LED off	CPU is in RUN mode.
 LED lit green	 LED flashes red	 LED off	A diagnostics event is pending.
 LED lit green	 LED off	 LED lit yellow	Maintenance demanded for the plant. The affected hardware must be checked/replaced within a short period of time.
			Active Force job
			PROFenergy pause
 LED lit green	 LED off	 LED flashes yellow	Maintenance required for the plant. The affected hardware must be checked/replaced within a foreseeable period of time.
			Bad configuration
 LED lit yellow	 LED off	 LED flashes yellow	Firmware update successfully completed.
 LED lit yellow	 LED off	 LED off	CPU is in STOP mode.
 LED lit yellow	 LED flashes red	 LED flashes yellow	The program on the SIMATIC memory card is causing an error.
			CPU defective
 LED flashes yellow	 LED off	 LED off	CPU is performing internal activities during STOP, e.g. startup after STOP.
			Download of the user program from the SIMATIC memory card
 LED flashes yellow/green	 LED off	 LED off	Startup (transition from RUN → STOP)
 LED flashes yellow/green	 LED flashes red	 LED flashes yellow	Startup (CPU booting)
			Test of LEDs during startup, inserting a module.
			LED flashing test

5 Turning the Plant Control System ON/OFF

5.1 Turning the Plant Control System ON

- Check that no persons may be injured by rotating parts when plant control system is turned on.
- Check that the plant is electrically and mechanically in operational condition.
- Unlock all Emergency Stop Buttons.
- Switch all maintenance switches to the desired position.
- Switch mains isolator on.
- Check each phase voltage by means of voltmeter and phase selector switch. In each selector switch position the voltmeter must indicate the mains supply voltage.
- Switch control system on means the key switch and control on button on the control panel
Positions of the key switch :

left latching :	off
right latching :	on
control on button :	start pulse
- Check that control power is on (the light of the push button is on).
- Panel cooling fan will automatically be switched on by thermostat.

5.2 Turning the Plant Control System OFF

- Stop the plant (emptying) by the corresponding switches.
- Switch the control power off using the key switch on the control panel (running motors will be stopped, single acting valves close, indicators are switched off, etc.)
- Switch off mains isolator; required for servicing and maintenance work on the control system (complete plant, incl. plant control system, no longer live. Exceptions if any are: panel heaters, panel illumination, standby heating, UPS, etc. Because of the battery buffering of the PLC memory, all data remain stored)

Caution : during normal production operation the plant must never be turned off using

- Mains switch
- Control power switch
- Emergency Stop button
- Maintenance switches

This could result in jammed conveying elements.

6 Plant Operation

Explanations for the description of the sequence actions :

M : Manual Mode
A : Automatic Mode
L : Local Mode

Warning indication means : indication by a lamp
Alarm indication means : indication by a lamp and alarm-horn

Alarm indication (if necessary) means : an alarm will be indicated, but if the element is not running - caused by an interlocking failure- no alarm will be indicated.

Some general sequences

Starting of a motor:

- close motor contactor
- wait a predefined time
- start fan for motor cooling (if any)

Stopping of a motor:

- open motor contactor
- stop fan for motor cooling (if any)

Starting of a motor which is equipped with a speed monitor :

- start motor
- start predefined delay time for activating supervision with speed monitor

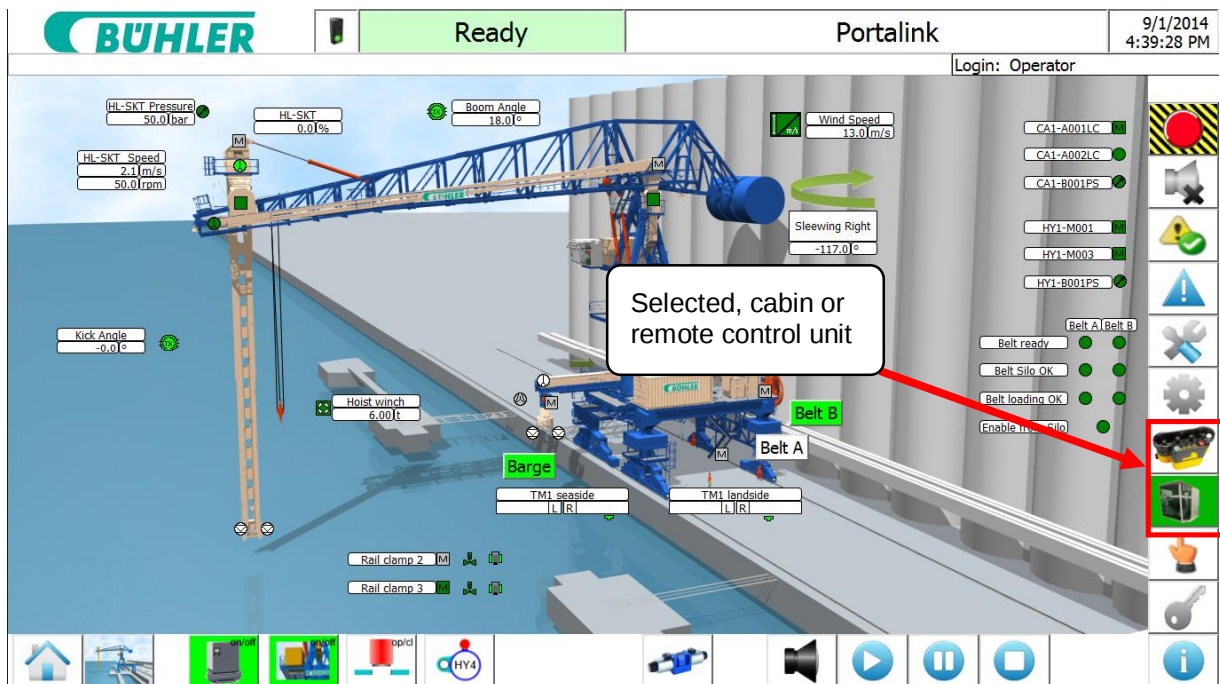
Stopping of a motor which is equipped with a speed monitor :

- deactivate supervision with speed monitor
- stop motor

7 Plant Control

The plant is operated from the Video screen on the control panel and from the radio remote control unit. If radio remote control unit doesn't work, the plant can also be operated from the wired control board and the emergency-wire control unit by the hydraulic.

7.1.1 Selection



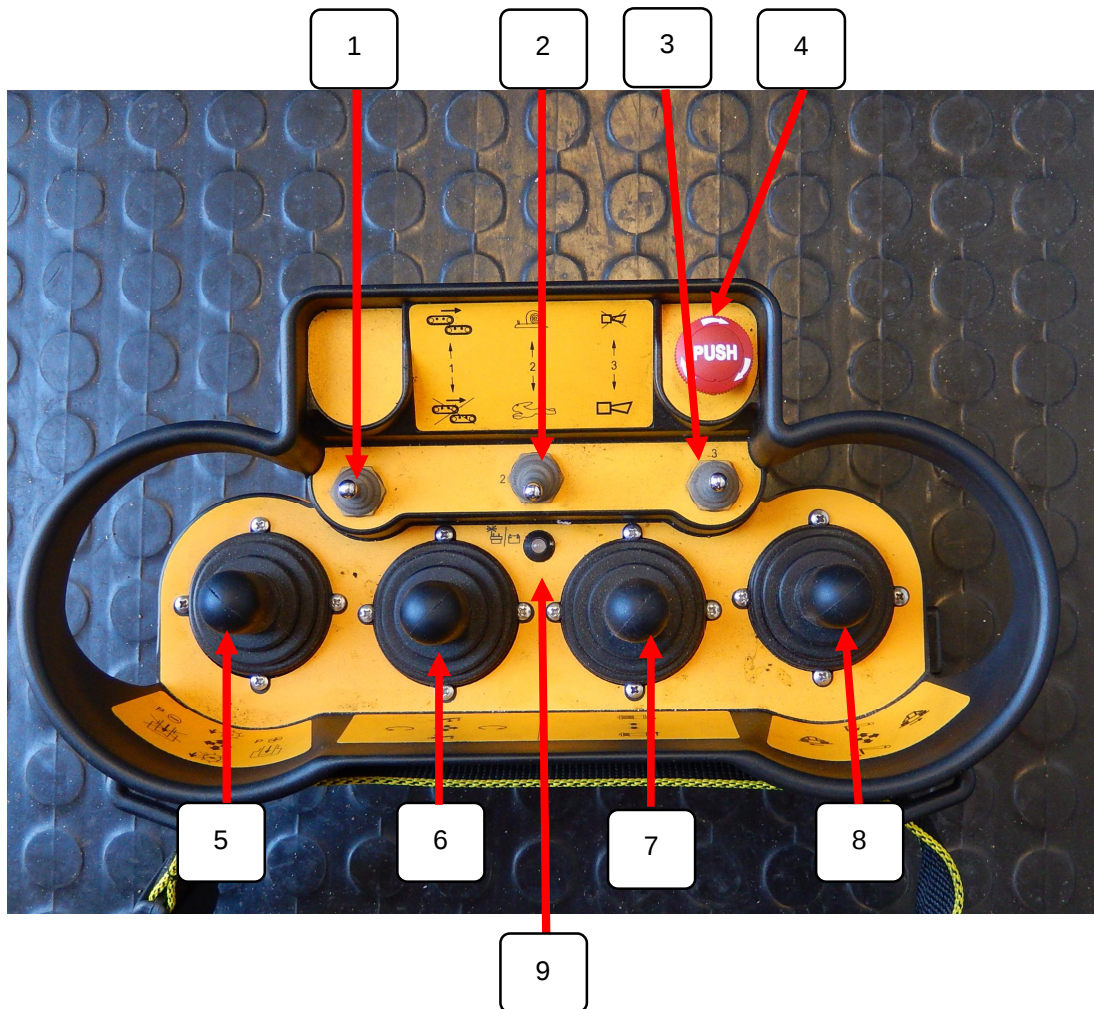
If you select „Remote control unit“ -the touch button color change to yellow ==> its selected, but not logged in.

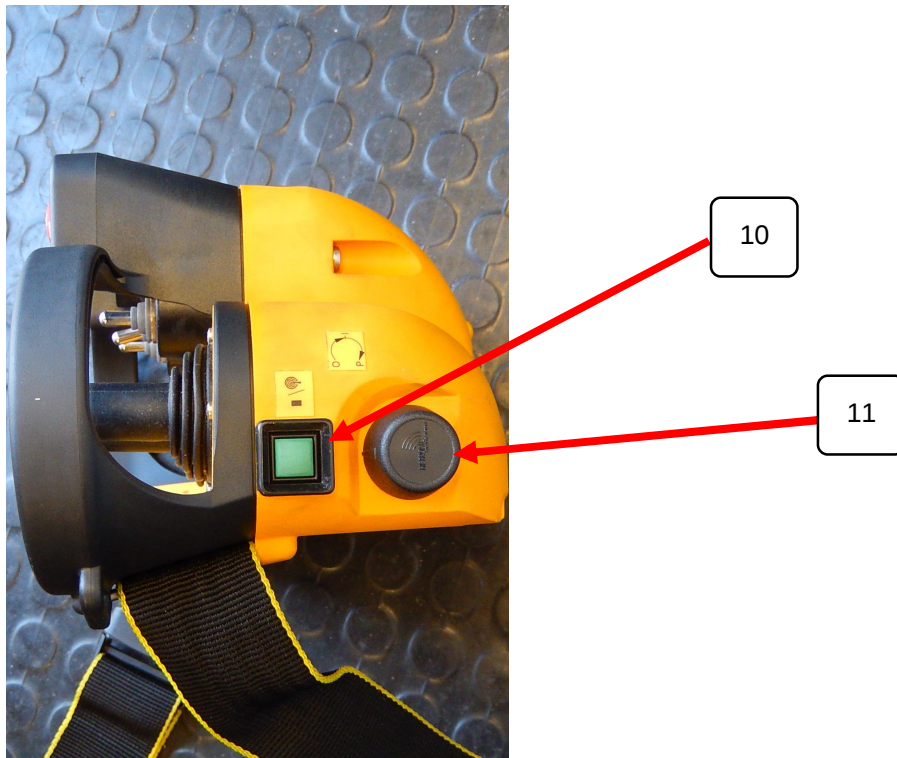
Operation log in Remote control unit: - push the green button on the Remote control unit, the touch button color change to green indication.

Note: Please switch on earlier the Remote control unit before select “Remote control unit” (not switch before – its create emergency stop)!

7.2 Remote control unit

7.2.1 Description of function





1.	Switch	Up Down	Sequence start Sequence stop
2.	Switch	Up Down	Slow movement speed 70% Fast movement speed 100%
3.	Switch	Up Down	Horn Reset Horn control
4.	Button		Emergency Stop
5.	Joystick	Up Down Left Right	HL-SKT On HL-SKT Off Sink In Automatic Off Sink In Automatic On
6.	Joystick	Up Down Left Right	Boom up Boom down Slewing left Slewing right
7.	Joystick	Up Down	Winch up Winch down
8.	Joystick	Up Down Left Right	Kick In Kick Out Travelling Left Travelling Right

9.	LED	Green light = battery charged and ok Red light flashing = battery goes empty
10.	Green Button	Logon Remote control and Start warning
11.	Key Switch	Remote control on – off

Special function:

- Fault Reset:

3.	Switch	Up	Horn Reset
----	--------	----	------------

Hold this switch for 5 seconds.

- HL-SKT speed faster: (only working in “Sequence Start”)

1.	Switch	Up	Sequence Start
AND			
5.	Joystick	Right	Sink In Automatic On

- HL-SKT speed slower: (only working in “Sequence Start”)

1.	Switch	Up	Sequence Start
AND			
5.	Joystick	Left	Sink In Automatic OFF

- Start motor in Service mode: (only working in “Service mode” see [chapter 8.6](#))

1.	Switch	Up	Sequence Start
----	--------	----	----------------

- Stop motor in Service mode: (only working in “Service mode” see [chapter 8.6](#))

1.	Switch	Down	Sequence Stop
----	--------	------	---------------

7.3 Cabin seat control unit general (Option)

7.3.1 Description of function



8 Operator Panel SIMATIC TP1900

The state of the plant is displayed on the screen.



control panel	Functionality	Device
Analogue displays	- Wind speed - Kick angle - Boom angle - Slewing angle - HL-SKT Speed - Hydraulic Oil-temp. - HL-SKT Pressure	[m/s] [°] [°] [°] [rpm]-[m/s] [°C] [bar]
Information	HL- SKT on Boom -BKT Sequence on Hydraulic on	Visualisation
Fault information	General Fault	Text

8.1 General Line Symbol Liberty

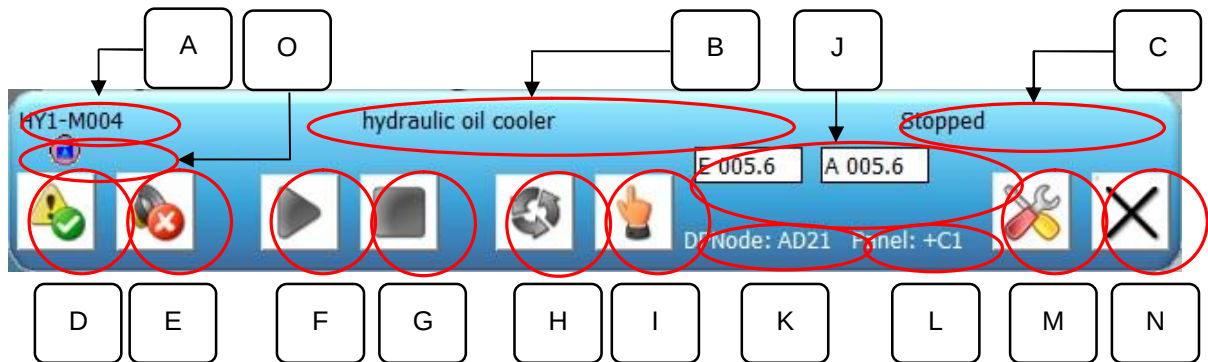
	Switch the page to the Start
	Switch the page to the Portalink general
	Command Compressor ON / OFF
	Command Hydraulic unit ON / OFF
	Command storm anchor Open / Close
	Go to middle Park Position ON / OFF
	Switch to the page general hydraulic unit
	Command Start warning
	Command Sequence Start / Command Start HL-SKT
	Command Stop HL-SKT
	Command Sequence Stop
	Switch to the Info page
	Switch to the help page
	Command Log In / Log Off
	Command Service mode (Set the Line in Service mode the Local Service switch its now active)
	Command Automatic mode
	Command Seat Control
	Command Remote Control
	Switch to the Page Settings
	Switch to the page Service
	Show all current fault message
	Command Fault reset
	Command Horn OFF
	Command Software Emergency stop
	Command Real clamp Open / Close
	Switch to the message Archive page
	Switch to the Slewing Settings page
	Switch to the Seat control unit Settings page
	Switch to the Remote control unit Settings page

	Switch to the Diverter box Settings page
	Switch to the General elements page
	Switch to the User Settings page
	Switch to the PROFIBUS page
	Switch to the Service time Settings page
	Switch OFF the Operator Panel

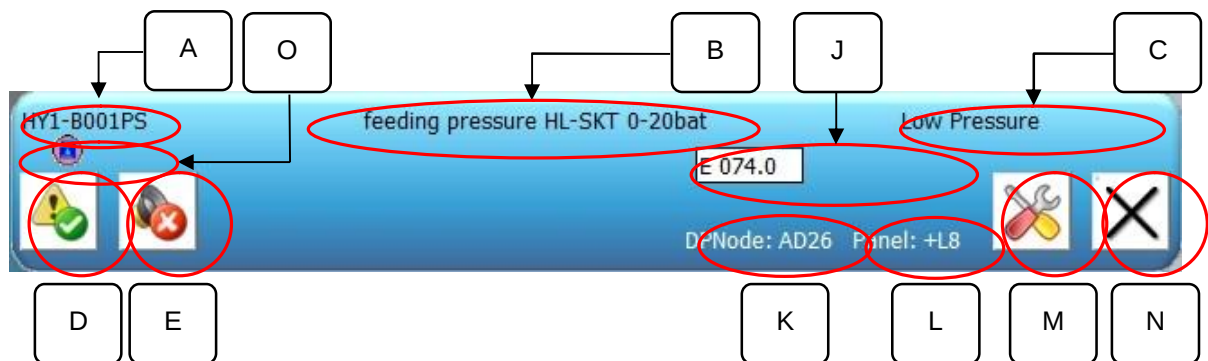
8.2 Faceplate

The faceplate display for the motors and other elements are shown below.

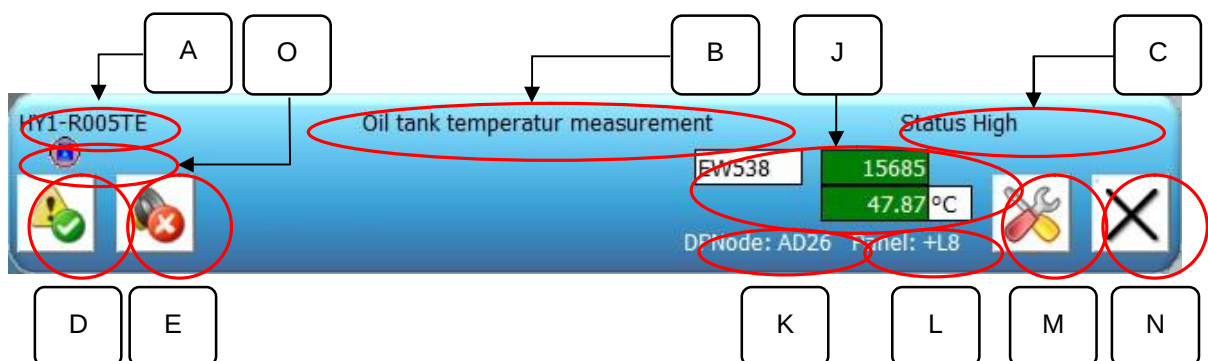
8.2.1 Motor faceplate:



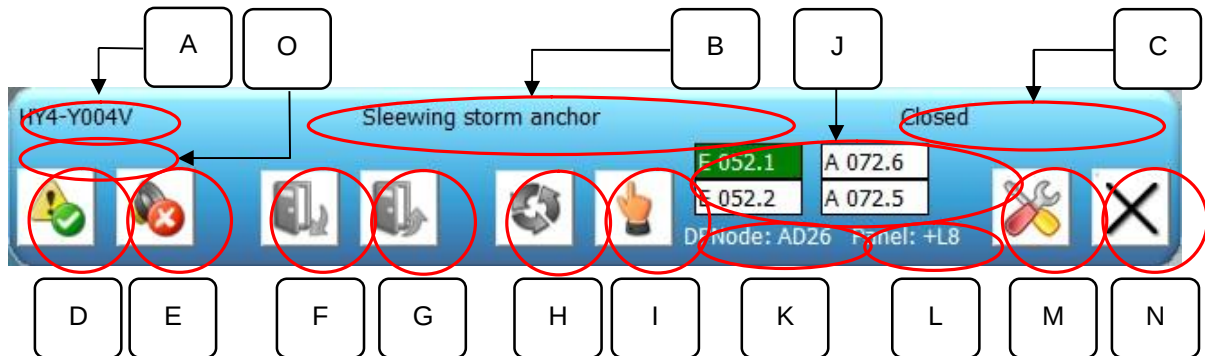
8.2.2 Digital Input faceplate:



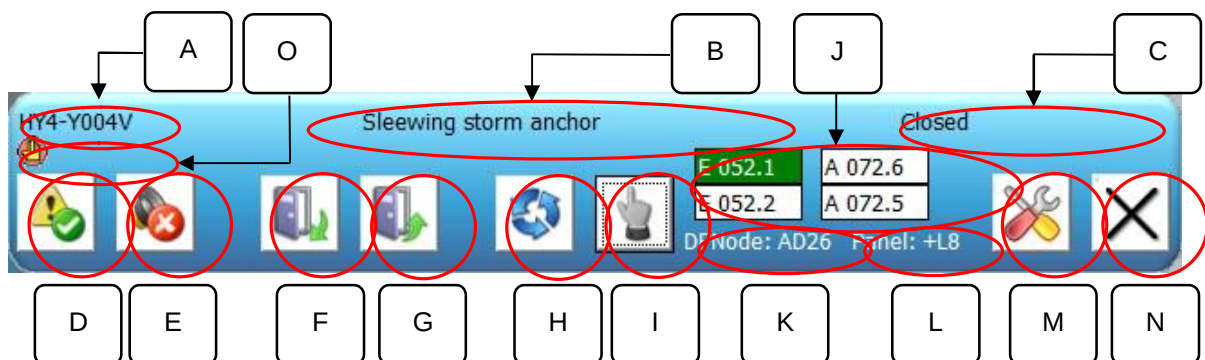
8.2.3 Analogue Input faceplate:



8.2.4 Flap / Valve faceplate:



8.2.5 Flap / Valve faceplate In Manual mode:



- A. Element name
- B. Element description
- C. Element status
- D. Auto mode
- E. Manual mode
- F. Manual start
- G. Manual stop
- H. Auto mode
- I. Manual mode
- J. Status and address
 - 1. ☒ The input or output is True
 - 2. ☐ The input or output is False
- K. PROFIBUS node
- L. Panel name
- M. Element settings (see more [chapter 3.4](#))
- N. Exit
- O. Element status info
 - 1. Element is in manual mode

2.  Element is in passive mode
3.  Element is forced
4.  Element has a emergency stop
5.  Element has a PROFIBUS fault
6.  Element has a input fault
7.  Element has a warning

The buttons as shown **F** and **G** gets activated only when manual mode button i.e. button as shown **E** is pressed to start a machine in the manual mode.

8.3 Element Settings

On this "Setting page for elements" is shown all possible parameters of the elements. On the right side are the operating hour counters of the elements and the Fault time counter.

On the left side are the parameter elements shown. With admin authorisation it is possible to switch the parameter elements and forcing input elements.

8.3.1 Motor element:

A

Setting Page for Elements

✕

Set Element Parameter

Par Monitoring Time	15.0	sec
Par Starting Delay Time	0.0	sec
Par Starting Time	20.0	sec
Par Stopping Time	0.0	sec
Par Idling Time	0.0	sec
Par Delay Fault Time	1.0	sec

Output Element value

Out Time Started	0.1	h
Out Time Faulted	0.0	h

Download and Upload





B
C

A

8.3.2 Digital Output element:

Setting Page for Elements

Set Element Parameter		Output Element value	
Par Starting Delay Time	0.0 sec	Out Time Started	25.6 h
Par Starting Time	0.0 sec	Out Time Faulted	0.0 h
Par On Time	1.0 sec		
Par Off Time	0.0 sec		
Par Idling Time	0.0 sec		
Par Delay Fault Time	0.0 sec		
		Download and Upload	

B C

8.3.3 Digital Input element:

Setting Page for Elements

Set Element Parameter		Output Element value	
Par Delay Time Change	0.0 sec	Out Time True	0.0 h
Par Delay Time True	1.0 sec	Out Time Faulted	0.0 h
Par Delay Time False	0.0 sec		
Par Timeout Time True	0.0 sec		
Par Timeout Time False	0.0 sec		
		Input Forcet	
		Download and Upload	

D E F

B C

8.3.4

Analogue Input element:

Setting Page for Elements

A 

Set Element Parameter		Output Element value	
Par Limit Low Low	10.000 °C	Out Time Faulted	0.0 h
Par Limit Low	30.000 °C		
Par Limit High	45.000 °C		
Par Limit High High	75.000 °C		
Par Limit Mon. Time Low Low	0.0 sec		
Par Limit Mon. Limit Low	0.0 sec		
Par Limit Mon. Limit Midle	0.0 sec		
Par Limit Mon. Limit High	0.0 sec		
Par Limit Mon. Limit High High	0.0 sec		
Par Delay Time Down	1.0 sec		
Par Delay Time Up	1.0 sec		
Par Delay Fault Time	0.0 sec		
Par Units By Min Digits	0.000 °C		
Par Units By Max Digits	100.000 °C		

E

D

B

C

Input Forcet

Input Value Forcet 55.0 °C

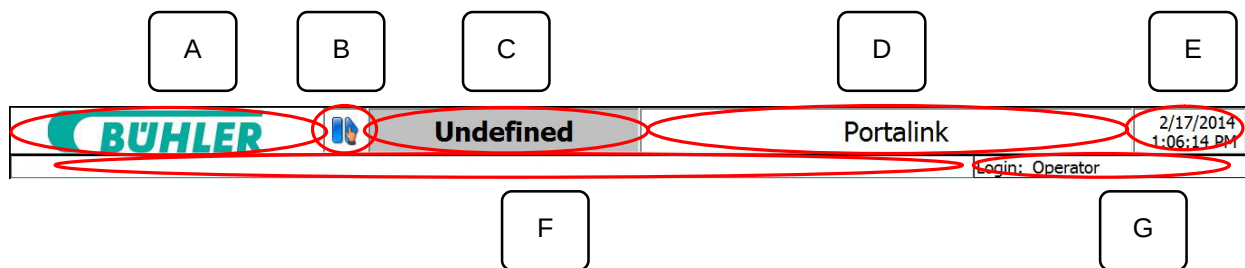






- A. Exit
- B. Download of the set values to the PLC
- C. Upload from the PLC
- D. Force OFF
- E. Force ON / true
- F. Force false

8.4 Screen header



- A. Buhler logo.
- B. Line Status symbol.
 - 1.  Ready for "Sequence Start"
 - 2.  Not ready for "Sequence Start"
 - 3.  Start warning
 - 4.  Line is in "Service mode"
 - 5.  The plant has a fault
 - 6.  Emptying from the line
 - 7.  HL-SKT is not running
 - 8.  Emergency Stop
 - 9.  High Level from silo
 - 10.  General fault from silo
 - 11.  Start please
- C. Line Status.
- D. Title of the page.
- E. Date & time display.
- F. Alarm display
(by clicking on this area the operator can open the alarm log screen)
- G. User login.

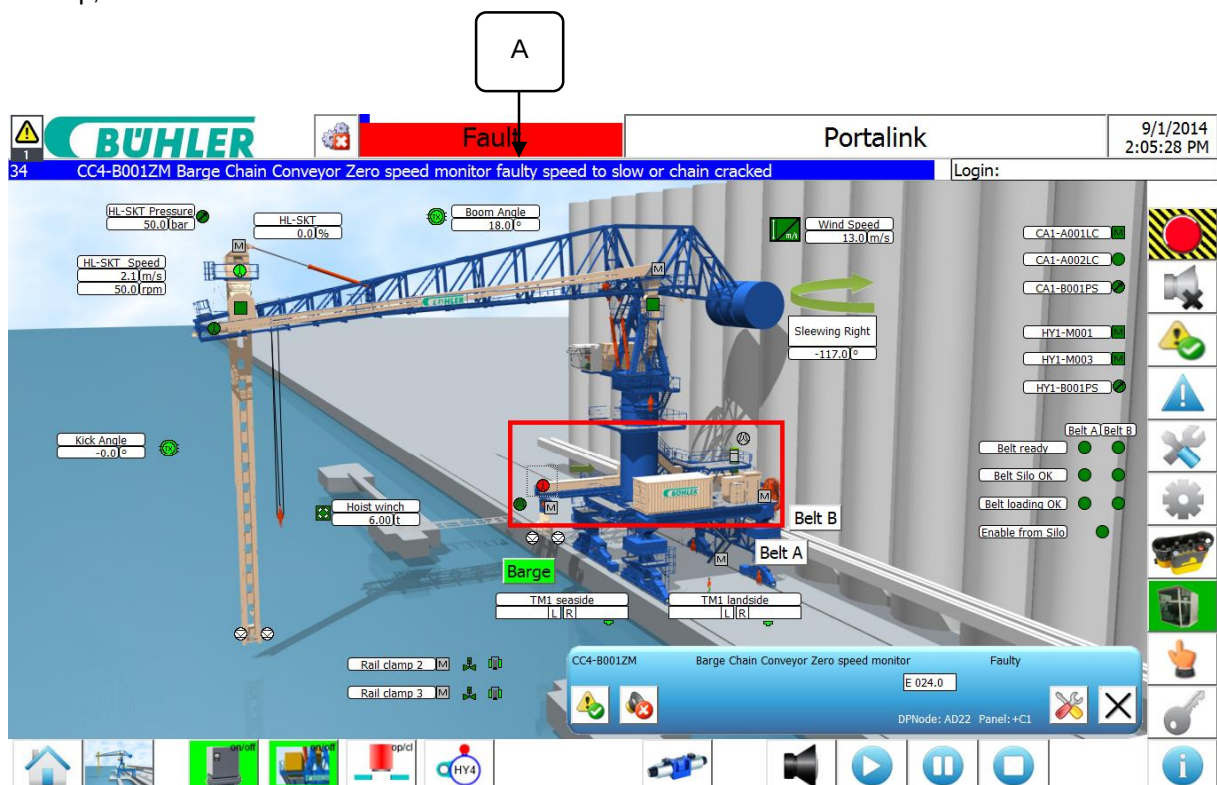
8.5 Alarm screen

Errors or the warnings of the elements are displayed in the alarm logging screen. These errors or warnings are recorded in a log file. When the error is rectified the alarm will be acknowledged but the display will be there in the screen.

The messages include:

- Date / Month / Year & Time (09:01:2014 / 14:05:28)
- Element identification in the text column
- Status of the alarm occurred.

A potential free contact is provided to connect external signalisation elements, such as a signal horn, flash lamp, etc.



Click on area shown (A) to get the alarm screen. This screen shows all the previous alarm events.

A

Ready

Alarm Archive

8/29/2014
1:08:13 PM

No.	Time	Date	Status	Text	A...
277	4:31:11 PM	8/28/2014	CD	LS1-M002 Barge Loading Spout Fan In Manual mode	0
277	4:30:53 PM	8/28/2014	C	LS1-M002 Barge Loading Spout Fan In Manual mode	0
277	4:27:44 PM	8/28/2014	C	LS1-M002 Barge Loading Spout Fan In Manual mode	0
277	4:23:54 PM	8/28/2014	C	LS1-M002 Barge Loading Spout Fan In Manual mode	0
277	4:22:49 PM	8/28/2014	C	LS1-M002 Barge Loading Spout Fan In Manual mode	0
277	4:21:50 PM	8/28/2014	C	LS1-M002 Barge Loading Spout Fan In Manual mode	0
137	5:13:20 PM	8/27/2014	C	HY1-B009PS maneuver pump clogging indicator forcet The Sensor is not in function	0
146	3:11:06 PM	8/27/2014	C	HY1-R005TE Oil tank temperatur measurement warning	0
27	2:09:24 PM	8/26/2014	C	CC3-B001HL chain conveyor high level faulty	0
101	2:08:24 PM	8/26/2014	CD	IFS-F105 interface to Portalink silo Belt B ready faulty	0
101	2:08:00 PM	8/26/2014	C	IFS-F105 interface to Portalink silo Belt B ready faulty	0
101	2:05:56 PM	8/26/2014	CD	IFS-F105 interface to Portalink silo Belt B ready faulty	0
101	1:58:19 PM	8/26/2014	C	IFS-F105 interface to Portalink silo Belt B ready faulty	0
372	1:56:42 PM	8/26/2014	C	TM1-FC1-K3 Travelling Freqeunce converter by-pass warning	0
16	1:56:42 PM	8/26/2014	C	CA1-K002LC_Alarm Air Compressor Dryer Alarm faulty	0
13	1:56:42 PM	8/26/2014	C	CA1-K001LC_Alarm Air Compressor Alarm faulty	0
178	1:55:13 PM	8/26/2014	I	HY2-Y004V Boom cylinder Boom / Kick floating warning	0
178	1:55:07 PM	8/26/2014	IO	HY2-Y004V Boom cylinder Boom / Kick floating warning	0
178	1:54:57 PM	8/26/2014	I	HY2-Y004V Boom cylinder Boom / Kick floating warning	0
178	1:54:48 PM	8/26/2014	IO	HY2-Y004V Boom cylinder Boom / Kick floating warning	0
372	1:54:30 PM	8/26/2014	C	TM1-FC1-K3 Travelling Freqeunce converter by-pass warning	0
178	1:54:30 PM	8/26/2014	I	HY2-Y004V Boom cylinder Boom / Kick floating warning	0
16	1:54:30 PM	8/26/2014	C	CA1-K002LC_Alarm Air Compressor Dryer Alarm faulty	0
13	1:54:30 PM	8/26/2014	C	CA1-K001LC_Alarm Air Compressor Alarm faulty	0
230	1:27:03 PM	8/26/2014	CD	IFS-F103 interface to Portalink silo Belt A loading ok forcet The Sensor is not in function	0
228	1:27:03 PM	8/26/2014	CD	IFS-F102 interface to Portalink silo Belt A Silo ok forcet The Sensor is not in function	0
226	1:27:03 PM	8/26/2014	CD	IFS-F101 interface to Portalink silo Belt A ready forcet The Sensor is not in function	0

The alarm screen is shown here. It show the time, date of occurrence of a fault. The Element description is also shown.

- A → Status of the alarm.
 - ➔ C = Alarm activated
 - ➔ A = Alarm acknowledged
 - ➔ D = Alarm deactivated

8.6 Service mode

The "Service" mode can only be activated if the line is in "Ready" or in "Passiv" state.

To activate the "Service" mode: - push the button right hand side on the screen, see red arrow with hand symbol on picture.



If status "Service" mode is correctly selected (Service is yellow indicated on the screen, see picture).



Service
Service help page

8/29/2014
1:37:48 PM

4. Now its the element in "Manual mode"

5 Now its possible to start and stop the motor with the Remote Control Unit (!!The faceplate need to remain open!!)

5.2 Motor start with	--> "Sequence start"
5.2 Motor stop with	--> "Sequence stop"

8.6.1 HL-SKT motor start Reverse in Service mode

Service
Service help page

9/4/2014
2:19:25 PM

How you can start reverse the HL-SKT in the "Service mode"

1. Set the HL-SKT motor in Manual mode (look page 1,2)

Set Output Value Units

+0.0 %

▶
◻
📊

CC1-VT-T1 HL-SKT forward/backward set point Stopped

AW516
0

A 062.0
0.00 %

DPNode: AD26
Panel: +L8

2. Set a negativ Value for reverse direction (positiv Value = Forward direction)

2.1 Now its possible Start and stop with the remot econtrol unit (Look page 2)

Set Output Value Units

-15.0 %

▶
◻
📊

CC1-VT-T1 HL-SKT forward/backward set point Started

AW516
-4915

A 062.0
-15.00 %

DPNode: AD26
Panel: +L8

8.7 Service Time

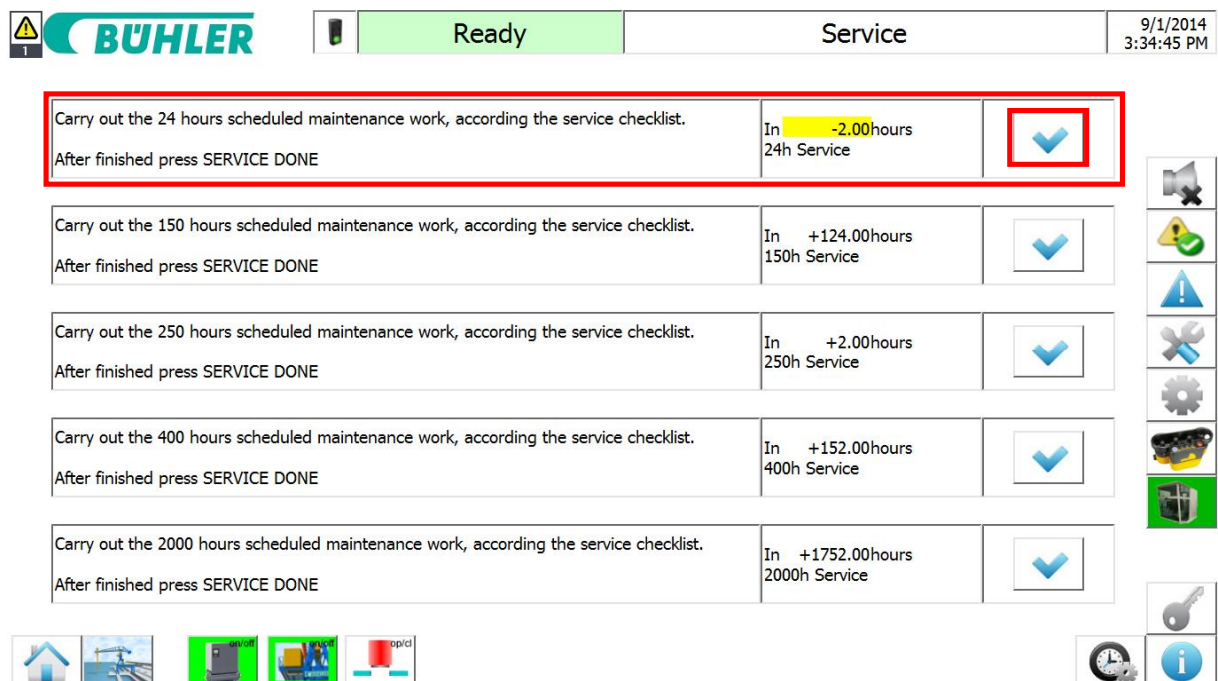
If a service interval on the screen indicated (message on screen - see picture)

Select Service / Reset after Service done:

- 1.) Push / touch the button "Service" on the screen (see red arrow on picture)



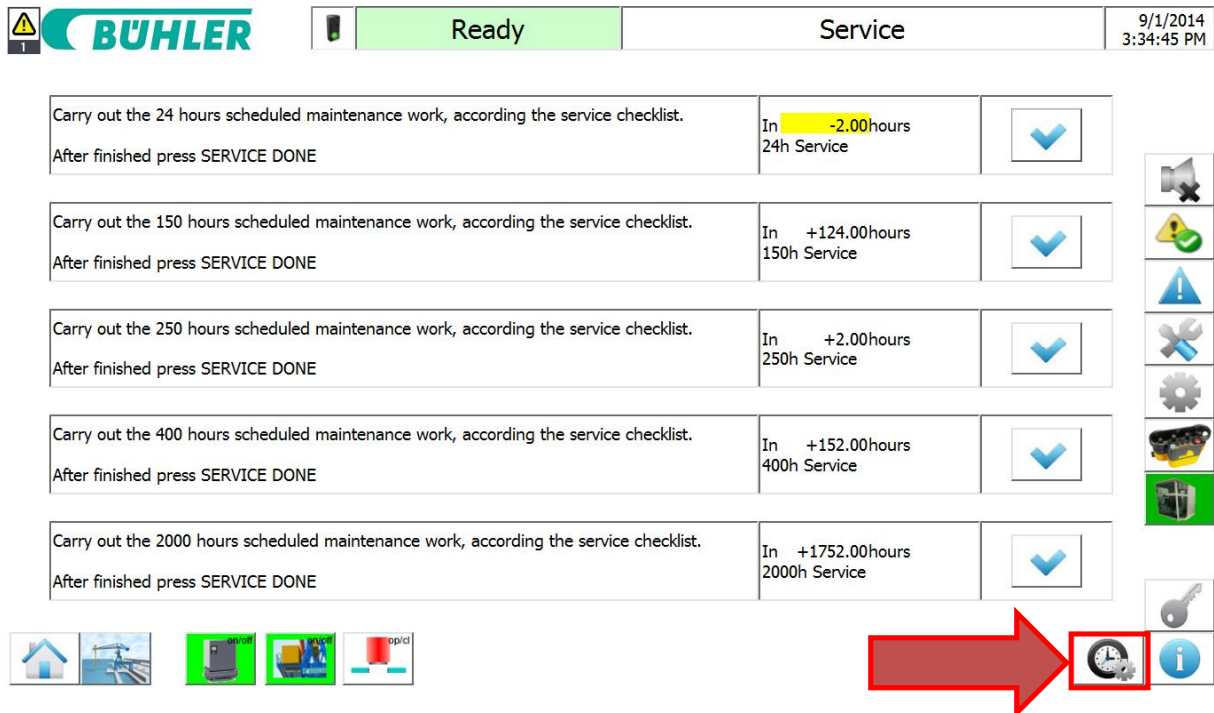
- 2.) Activate with the „OK“ button if the Service done!



8.7.1 Set Service Time

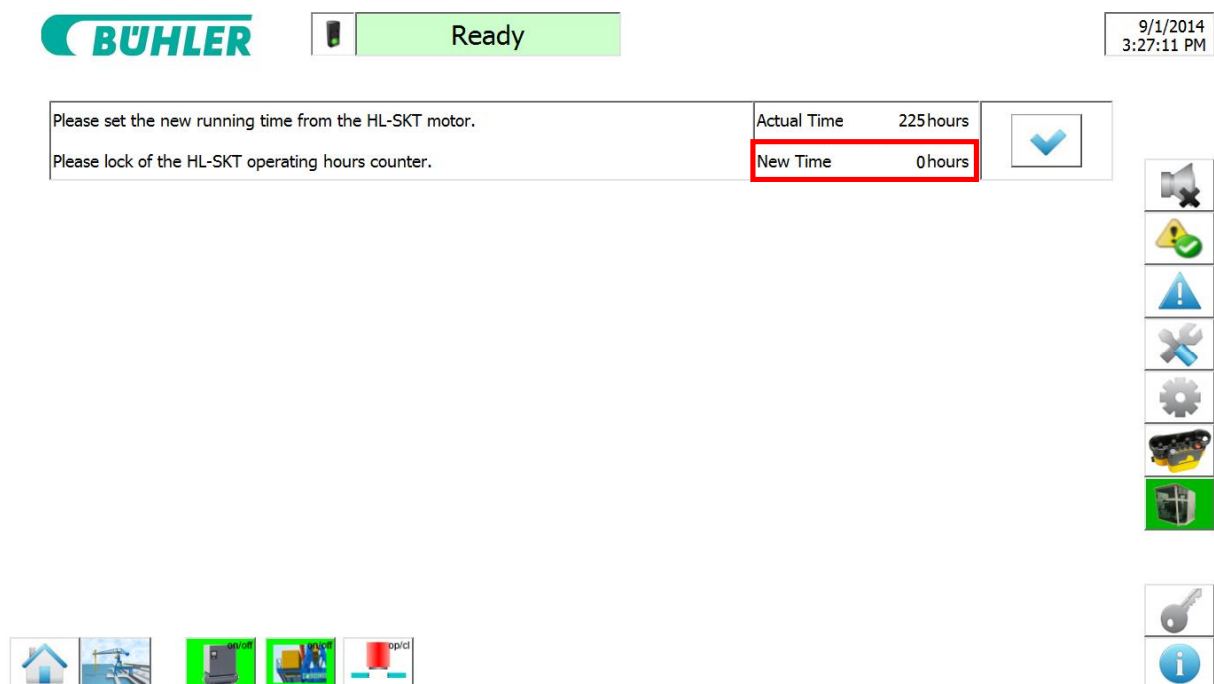
If not the correct service time indicated on PLC/CPU, with following operation its possible to set the actual time:

1. Check in panel +C1 / +L8 the analog hour counter (note actual)
2. Go to "Service Page"
3. Push "Settings time" button (see on picture the red arrow)



BÜHLER		Ready	Service	9/1/2014 3:34:45 PM
Carry out the 24 hours scheduled maintenance work, according the service checklist. After finished press SERVICE DONE	In -2.00hours 24h Service	☒		
Carry out the 150 hours scheduled maintenance work, according the service checklist. After finished press SERVICE DONE	In +124.00hours 150h Service	☒		
Carry out the 250 hours scheduled maintenance work, according the service checklist. After finished press SERVICE DONE	In +2.00hours 250h Service	☒		
Carry out the 400 hours scheduled maintenance work, according the service checklist. After finished press SERVICE DONE	In +152.00hours 400h Service	☒		
Carry out the 2000 hours scheduled maintenance work, according the service checklist. After finished press SERVICE DONE	In +1752.00hours 2000h Service	☒		

4. Write the current (actual) time from system in the field "New Time" and confirm with "OK"



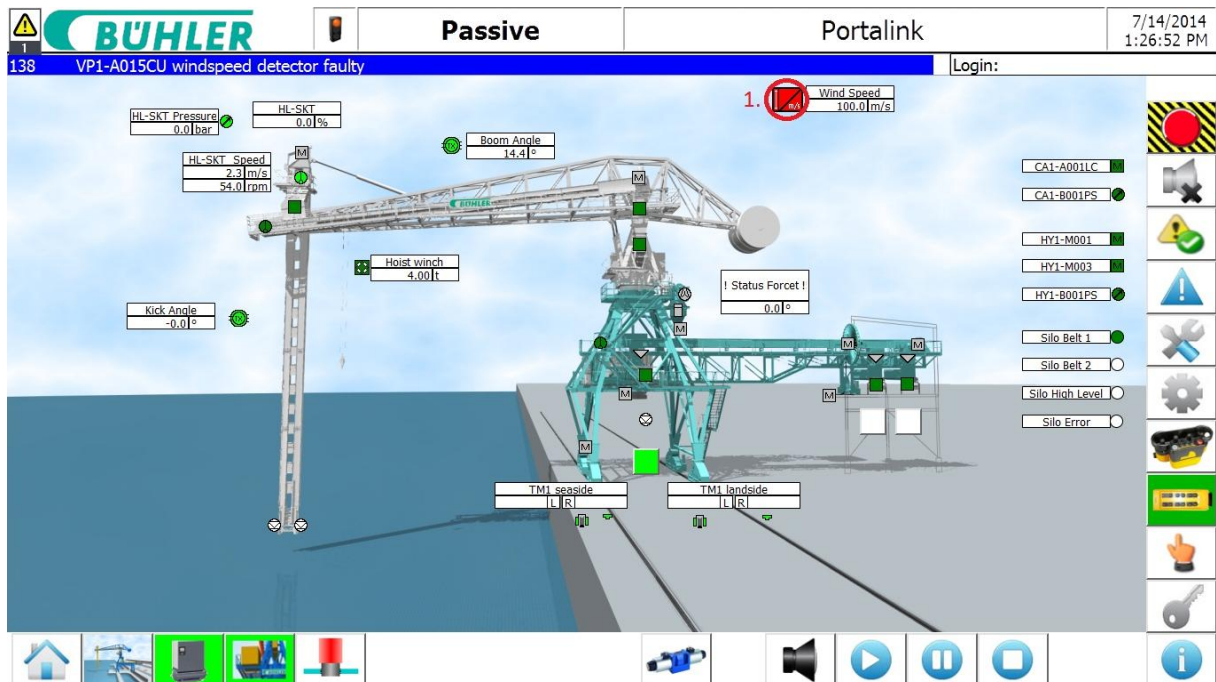
BÜHLER		Ready	9/1/2014 3:27:11 PM				
Please set the new running time from the HL-SKT motor. Please lock of the HL-SKT operating hours counter.	<table border="1"> <tr> <td>Actual Time</td> <td>225 hours</td> </tr> <tr> <td>New Time</td> <td>0 hours</td> </tr> </table>	Actual Time	225 hours	New Time	0 hours	☒	
Actual Time	225 hours						
New Time	0 hours						

8.8 Forcing status from Element

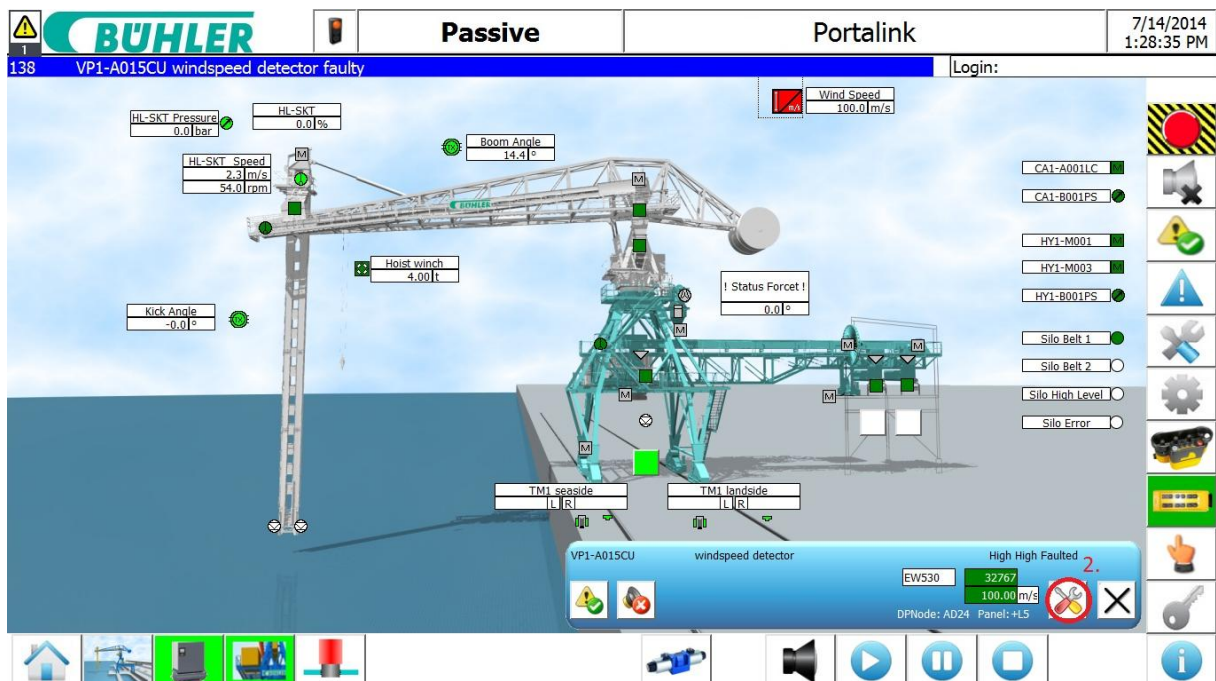
!!! To work in this situation is dangerous, because no interlocking is activated !!!

!!! It is to use only in emergency case !!!

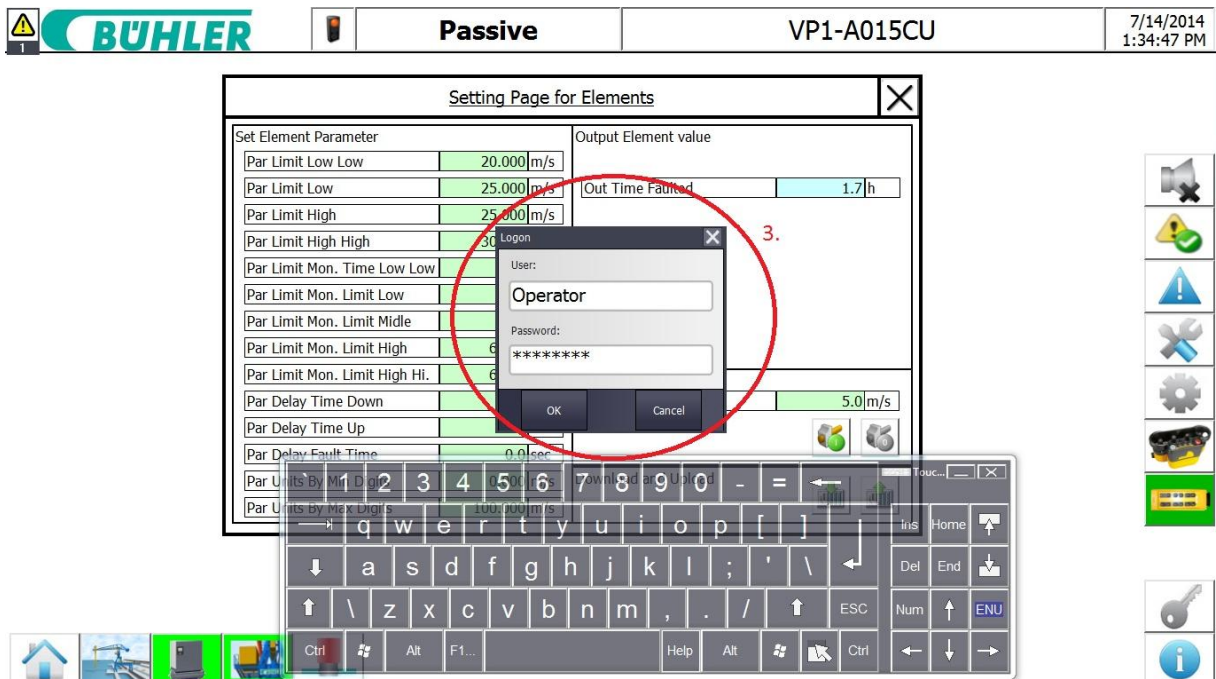
1. Select desired Element, the "faceplate" window goes active



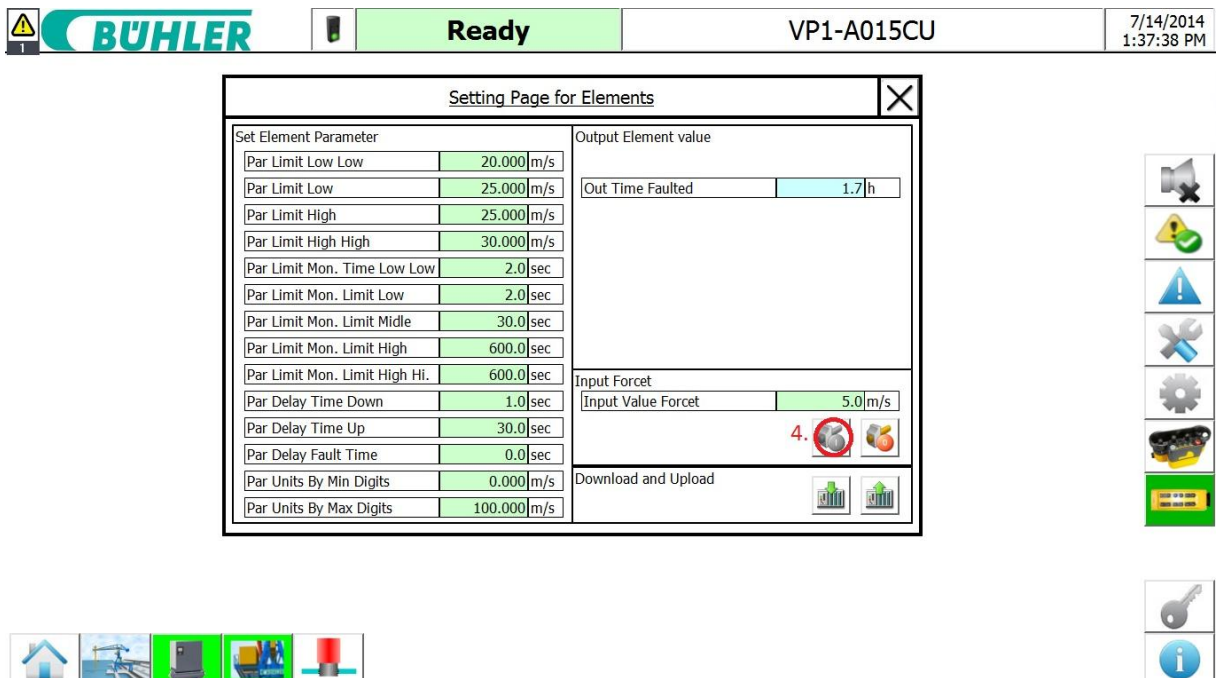
2. Select on faceplate symbol "Settings Page for Elements"



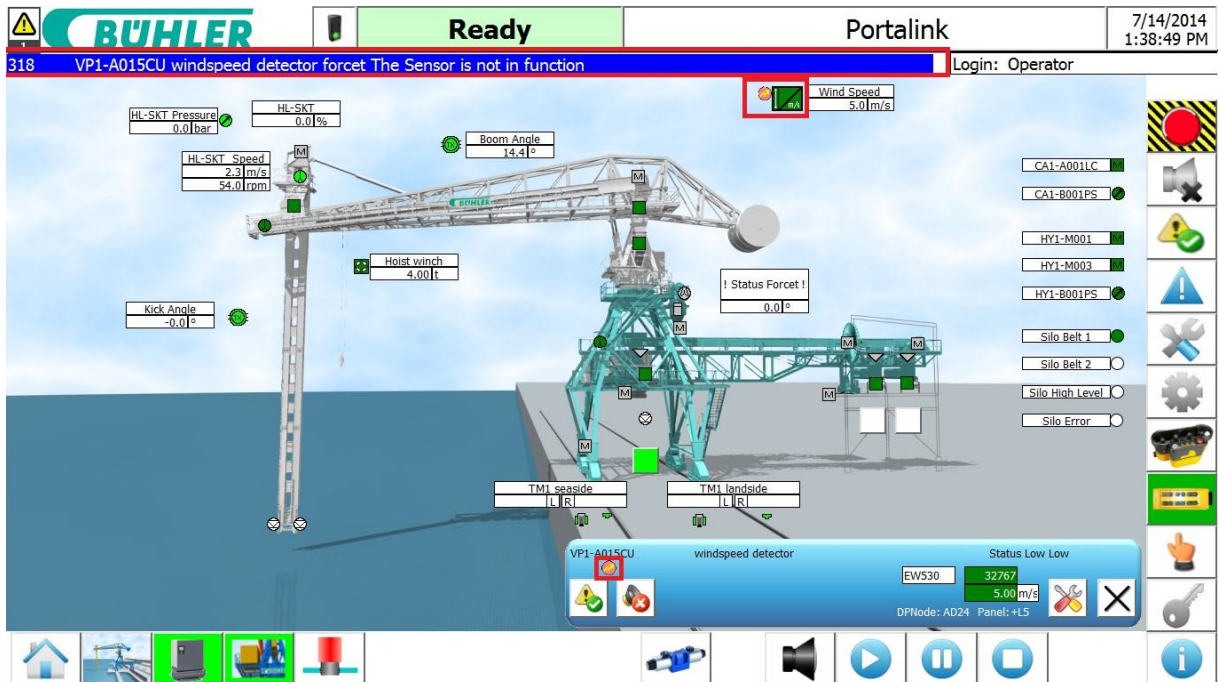
3. To set up/adjust special parameter, its need permission with special log in.
Activation: touch the window "cmd ForceOn" button or touch a green (desired) field.



4. After log in, the „ForceOn“ button are active ==> the button change to grey color and the „ForceOff“ button change to colored indication.



- If all steps done / ok, the desired element are forced. The "Force Symbol" and a warning message on the screen indicated (see picture). If the Element in status „Fault“ please push the "Reset Fault" button!

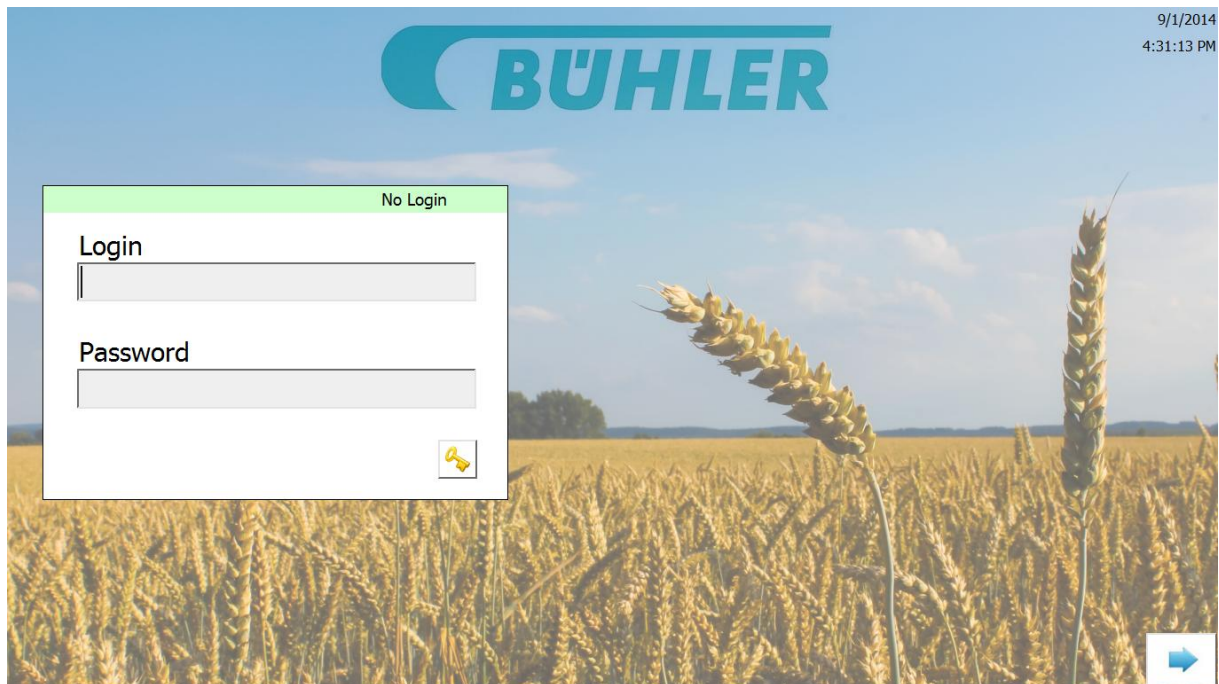


8.9 Level of Pictures

All symbol buttons in chapter 8.1 described.

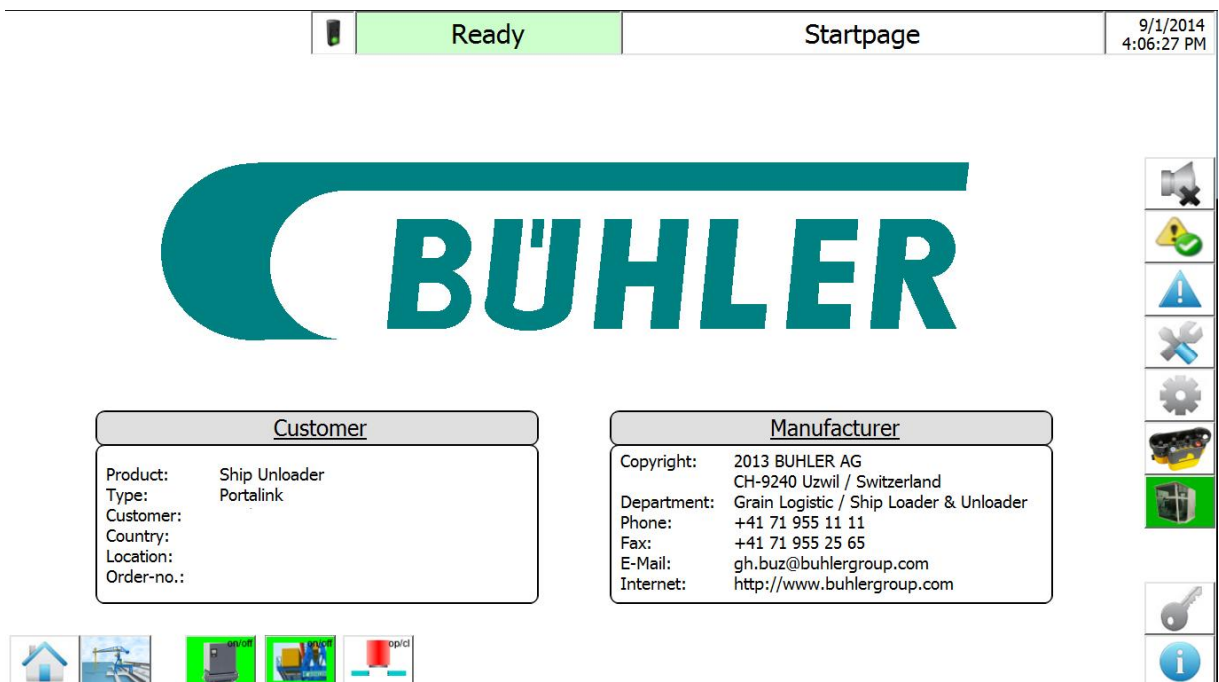
8.9.1 Login page

If the system switched ON, first the „Login“ page automatically indicated on the screen. With Sign in (Login and Password) all in the manual described functions possible. Limited operation / function with out sign in are to activate: -push/touch the blue arrow button on the screen.



8.9.2 Start page

Next page opens after operation acc. chapter 8.9.1



8.9.3 Portalink general page



This is the main used picture for the plant operator. It shows the status of the ship unloader.

Status of the elements:

	Passive (No communication)	Element in passive mode with no communication to PLC
	Passive	Element in passive mode with communication to PLC
	Starting	Element in starting condition
	Started	Element is started
	Stopping	Element in stopping condition
	Fault	Element has a fault
	Starting delay	Element starting delay

8.10 Portal Chain-Conveyors



8.11 Hydraulic Unit

On this page all exist hydraulic elements listed / described (valve, filter, pump etc.)

HY1	Y001V --> Pressure step 220bar Y002V --> Oil Heating	Y01 Y02 [Valve Icon]
HY2	Y001V --> Boom up Y002V --> Boom down Y003V --> Boom up/down Y004V --> Floating	Y01-Y02 Y03 Y04 [Valve Icon] [Valve Icon] [Valve Icon]
HY3	Y001V --> Kick in Y002V --> Kick out Y001V --> Floating	Y01-Y02 Y03 [Valve Icon] [Valve Icon]
HY4	Y001V --> Slewing right Y002V --> Slewing left Y003V --> Slewing release brake Y004V --> Slewing storm anchor unlock Y005V --> Slewing storm anchor lock	Y01-Y02 Y03 Y04 Y05 [Valve Icon] [Valve Icon] [Valve Icon] [Valve Icon]
HY6	Y001V --> Hoist down Y002V --> Hoist up	Y01-Y02 [Valve Icon]

The schematic diagram on the right shows the hydraulic circuit with components labeled HL-SKT, Maneuver, and a temperature gauge for Oil Temperatur (0°C to 100°C). A legend indicates [HY2-B001PS].

8.12 Remote Control Settings

Status of Analogue Input and Output used for the Remote control





Passive

Remote Control Settings

9/1/2014
4:08:44 PM

Remote	Input	Output	Max. Digits	Min. Digits	Calibrating
Travelling Left/Right	IB 106: 0	0.0 Hz	70	70	
Boom Up/Down	IB 105: 0	0.0 Volt	70	70	
Kick In/Out	IB 107: 0	0.0 Volt	70	70	
Slewing Left/Right	IB 104: 0	0.0 Volt	70	70	
Hoist Up/Down	IB 108: 0	0.0 Volt	70	70	

IB 100: 00000000
-7 0

IB 101: 00000000
-7 0

IB 102: 00000000
-7 0

IB 103: 00000000
-7 0












Help Page :

Help wizard

Calibrating Joystick:

- 1: Select Remote mode
- 2: Press  of the desired movement
- 3: Push the Joystick Maximum plus and Maximum minus of the desired movement
- 4: Press  for entry confirmation



8.13 Seat Control Settings (Optional)

Status of Analogue Input and Output used for the Remote control

Ready

Seat Control Settings

9/1/2014
4:09:54 PM

Seat	Input	Output	Max. Digits	Min. Digits	Calibrating
Travelling Left/Right	IB 106: 0	0.0 Hz	70	126	
Boom Up/Down	IB 105: 0	0.0 Volt	70	77	
Kick In/Out	IB 107: 0	0.0 Volt	70	126	
Slewing Left/Right	IB 104: 0	0.0 Volt	70	70	

IB 32: 0000000	IB 33: 0000100	IB 34: 0000000	IB 35: 0000000
----------------	----------------	----------------	----------------

IB 659: 0100000	IB 659: 0000000
-----------------	-----------------

Help page:

Help wizard

Calibrating Joystick:

- 1: Select Seat mode
- 2: Press of the desired movement
- 3: Push the Joystick Maximum plus and Maximum minus of the desired movement
- 4: Press for entry confirmation



8.14 PROFIBUS DP

Status of the L2 DP Nodes used on the plant




Ready

Profibus DP

9/1/2014
4:18:37 PM

AD10	+L5	Hetronic	connected
AD11	+C1	CPU-315	connected
AD21	+C1	Wago node Motors	connected
AD22	+C1	Wago node Equipment	connected
AD23	+VP3	Wago node Cabin	connected
AD24	+L5	Wago node Tower	connected
AD25	+L6	Wago node Boom	connected
AD26	+L8	Wago node Hydraulic	HY1 connected
AD27	+F100	Interface Silo	VP1 connected
AD70		Rotary Encoder	HY4 connected
AD80	+VP3	Control Bord Left	connected
AD81	+VP3	Control Board Right	connected

















8.15 Slewing settings

Step 1

BUHLER		Ready	Slewing Parameter	8/17/2015 5:39:57 PM
Login: Operator				
Step 1				
1. Slewing position active end Left	----->	☒		
2. Slewing position active end Right	----->	☒		
3. Slewing position active middle 1	----->	☒		
4. Slewing position active middle 2	----->	☒		
5. Slewing position active middle 3	----->	☐		

2nd page: Calibration of Rotary indicator

Step2.11. Push the right setting symbol button to start with calibrating.

2. Go with the Boom in to the exact end position to the left side. If in correct position, push the button for Left.
3. Go with the Boom to the exact park position to the right side. If in correct position, push the button for Right.

BUHLER		Ready	Slewing Parameter	8/17/2015 5:41:06 PM						
Login: Operator										
Step 2.1										
1. Press calibrating mode On	----->									
!!Attention no automatic stop in the park position!!										
2. Turn to the left exact parking position										
2.1 Push the button when reached the park position left.	----->									
Rotary Encoder new Calibrating	----->	☐								
3. Turn to the right exact parking position										
3.1 Push the button when reached the park position right.	----->									
<table border="1"> <tr> <td>Rotary Encoder</td> <td>1830</td> </tr> <tr> <td>Slewing Position</td> <td>-10.000°</td> </tr> </table>		Rotary Encoder	1830	Slewing Position	-10.000°	<table border="1"> <tr> <td>In Park position</td> <td>Middle</td> </tr> </table>		In Park position	Middle	
Rotary Encoder	1830									
Slewing Position	-10.000°									
In Park position	Middle									

3rd page: Calibration of Rotary indicator

Step2.21. Push the right setting symbol button to start with calibrating.

2. Go with the Boom in to the exact middle park position 1 (the storm anchor needs to have the exact position over the center of storm anchor opening position left). If in correct position, push the button for middle 1.

3. Go with the Boom to the exact middle park position 2 (the storm anchor needs to have the exact position over the center of storm anchor opening position right). If in correct position, push the button for middle 2.



Ready

Slewing Parameter

8/17/2015
5:41:37 PM

Login: Operator

Step 2.2

1. Press calibrating mode On ----->

!!Attention no automatic stop in the park position!!

2. Turn to the middle exact parking position 1

2.1 Push the button when reached the park position middle 1. ----->

3. Turn to the middle exact parking position 2

3.1 Push the button when reached the park position middle 2. ----->

Rotary Encoder	1830
Slewing Position	-10.000 °

In Park position
Middle


















4nd page:

Step3.1 Set the park position Left in °.

Set the park position tolerance for the left park position.

Step3.2 Set the park position Right in °.

Set the park position tolerance for the right park position.

		 Ready	Slewing Parameter	8/17/2015 5:42:09 PM
Login: Operator				
Step 3.1				
Parking Position Left				
-20.00 °	default value 0.0°	Digits -->		500
Tolerance Parking Position left [Tolerance]-[Park Position]-[Tolerance]				
0.100 °	default value 0.100°			
Step 3.2				
Parking Position Right				
+200.00 °	default value 180.0°	Digits -->		29760
Tolerance Parking Position right [Tolerance]-[Park Position]-[Tolerance]				
0.100 °	default value 0,100°			











5nd page:

Step3.3 Set the park position middle 1 in °.(DG)

Set the park position tolerance for the middle 1 park position.

Step3.4 Set the park position middle 2 in °. (DG)

Set the park position tolerance for the middle 2 park position.

		 Ready	Slewing Parameter	8/17/2015 5:42:36 PM
Login: Operator				
Step 3.3				
Parking Position Middle 1				
-10.00 °	default value 90.0°	Digits -->		1830
Tolerance Parking Position middle 1 [Tolerance]-[Park Position]-[Tolerance]				
0.100 °	default value 0,100°			
Step 3.4				
Parking Position Middle 2				
+190.00 °	default value 90.0°	Digits -->		28430
Tolerance Parking Position middle 2 [Tolerance]-[Park Position]-[Tolerance]				
0.100 °	default value 0,100°			











6nd page:

Step 4

Set in percent the Slow speed for left and right direction.

Step 5

Set the (angle) position to start with Slow speed for Left and Right position.
Set the angle tolerance to nominal stop/anchoring position Left and Right.

		Ready	Slewing Parameter	8/17/2015 5:43:08 PM
				Login: Operator

Step 4

Slowspeed right before parking position in percent [Slowspeed] --> [Parkposition]

35.0 % default value 35.0%

Slowspeed left before parking position in percent [Parkposition] <-- [Slowspeed]

35.0 % default value 35.0%

Step 5

Start Slow Speed before Parking Position [Slow Speed]-[Park Position]-[Slow Speed]

1.50 ° default value 1,50°

Stop left before Park Position

0.100 ° default value 0,200°

Stop right before Park Position

0.100 ° default value 0,200°







←

✓

i



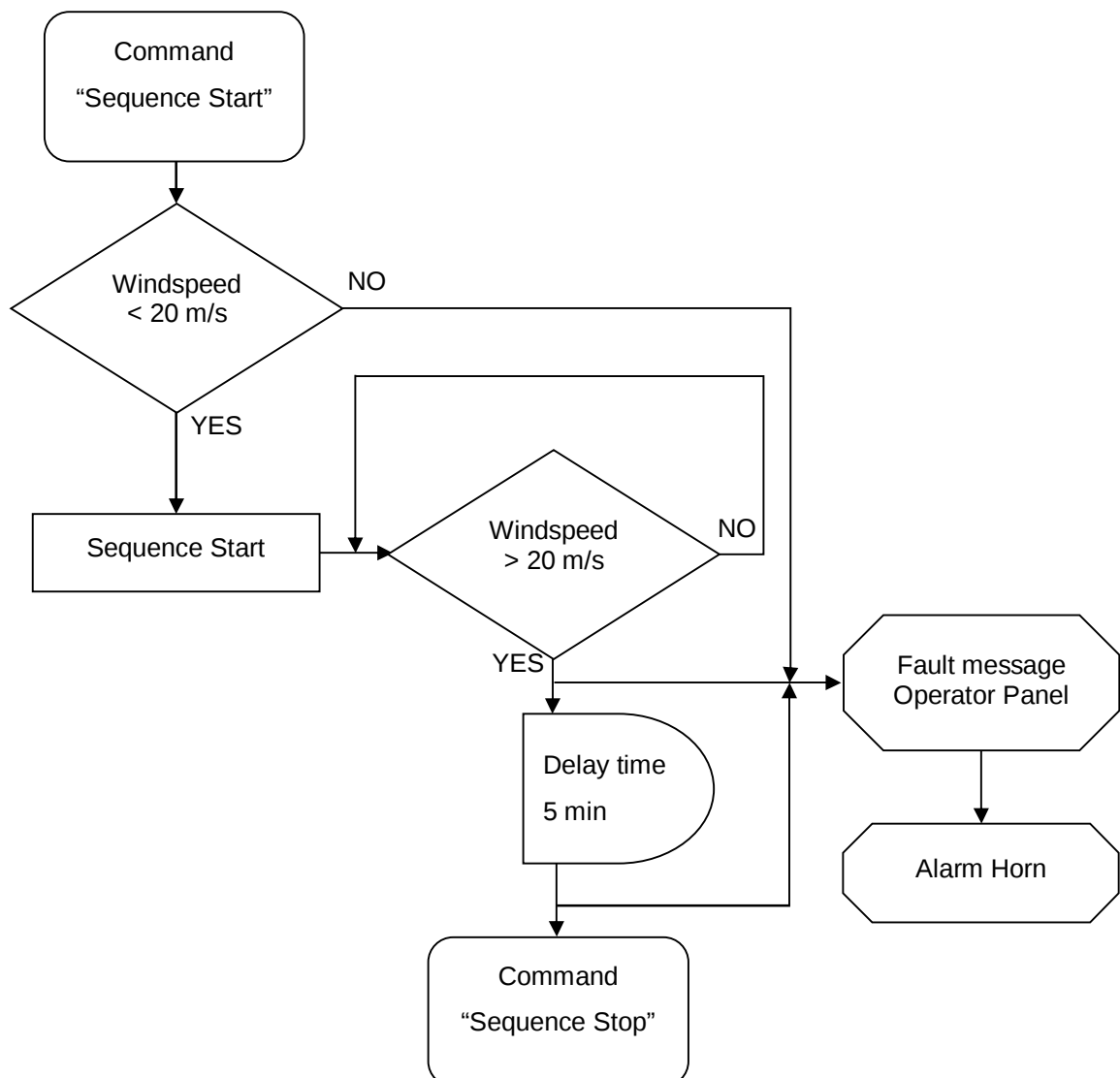







9. Interlocking

9.1 Wind speed sensor (VP1)	
- Component	Analogue wind speed detector (VP1-A015CU)
- Interlocking	"Sequence Start" possible = Wind speed < 20m/s
	Automatic "Sequence Stop" = Wind speed > 20m/s and after 10 min timeout time
- Effects	Wind speed < 20m/s = Only speed visualisation on Operation Panel
	Wind speed > 20m/s = Alarm horn and fault message on Operation Panel
	Wind speed > 20m/s = After 5min timeout time automatic Sequence Stop
- !! Attention !!	Is the wind speed higher than 20m/s the Unloader has to go to the parking and anchoring position!



9.2 Compressor Air Unit (CA1)	
- Component	Air Compressor (CA1-A001LC)
	Digital pressure switch (CA1-B001PS)
- Start / Stop	
Start conditions	Stop Conditions
- Control Power ON	- Control Power OFF
- Start/Stop button on the Operator panel	- Start/Stop button on the Operator panel
- Malfunction	- CA1-B001PS no pressure 5 min timeout time before fault
- Effects by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Stop of Compressor unit
- Note	After stopping of the CA1, the stopping of the compressor has to be delayed approx. 10minutes in order to complete dry out the absorption dryer.

9.3 Aspiration (AV1)	
- Component	Filter Control unit (AF1-A001FC)
	Aspiration Fan (AF1-M001)
	Thermocouple (AF1-R001TE)
	Thermocouple (AF1-R002TE)
- Start / Stop	
Start conditions	Stop conditions
- Control Power ON	- Line Status (Stopping)
- Line Status (Starting)	- Fan Stop delay time 60 sec
	- Filter Stop delay time 5min
- Malfunction	- CA1-B001PS no pressure compressor unit started after 5 min timeout time
	- AF1-R001TE, AF1-R002TE overheated - stop fan
- Effects by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
- Note	If the line started and one aspiration element goes to state faulty, the fault on the screen are indicated, but the line still running (no stop). If the fault solved and the line in operation/running, with the command "Sequence Start" the element starts without new start of aspiration.

9.4 Hydraulic unit (HY1)	
- Component :	
Soft Starter (HY1-M001)	Schneider (Motor overheat control)
Hydraulic Filter (HY1-B005PS) – HL-SKT (HY1-B007PS) – feeding pump (HY1-B009PS) – manoeuvre pump	Yes 3 piece
	Oil temp <30°C Filter monitoring not Active
	Oil temp >30°C Filter monitoring Active
	OK / Warning75% / Stop100%
Oil Level sensor (HY1-B014LL)	Yes
	Full / Warning / Stop
Oil temperature monitoring (HY1-R006TE)	Yes analogue (0 – 100°C)
	Oil temp >5°C enable for feeding pump
	Oil temp >10°C enable for manoeuvre pump
	Oil temp >15°C enable for “Sequence Start” and for all manoeuvre
	Oil Temp >65°C warning Oil temp to high
	Oil temp >70°C immediate stop hydraulic unit
Outside temperature (HY1-B021TS)	Outside temp <5°C hydraulic has to be warm up by feeding pump
	Outside temp < 10°C HL-SKT has to be warm up
Oil Cooling (HY1-M004)	Yes electric fan and cooler
	Start >48°C / Stop <45°C
Emergency Mode (No power of the plant)	Yes with the emergency pump and emergency panel
Feeding Pump (HY1-M003)	Yes 1 mechanical and 1 electric motor
Pressure Valve (HY1-V001V)	Pressure Valve 230bar for movement Stop delay time 20sec
Heating Valve (HY1-V002V)	Hydraulic Oil heater
	Start <8°C / Stop >12°C
Hagglunds flushing Valve (HY1-V003V)	Warm up oil regarding oil and outside temperature conditions

- Start / Stop Hydraulic feeding pump HY1-M002	
Start conditions	Stop Conditions
- Control Power ON	- HY1-M001 Stopped stop delay (10sec)
- Start/Stop button on the Operator panel	- HY1-R006TE > 5°C
- HY1-B014LL no min Level	- HY1-B001PS Pressure > 20bar (delay time 3s)
- Start / Stop Hydraulic main pump HY1-M001	
Start conditions	Stop Conditions
- HY1-B001PS Pressure > 20bar	- Control Power OFF
- HY1-M002 Started	- HY1-B001PE no Pressure
- HY1-B021TS outside temperature > 5°C	- HY1-B001PS 100% Alarm
	- HY1-B002PS 100% Alarm
	- HY1-B003PS 100% Alarm
	- HY1-R006TE > 70°C
	- HY1-M002 not started
	- HY1-R006TE < 15°C
	- Start / Stop button on the Operator panel
- Interlocking	- "Sequence Start" possible = Hydraulic unit Started
	- Hydraulic movement possible = Hydraulic unit Started
	- "Sequence Stop" automatic = Hydraulic unit Stopped or malfunction
- Malfunction	- HY1-Q001SY local safety switch not in "ON" position
	- HY1-M001-T1 motor starter tripped
	- HY1-M001-F1 motor protecting switch tripped
	- HY1-B014LL min. oil level
	- B005PS / B007PS / B009PS filter clogging 100% Alarm
	- HY1-R006TE min. oil temp. < 5°C
	- HY1-R006TE max. oil temp. > 70°C
	- HY1-R021TS min. outside temp. < -20°C
- Effect by Malfunction	- Sequence stop and stop all part of Hydraulic unit
	- Alarm horn activated
	- Error information on Operator Panel
- Note	- By pressing one of the emergency stop buttons, the feeding pump will keep running for safety reasons.

9.5 Boom Up / Down (HY2)		
- Component		
Analogue hydraulic amplifier card	Yes VT-11118-1X	
Analogue Valve	Boom Up	(HY2-Y001V)
	Boom Down	(HY2-Y002V)
Digital Valve	Boom Up / Down	(HY2-Y003V)
	Boom Floating	(HY2-Y004V)
Rotating light for Sink IN	(HY2-A020AL)	
Flexible line monitoring	Yes Pressure switch analogue (HY2-R001PS) <4 bar Stop of Hydraulic unit	
Sink In High Level	Yes 2 digital (HY2-B010HL) /(HY2-B011HL)	
Angle monitoring (HY2-A001CU)	Yes analogue sensor (-90° - +90°)	
	Range:	
	Line "Passive"	(-30° - 45°)
	Line "HL-SKT OFF"	(-30° - 40°)
End switch Max. Up/Down	Yes 2 digital with alarm (HY2-B010LS) /(HY2-B011LS)	
conditions for start Boom Up		conditions for start Boom Down
- Control Power ON		- Control Power ON
- Hydraulic Unit Started (HY1)		- Hydraulic Unit Started (HY1)
- HY2-B010LS not activated		- HY2-B011LS not activated
- HY2-A014CU (<+30°)		- HY2-A014CU (>-20°)
- Command Boom Up		- HY2-B010HL Uncovered (High Level)
		- HY2-B011HL Uncovered (High Level)
		- Command Boom Down
conditions for start Boom Floating Start		conditions for start Boom Floating Stop
- Control Power ON		- Control Power OFF
- Hydraulic Unit Started (HY1)		- Hydraulic Unit not Started or malfunction (HY1)
- HY2-B011LS not activated		- HY1-Y001V not activated
- HY3-A014CU (>-20°) and (>-30°)		- HY3-A014CU (<-20°) or (>+30°)
- HY2-A014CU (<-30°)		- HY2-A014CU (<-30°)
- HY2-B010HL Uncovered (High Level)		- HY2-B011LS activated
- HY2-B011HL Uncovered (High Level)		- Command Kick In / Out
- Command Sink IN On		- Command Boom Up / Down

	- Command Slewing Right / Left
	- Command Travelling Right / Left
	- Command Sink IN Off
	- Line status (Fault) / (Emptying)
Function Sink IN	
Floating is activated until at least the level detectors (HY2-B010HL) /(HY2-B011HL) at the HL - SKT booth is covered with product and then the floating will be stopped automatically. It will be reactivated again if the level detectors (HY2-B010HL) /(HY2-B011HL) are free of material (with time delay of approx. 10 sec.).	
Note Sink IN	
Floating can be switched on by toggle switch either from the cable control or from radio remote control unit. Floating is a "short-circuit" between the two chambers of the luffing- and kick- cylinders which allows a controlled exchange of oil between the two chambers. Since the main-boom is balanced so that approx. 10 kn. overweight remains on the boom tip, the boom resp. marine leg will slowly move down if floating is activated - e.g. to follow the product level automatically during unloading of free-flowing products	
- Malfunction	- HY2-R001PS no Pressure
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Immediate stop of Hydraulic unit
- Note	- If Kick out angle 30° is reached it is possible to luff the boom up by pressing Boom up and Kick in at the same time until HY3-A014CU Kick angle 33° is reached.

9.6 Kick Out / In (HY3)		
- Component		
Analogue hydraulic amplifier card	Yes VT-11118-1X	
Analogue Valve	Kick Out	(HY3-Y001V)
	Kick In	(HY3-Y002V)
Digital Valve	Kick Floating	(HY3-Y003V)
Angle monitoring (HY3-A014CU)	Yes analogue sensor	(-90° - +90°)
	Range:	
	Line "Passive"	(-20° - 30°)
	Line "HL-SKT OFF"	(-20° - 30°)
End switch Max. Out/In	Line "Active"	(-20° - 25°)
	Yes 2 digital with alarm (HY3-B010LS) /(HY3-B011LS)	
conditions for start Kick Out		conditions for start Kick In
- Control Power ON		- Control Power ON
- Hydraulic Unit Started (HY1)		- Hydraulic Unit Started (HY1)
- HY3-B010LS not activated		- HY3-B011LS not activated
- HY3-A014CU (<+30°)		- HY3-A014CU (>-20°)
- Command Kick Out		- Command Kick In
Kick Floating Start		Kick Floating Stop
- Same like "Boom Floating Start" (chapter 9.5)		- Same like "Boom Floating Stop" (chapter 9.5)
- Note	- If Kick out angle 30° is reached it is possible to luff the boom up by pressing Boom up and Kick in at the same time until HY3-A014CU Kick angle 33° is reached.	

9.7 Slewing Right / Left (HY4)		
- Component		
Analogue hydraulic amplifier card	Yes VT-MSPA2-1-1x/0V/0	
Analogue Valve	Slewing Right	(HY4-Y001V)
	Slewing Left	(HY4-Y002V)
Digital Valve	Break open	(HY4-Y003V)
Rotary Indicator (HY4-A022CU)	Range:	
	End Position Right	(+180°)
	End Position Left	(+0°)
	Parking Position	(+7°)
End switch Max. Right/Left	Yes 2 digital with alarm (HY4-B010LS) /(HY4-B011LS)	
Stop switch Max. Lateral HL-SKT Right/Left	Yes 2 digital (HY1-B017LS)/(HY1-B018LS)	
conditions for start Slewing Right		conditions for start Slewing Left
- Control Power ON		- Control Power ON
- Hydraulic Unit Started (HY1)		- Hydraulic Unit Started (HY1)
- Not End Position Right (0°)		- Not End Position Left (+196°)
- HY4-B011LS not activated		- HY4-B010LS not activated
- HY4-B012LS HL-SKT Lateral not activated		- HY4-B011LS HL-SKT Lateral not activated
- HY2-B010HL Uncovered		- HY2-B010HL Uncovered
- HY2-B011HL Uncovered		- HY2-B011HL Uncovered
- Slewing Storm anchor Open (HY4)		- Slewing Storm anchor Open (HY4)
- Command Slewing Right		- Command Slewing Left
- Malfunction	- HY4-B010LS activated	
	- HY4-B011LS activated	
- Effect by Malfunction	- Alarm horn activated	
	- Error information on Operator Panel	
	- Immediate stop of Hydraulic unit	
- Note	- If the override limitation switch (HY4-B010LS) /(HY4-B011LS) is activated then reverse movement is only possible by the hydraulic emergency pump ! - The encoder HY4-A014CU activate the automatically changes to slow speed before reaching the anchor position Right / Left. - For new Calibrating check chapter 8.16	

9.8 Slewing Storm anchor Open/ Close (HY4)	
- Component	
Digital Valve	Slewing Storm Anchor Open (HY4-Y004V) Slewing Storm Anchor Close (HY4-Y005V)
Storm anchor Position switch Open	Yes 4 digital Storm Anchor Lock (HY4-B020LS) Storm Anchor Unlock (HY4-B021LS) Right Storm Anchor Lock (HY4-B022LS) Right Storm Anchor Unlock (HY4-B023LS)
conditions for Storm anchor Open conditions for Storm anchor Close	
- Control Power ON	- Control Power ON
- Hydraulic Unit Started (HY1)	- Hydraulic Unit Started (HY1)
- Slewing Storm anchor Close (HY4)	- In Parking Position (0°)(+/- 0.1°)
- Command Slewing Storm Anchor Open / Close	- Info on Operation Panel "In Parking Position"
	- Or the Rotary indicator (HY4-A022CU) forced
	- Slewing Storm anchor Open (HY4)
	- Command Slewing Storm Anchor Open / Close
- Malfunction	- Fault Storm anchor / not in the right Position
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Slewing not more possible
- Note	-If in "UNLOCKED" position either (HY4-B021-B022LS) become deactivated (due to a pressure drop in the hydraulic system), the above mentioned unlocking sequence starts automatically until both limit switches are activated again. - If one of these limit switches will be deactivated longer than approx. 10 sec. an acoustic alarm will be given and the button become flashing and error information on text display. However, as long as one of these switches is deactivated the operation „TOWER SLEWING" will be blocked. Locking is possible only if the sensors (HY4-A001CU) are in parking position.

9.9 Hoist Winch Up / Down (HY6)			
- Component			
Analogue hydraulic amplifier card	Yes VT-11118-1X		
Motor with FU	Hoist Winch Up/ Down HY6-VT-T1		
Weight monitoring (Load cell)	Yes analogue	Load cell	(0.0t – 10.0t)
	(HY6-A014CU)	real (load) weight	(0.0t – 15.0t)
	Interlocking real weight:		
	Slack rope	(<0.5t)	
	Overload	(>10.0t)	
End switch Max. Up/Down	Yes 2 digital HY6-B010LS_I1 Limit Top HY6-B010LS_I2 Limit Bottom		
conditions for start Hoist Winch Up		conditions for start Hoist Winch Down	
- Control Power ON		- Control Power ON	
- Hydraulic Unit Started (HY1)		- Hydraulic Unit Started (HY1)	
- No Overload (HY6-A014CU)		- No Slack rope (HY6-A014CU)	
- HY6-B010LS_I1LS not activated		- HY6-B010LS_I2 not activated	
- Command Hoist Winch Up		- Command Hoist Winch Down	
- Malfunction	- (HY6-A014CU) Overload Load cell		
	- (HY6-A014CU) Slack rope Load cell		
- Effect by Malfunction	- Alarm horn activated		
	- Error information on Operator Panel		
	- Stop Hoist Winch Up movement by Overload		
	- Stop Hoist Winch Down movement by Slack rope		

9.10 HL-SKT (CC1)	
- Component	
Analogue hydraulic amplifier card	VT-11118-1X (Input -10V / +10V)
Analogue Valve	CC1-Y001V HL-SKT Forward CC1-Y002V HL-SKT Revers
Heating mode HL-SKT	Oil temp <15°C → Start heating mode, set max. speed HL-SKT HL 20% Oil temp >15°C and 8 min HL-SKT Started slow speed 20% (ca. 2.5 rpm) → Stop heating mode, enable for full speed
Pressure Switch	Analogue Oil Pressure switch (HY1-R012PE)
Maximum Speed	100% = 64 rpm
Chain speed monitor (CC1-B001SM)	DD2003 Analogue Input
High Level	Maihak MBA220 (CC1-B001HL)
- Start / Stop CC1-VT-T1	
Start conditions	Stop Conditions
- Control Power ON	- Control Power OFF
- Hydraulic Unit Started (HY1)	- Hydraulic Unit not Started or Malfunction
- Line Status (HL-SKT OFF)	- Line Status not (Started)
- CC2-M001 Started (Boom Chain conveyor)	- CC1-B001HL Covered
- CC1-B001HL Uncovered (High level)	- Command "HL-SKT OFF" or "Sequence Stop"
- HY2-A014CU < 30° (Boom Position)	- Command "HL-SKT OFF" from Silo
- Command "HL-SKT ON"	
- Service HL-SKT Forwards / Backwards	
	- Set Line in Manual mode (chapter 8.6) - Select HL-SKT motor on the Operator Panel - Set the HL-SKT motor in Manual mode
- HL-SKT Forward	- Set Output Value 0 – +30% in Operator Panel - Start / Stop with the Remote Control Unit (HL-SKT ON / OFF)
- HL-SKT Backwards	- Set Output Value 0 – -15% in Operator Panel - Start / Stop with the Remote Control Unit (HL-SKT ON / OFF)
- Chain Speed	- The HL-SKT chain speed can be adjusted on the Operator Panel and Remote Control unit ("Sequence Start" + "Sink IN On" = faster / "Sequence Start" + "Sink IN Off" = slower) between 0 - 100% of a predetermined max. Chain speed.
- Malfunction	- CC1-B001HL Covered
- Effect by	- Alarm horn activated

Malfunction	- Error information on Operator Panel
- Note	- The Silo can reduce and increase the HL-SKT speed

9.11 Boom Chain Conveyor (CC2)	
- Component	
Soft starter (CC2-M001)	Schneider (Motor overheat control)
Chain Speed monitor (CC2-B001SM)	Digital Input
2 High Level	Maihak MBA220 → (CC2-B001HL) (CC2-B002HL) Digital Input
- Start / Stop CC2-M001	
Start conditions	Stop Conditions
- Control Power ON	- Control Power OFF
- Hydraulic Unit Started (HY1)	- Hydraulic Unit not Started or Malfunction
- Line Status (Ready) / (Starting)	- Line Status not (Stopping)
- CC2-B001SM healthy (Speed monitor)	- CC2-B001SM tripped
- CC2-B001HL Uncovered (High level)	- CC2-B010HL Covered (High Level)
- CC2-B002HL Uncovered (High level)	- CC2-B002HL Covered (High level)
- CC3-M001 Started (Portal Chain conveyor)	- CC3-M001 not Started (Portal Chain conveyor)
- Command "Sequence Start"	- Command "Sequence Stop"
- Malfunction	- CC2-B001HL Covered
	- CC2-B002HL Covered
	- CC2-B001SM tripped
	- CC2-Q001SY local safety switch not in "ON" position
	- CC2-S001SS local service switch not in "auto" position
	- CC2-M001 motor starter tripped
	- CC2-SS-F1 motor protecting switch tripped
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Immediate stop of CC2 (Portal Chain Conveyor)
	- Immediate stop of CC1 (HL-SKT)
	- Line Status (Fault) and after 5 min "Sequence Stop"

9.12 Portal Chain Conveyor (CC3)	
- Component	
Motor Overheat control	(CC3-R001T1-F1)
Chain speed monitor	Digital Input (CC3-B001SM)
High Level	2x Digital input (CC3-B010HL, CC3-B011HL)
- Start / Stop CC3-M001	
Start conditions	Stop Conditions
- Control Power ON	- Control Power OFF
- Hydraulic Unit Started (HY1)	- Hydraulic Unit not Started or Malfunction
- Line Status (Ready) / (Starting)	- Line Status not (Stopping)
- CC3-B001SM healthy (Speed monitor)	- CC3-B001SM tripped (Speed monitor)
- CC3-B010HL Uncovered (High level)	- CC3-B010HL Covered (High level)
- CC3-B011HL Uncovered (High level)	- CC3-B011HL Covered (High level)
- Command "Sequence Start"	- Command "Sequence Stop"
- Malfunction	- CC2-B010HL Covered (High Level)
	- CC2-B011HL Covered (High Level)
	- CC3-B001SM tripped (Speed monitor)
	- CC3-Q001SY local safety switch not in "ON" position
	- CC3-S001SS local service switch not in "auto" position
	- CC3-R001T1-F1 overheat monitor tripped
	- CC3-M001-F1 motor protecting switch tripped
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Immediate stop of CC3 (Portal Chain Conveyor)
	- Immediate stop of CC2 (Boom Chain Conveyor)
	- Line Status (Fault) and after 5 min "Sequence Stop"

9.13 Way group (WG1)	
- Component	
Flaps	Pneumatic (CC3-B001LS-Y001V, CC3-B005LS-Y005V)
Start conditions	
- Control Power ON	
- Compressed air CA1 started	
- Go Automatically in the right position (Way is selected by the operator panel)	
- Malfunction	
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Immediate stop of all chain conveyors
	- Line Status switch of (Fault) and after 5 min "Sequence Stop"

9.14 Travelling Right / Left (TM1)	
- Component	
Frequency Converter	ATV930 (TM1-36)
Travelling Storm anchor	Yes 1with digital signal Travelling Storm Anchor Open (TM1-B020LS, TM1-B040LS)
Travelling Break	Electro motor break (TM1-FC1-Q5)
Anti-collision Sensor	Yes 4 analogue sensor (TM1-B001LS) (TM1-B002LS) (TM1-B003LS) (TM1-B004LS)
Thermocouples	24x Digital input (TM1-R001TE - TM1-R032TE)
conditions for Travelling Right	conditions for Travelling Left
- Control Power ON	- Control Power ON
- Travelling Storm anchor Open	- Travelling Storm anchor Open
- Travelling Wheel brake Open (WB1)	- Travelling Wheel brake Open (WB1)
- Anti-collision Sensor Right not activated - TM1-B002LS / TM1-B004LS	- Anti-collision Sensor Left not activated - TM1-B001LS / TM1-B003LS
- CR1-M001 Started	- CR1-M001 Started
- CR1 no malfunction	- CR1 no malfunction
- Command Travelling Right	- Command Travelling Left
- The Travelling started delayed 10 sec. In this time come switch on the travelling belt and rotary signal lamp for the travelling start warning.	
- Emergency mode (TM1-FC1-T1) Defect	1. Turn the TM1-FC1-S1 switch to FC by-pass
	2. Now it's possible Travelling movement Right and Left without Frequency converter
	Attention: Start and Stop sequence without ramp The travelling speed is not more adjustable
- Malfunction	- Frequency converter Fault TM1-FC1-T1
	- Travelling Storm anchor not Open
	- Anti-collision Sensor activated
	- TM1-Q001SY Safety switch not in "ON" position
	- TM1-FC1-Q5 going not open
	- TM1-M001-F1 – TM1-M008-F1 overheat monitor tripped
	- TM1-M001-F2 – TM1-M008-F2 motor thermal relay tripped
	- TM1-FC1-F1 motor protecting switch tripped
- Effect by	- Alarm horn activated

Malfunction	- Error information on Operator Panel
	- Stop Travelling movement
9.14.1 In case of fault at Altivar ATV 930 Converter ref. to ATV 930manual	
- Brake operation:	The ATV system allows two different steps of brake down (stop) operation.
- Normal Stop	For normal operation
	Normal stop is effected by releasing of resp. Joy stick. The drive system decelerates via the integrator (ramp) in the Altivar. The drive system brakes by means of using electric motors as generators. The energy (max. 100%) is dispersed in the brake resistors.
- Emergency Stop	In case of emergency case only
	Emergency stop is affected by actuating one of the emergency-stop push buttons. The drive system stops immediately.

9.15 Wheel brake (WB1)	
- Component	
Hydraulic pump	(WB1-M001) / (WB1-M004)
Thermocouples	(WB1-R001TE) / (WB1-R041TE)
Digital Valve	Activated by "Command Rail Clamp Open" (WB1-Y001V) / (WB1- Y041V)
Limit switch	12x Digital Input (WB1-B001LS) - (WB1-B006LS) (WB1-B041LS) - (WB1-B046LS)
- Start (WB1) and Enable Travelling (TM1)	
Start conditions (WB1-M001 / WB1-M001)	Enable for Travelling (TM1) conditions
- Control Power ON	- Control Power ON
- (WB1-R0*1TE) healthy	- (WB1-R0*1TE) overheated
- (WB1*-B00*LS) no activated	- (WB1*-B00*LS) activated
- (WB1*-B04*LS) no activated	- (WB1*-B04*LS) activated
- Command Rail Clamp Open	
- Malfunction	- WB1-R001TE, WB1-R041TE Thermocouples overheated
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Stop of the relevant Rail Clamp Hydraulic pump

9.16 Cable Reel (CR1)	
- Component	
torque motor	CR1-M001
Limit position	2 Digital Input (CR1-B003LS_I3, CR1-B003LS_I4)
Cable Reel Full / Empty monitoring	2 Digital Input Full / Empty Empty = Stop Travelling / Full = In middle position ("Slap cable" not in function)
Slap cable monitoring	1 Digital Input (CR1-B006LS)
Discharge direction switch	2 Digital Input (CR1-B007LS, CR1-B008LS)
- Start (CR1) and Enable Travelling (TM1)	
Start conditions (CR1-M001)	Enable for Travelling (TM1) conditions
- Control Power ON	- Control Power ON
- No Tight Cable	- No Slap Cable
- No Slap Cable	/ Or Cable Reel Full
- Cable Reel not Full	- CR1-M001 Started
- Cable Reel not Empty	/ Or Cable Reel Full
- No Travelling End Position Right and Cable Discharge direction Left	- No Travelling End Position Right and Cable Discharge direction Left
- No Travelling End Position Left and Cable Discharge direction Right	- No Travelling End Position Left and Cable Discharge direction Right
- Command Travelling Right / Left	- No Tight Cable
	- Cable Reel not Empty
	- Command Travelling Right / Left
- Malfunction	- CR1-B003LS_I3 Limit position left
	- CR1-B003LS_I4 Limit position right
	- CR1-B003LS_I2 Cable Reel Empty activated
- Effect by Malfunction	- Alarm horn activated
	- Error information on Operator Panel
	- Stop of Travelling movement

9.17 Electro Container / Operator Cabin	
- Air Conditioning / Heater	Should the Electro-Cabin and the Operator's Cabin of the Ship-Unloader be equipped with air-conditioning and heater units, these units are foreseen in order to ensure comfortable temperatures for the Operators as well as convenient conditions for the proper functioning of the electronic components (PLC, etc.).
	The Air Conditioning and Heater units are switched on / off by thermostats (one for each room).
- Humidity	Humidity inside the panels reduces the conductivity of the contacts (oxidation on contact surface). This is why the humidity in the panels should be checked periodically.
- Dust	Dust deposits in panels and operating panels should be removed periodically. For doing this a soft brush or a vacuum cleaner can be used. The equipment for cleaning should not have any electrically conductive parts. Never use compressed air. Monitors, mimics and operating fields should be cleaned by using a rag (if necessary, use some soap and water). Never use cleaning material with solvent. When opening operating panels take care that no dirt or water penetrate into the panels. Important : Before opening panels clean outside first and before closing they clean the rubber seal.
- Note	The thermostat of the A/C units should be adjusted to ensure that cooling and heating are not in operation at the same time.