



User Manual

for Arbro heads

LOGGER Control System





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INTRODUCTION

This manual guides you through how to use the control system safely and describes how the system has been designed to be used. Please read the manual before you start using the Logger system!

All the descriptions, instructions and technical specifications concerning the Logger system in this manual are based on the latest information that was available when this manual version was created. The system is constantly being developed and therefore the manufacturer reserves the right to changes in the product without prior notice.

This user manual covers the instructions for using the Arbro stroke heads. The first section of the manual describes the system structure after which you will find detailed information on the functions controlled through the user interface.

This user manual also guides the user on how to access and tune up the variables via the user interface. The purpose of the Logger system is to make the use of the Arbro stroke heads as efficient, cost-effective and versatile as possible.

1. WARNINGS



Only trained personnel may adjust the system!

The example settings (variable values) shown in this manual are not necessarily optimal for all installations and should therefore only be used as indicative values.



BEFORE ANY MAINTENANCE ACTIVITIES DE-PRESSURIZE THE HARVESTER HEAD!



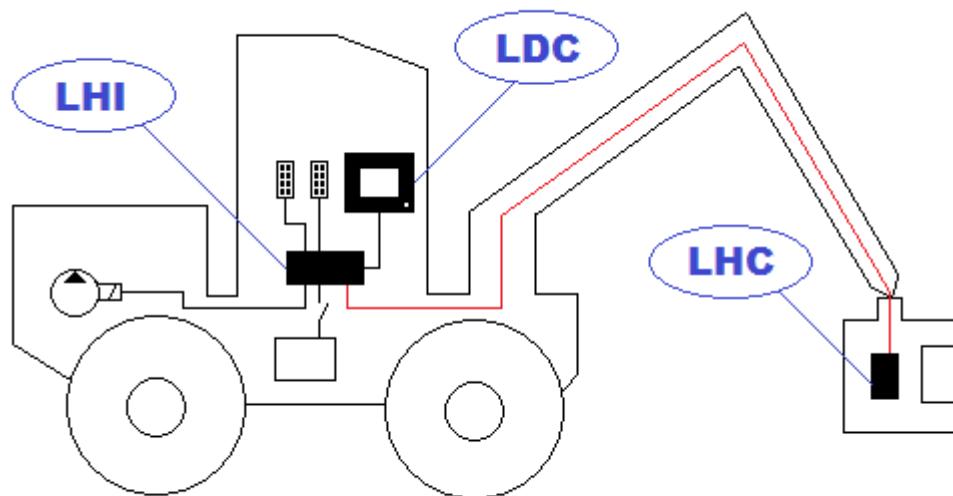
Make sure that the system is only powered through the LHI module, especially when connecting the handles!

2. SYSTEM ARCHITECTURE

The system is based on intellectual electronic control units connected via CAN-bus. The system consists of the display unit LDC (Logger Display Controller), interface module LHI (Logger Harvester Interface) and the head module LHC (Logger Head Controller).

The system can be accessed through the pulse disc switch on the display module and the switches connected to the interface module.

Control system units		
1	LDC	Logger Display Controller, cabin unit
2	LHI	Logger Harvester Interface module, connecting unit
3	LHC	Logger Head Controller, head unit



CABIN UNIT LDC



Cabin unit: Logger Display Controller LDC.

INTERFACE UNIT LHI

The system is connected through the LHI module.



Interface unit: Logger Harvester Interface module LHI.

HARVESTER HEAD UNIT LHC

This unit is located in the harvester head and it controls all the head functions.



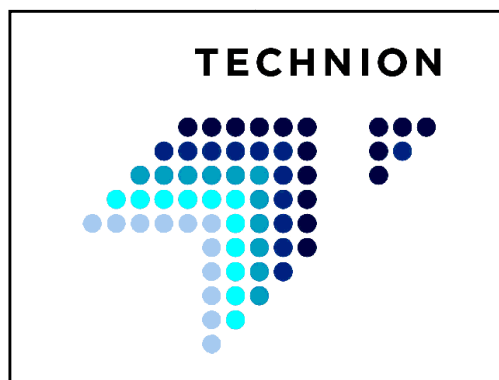
Harvester head unit: Logger Head Controller LHC.

3. GENERAL

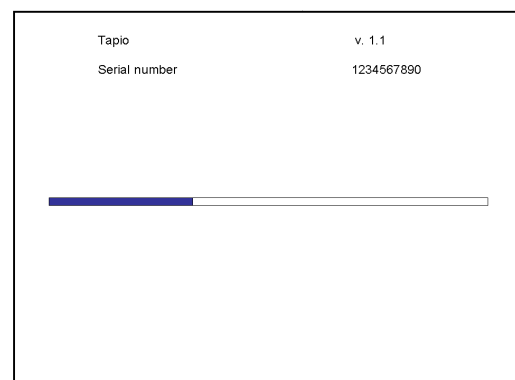
3.1. SYSTEM STARTUP

The system starts up when the LHI module is switched on. The cabin unit LDC can be switched on and off from a switch located on the right side of the display.

When the system is started the startup window appears on the screen and is followed by the initialization window, which shows the progress of the startup procedure with the help of a progress bar. The software version of the system is also indicated on the screen.



Startup window



System initialization window

The system startup takes approximately 30 seconds after switching the power on. The main screen will appear after the startup procedure.

3.2. MENU NAVIGATION

Use the pulse disc switch to navigate in the menus. By pressing the pulse disc switch (ENTER) you can activate the selected field.



Pulse disc switch / ENTER switch on the cabin unit

Navigation from the main screen to the menu section is done by selecting the menu icon in the lower right corner of the screen. In the menu section the values of the selected function or variable can be set or changed by pressing ENTER.

Returning to the previous menu is always done by pressing ENTER when the cross 'X' is selected in the upper right corner.



While in the menu section, move the cursor by turning the pulse disc switch clockwise or anticlockwise.

The selected field in the menu section is highlighted in blue:



3.3. ADJUSTING THE SETTINGS

In order to adjust the settings, the selected field must first be activated by pressing ENTER. Values can then be adjusted by turning the pulse disc switch. After the desired value has been set, it is saved by pressing ENTER. In some special cases, the value is saved by simply exiting the menu window in question. These exceptions have been mentioned separately later on in this user manual.

Besides adjusting numerical values, some settings can also be activated or deactivated. In these cases activating is done by ticking the checkbox of the desired feature with a green tick as shown below.



Feature not in use



Feature in use

When there is a need to write text, for example when defining species names or assortments, the following pop-up keyboard will appear:

Harvesting instructions

1

PINE

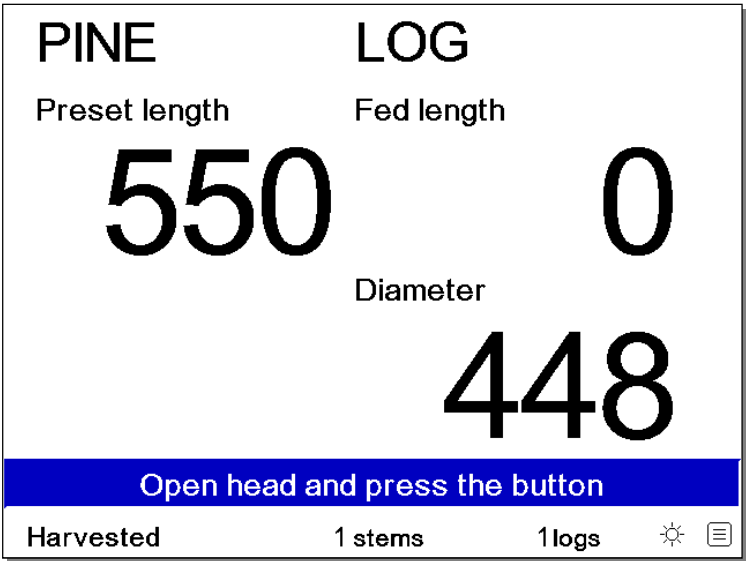
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	Å	Ä	Ö	
aA	←	CLR	Enter						
1	2	3	4	5	6	7	8	9	0

2									
3									
4									
5									
6									
7									
8									
9									
10									

4. USER INTERFACE

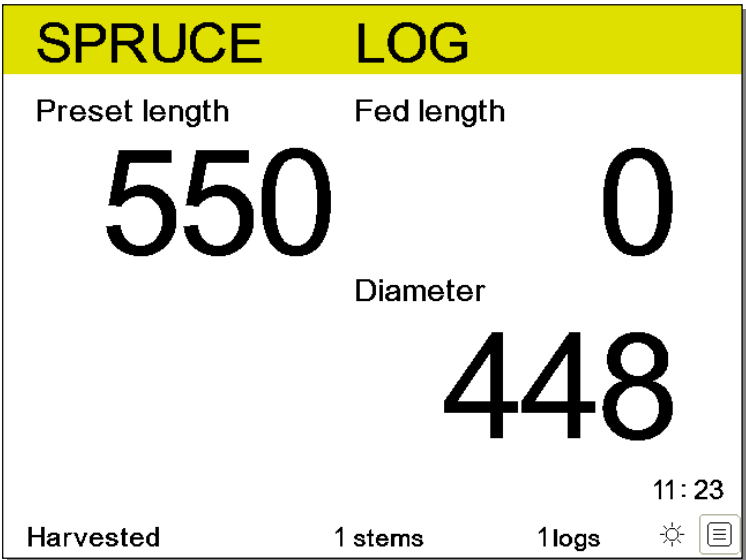
4.1. MAIN SCREEN

When the system has been started up, the main screen opens and the basic information needed to work with the application is shown on the screen.



The main screen contains several fields with various information and functions.

The first row shows the selected tree species and the assortment name. The background of this row is yellow if stump treatment has been selected:

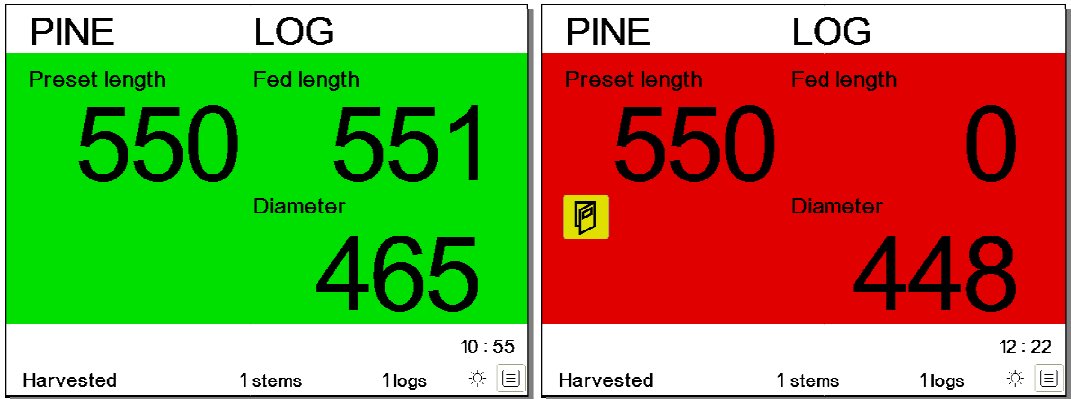


The second section describes the preselected length and actual fed length.

The Diameter value is only shown if the diameter sensor has been connected.

When the head has stopped on the desired length within the cutting tolerance, the background of the screen is green.

When the saw bar home sensor is deactivated the background of the screen is red. The system alarm symbols are also shown on this main screen.



The time is shown in the right corner of the lowest section. There are also counters for the numbers of harvested stems and logs. An icon to switch between day and night vision (brightness of the screen) is visible on the last row after the number of logs. By selecting the menu icon in the lower right corner of the main screen you will enter the main menu.

Main screen system alarm symbols:

- 
Door open
 Door switch circuit is open. All head functions and pump controls are disabled.
- 
CAN connection error
 CAN connection is cut between the cabin unit and the head unit.

Main screen function buttons:

- 
 Day/night vision selection.
 When you press Enter while this icon is selected, the display backlight brightness will change correspondingly.
- 
 Enter the main menu.

4.2. MAIN MENU

Menu
Work site
Keyboards
Settings
Service

All menu levels are accessed through this main menu.

4.2.1 MAIN – WORK SITE

In the Work site menu you can set the harvesting instructions and look at the production counters:

Work site
Harvesting instructions
Production

4.2.1.1 WORK SITE - HARVESTING INSTRUCTIONS

Harvesting instructions					
1	SPRUCE				
1	LOG	370 ... 550	150 ... 600	0 ... 3	▲ ▼
2	PULP	300 ... 500	70 ... 600	-3 ... 3	▲ ▼
3					▲ ▼
4					▲ ▼
5					▲ ▼
6					▲ ▼
7					▲ ▼
8					▲ ▼
9					▲ ▼
10					▲ ▼

In this menu you can create the assortment and length lists.

Three selected tree species can be changed from the species index number, and the species name can be edited by moving the cursor on top of the species name (SPRUCE) and then pressing Enter.

The assortment name can be added by moving the cursor to an empty field under the species name and then pressing Enter.

Diameter classes and the cutting tolerance for each assortment can be edited in the fields under the corresponding symbols as well as the butt spray.

If an assortment has not been harvested yet, arrow symbols are visible at the end of the row and the assortment can be moved up or down in the list.

The butt profile types can be accessed by selecting the arrow in the upper right corner.

SPRUCE		X
Butt profile type		
☐	Pine	
☒	Spruce	
☐	Hardwood	

This setting affects the diameter curve between the felling cut and the first actual measured point of the stem. Therefore this setting will also have an effect on the volume counting of the first log.

The length classes can be accessed and edited by selecting the length class field. Rotate the pulse disc switch on the WORK SITE – HARVESTING INFORMATION menu until the cursor is on top of the length class field and press Enter. The following screen will open:

SPRUCE		1 LOG		X			
		Butt			Butt		
1	550	0...600	▲ ▼	9	0	0...0	▲ ▼
2	520	0...600	▲ ▼	10	0	0...0	▲ ▼
3	490	0...600	▲ ▼	11	0	0...0	▲ ▼
4	460	0...600	▲ ▼	12	0	0...0	▲ ▼
5	430	0...600	▲ ▼	13	0	0...0	▲ ▼
6	400	0...600	▲ ▼	14	0	0...0	▲ ▼
7	370	0...600	▲ ▼	15	0	0...0	▲ ▼
8	0	0...0	▲ ▼	16	0	0...0	▲ ▼
☒ Log assortment		☐ Only manual selection					
☐ Free length							

In this screen you can create the length classes for the assortment selected as well as define the accepted tolerance for the butt diameter of the logs. With the small arrow symbols, you can easily change the order of the logs in the list.

Log assortment When selected, the log stems and pulp stems will be differentiated in the production report.

Additionally, the log type assortments have a higher priority than the pulp type assortments when the automatic scaling function is in use.

Only manual selection When selected, the automatic scaling function will not select this assortment.

Free length Cutting allowed between the maximum and minimum length.

4.2.1.2 WORK SITE - PRODUCTION

The Production menu includes stem and log counters, and the total volumes per species are also visible. The menu also contains buttons for printing out the production data, saving the data to a USB flash drive and resetting the counters.

Production			X
	Stems	Volume	
Pine	0 pcs	0.00 m³	
Spruce	0 pcs	0.00 m³	
Birch	0 pcs	0.00 m³	
Aspen	0 pcs	0.00 m³	
	0 pcs	0.00 m³	
	0 pcs	0.00 m³	
Total	0 pcs	0.00 m³	
			Print USB Reset Next

If you wish to see more detailed production information on screen, select the arrow from the lower right corner. The following screen will appear:

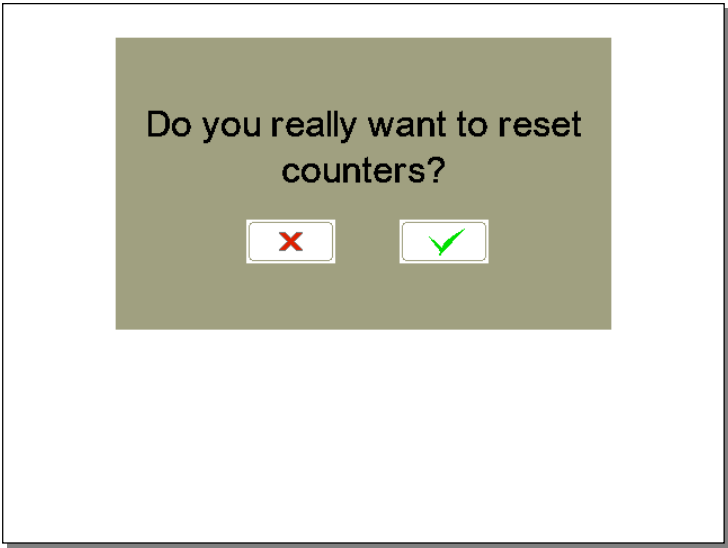
Production	1 SPRUCE					X
1 LOG	1 pcs	2.31 m	0.73	m³		
2 PULP	0 pcs	0.00 m	0.00	m³		
3	0 pcs	0.00 m	0.00	m³		
4	0 pcs	0.00 m	0.00	m³		
5	0 pcs	0.00 m	0.00	m³		
6	0 pcs	0.00 m	0.00	m³		
7	0 pcs	0.00 m	0.00	m³		
8	0 pcs	0.00 m	0.00	m³		
9	0 pcs	0.00 m	0.00	m³		
10	0 pcs	0.00 m	0.00	m³		
						▶

In this screen, select the species that you wish to examine more closely. More precise assortment-specific details can be viewed by selecting the arrow symbol in the lower right corner of the screen.

Production	SPRUCE	1 LOG					X
☒ Pieces	☐ Volumes	☐ Meters					
1 550	1 pcs 9	0	0 pcs				
2 520	0 pcs 10	0	0 pcs				
3 490	0 pcs 11	0	0 pcs				
4 460	0 pcs 12	0	0 pcs				
5 430	0 pcs 13	0	0 pcs				
6 400	0 pcs 14	0	0 pcs				
7 370	0 pcs 15	0	0 pcs				
8 0	0 pcs 16	0	0 pcs				
							

In this screen you can select between three views: the number of cut pieces, volumes or cutting meters per length class. You can also print out all the information by selecting the printer symbol. The printout will contain the volumes and running meters for all the species, assortments and length classes.

If you select Reset in the Production menu, the following screen will appear:



Select the green '✓' symbol to reset the counters or the red '✗' symbol to cancel resetting.

4.2.2 MAIN - KEYBOARDS

In the Keyboards menu you can set the functions of the buttons on handles/joysticks:

Keyboards		X
X1.3 ☐ SAWING	X1.20 ☐ TREE SPECIES 1	
X1.4 ☐ AUTOMATIC	X1.21 ☐ TREE SPECIES 2	
X1.5 ☐ FEED BACKWARD	X1.22 ☐ TREE SPECIES 3	
X1.6 ☐ FEED FORWARD	X1.26 ☐ TREE SPECIES 4	
X1.7 ☐ HEAD CLOSE	X1.27 ☐ ASSORTMENT 1	
X1.8 ☐ HEAD OPEN	X1.28 ☐ ASSORTMENT 2	
X1.9 ☐ GRAPPLE OPEN	X1.29 ☐ ASSORTMENT 3	
X1.10 ☐ FRONT KNIVES OPEN	X1.30 ☐ ASSORTMENT 4	
X1.11 ☐ STROKE OUT	X1.31 ☐ UP	
X1.12 ☐ STROKE IN	X1.32 ☐ DOWN	
X1.13 ☐ ROTATOR LEFT	X1.33 ☐ REJECT	
X1.14 ☐ ROTATOR RIGHT	X1.34 ☐ UP NEAREST	
X1.16 ☐ TILT UP	X1.35 ☐ DOWN NEAREST	
X1.18 ☐ TILT DOWN	X1.36 ☒ DOOR SWITCH	

All the buttons that can be programmed are shown on the screen. Choosing is possible only between those functions that are used on the head-specific application making it simpler to select. The buttons are named after the pin location on the LHI connection module.

The location of some of the inputs is fixed for safety reasons. The functions of these buttons cannot be changed. The highlighted field will jump over these fixed inputs/buttons when you turn the pulse disc switch.

To programme the buttons, move the highlighted field to the desired input/button and press ENTER. This will enable you to select from predefined functions by turning the pulse disc switch. Select the desired function by pressing ENTER.

Programmed inputs will be saved to the memory when you exit the window.

The round symbol to the left of the function name turns green when the particular input is pressed in the cabin. This helps the operator to check which button is being programmed.

4.2.3 MAIN - SETTINGS

In the Settings menu you set all the parameters for the Logger system:

Settings	X
Usage settings	
Harvester head settings	
Save settings to USB	
Read settings from USB	
Factory setups	

4.2.3.1 SETTINGS - USAGE SETTINGS

The language to be used is chosen in the Usage settings menu. Here you can also set the date, time and working methods for harvesting.

Usage settings
Language
Date/Time settings
Scaling

Language
☒ English EN
☐ Suomi FI
☐ Deutsch DE
☐ Svenska SV

Date/Time settings
Date 17 . 8 . 2011
Time 12 : 02

All the available language versions are listed in the Language screen. There is a green tick in the checkbox of the selected language:



The desired language can be selected by turning the pulse disc switch until the correct language is highlighted and then pressing ENTER.

In the Date/Time settings window you can set the date and time by using the pulse disc switch as described earlier in this manual.

The third submenu in the Usage settings menu is Scaling:

Scaling		X
Automatic scaling		☐
Default tree species	PINE	☒

Automatic scaling When selected, automatic scaling is used.

Default tree species When this setting is ticked, the default species will automatically be selected once the handling of the previous stem has ended.

4.2.3.2 SETTINGS - HARVESTER HEAD SETTINGS

In the Harvester head settings menu you set all the parameters for controlling the head functions and base machine pumps:

Harvester head settings	X
Feed	
Rotator	
Pumps	
Measurement	

HARVESTER HEAD SETTINGS - FEED

Feed			X
	↔	→ ←	
Front knives	0.04	0.05 s	
Grapple	0.04	0.05 s	
Automatic feed activation with button			☒
Automatic feed activation after cutting			☒
			
Braking distance	20	20 cm	
Seek pulse	0.06	0.06 s	
Processor mode			☐

Front knives ↔ Time setting for opening pulse when stroke out starts.
→ ← Delay for the feeding after the closing pulse when stroke in limit has been reached.

Grapple ↔ Time setting for opening pulse when stroke in starts.
→ ← Delay for the feeding after the closing pulse when stroke in limit has been reached.

Automatic feed activation with button not selected/selected

Setting for selecting automatic feeding.
When selected, the start command must be given by pressing the species or assortment button after felling.
If this setting is not selected, automatic feeding does not start with any button.
It is also possible to use the so called Valmet mode automatic feeding by programming a preset key with the function 'automatic'. Even with the Valmet mode in use, sawing never starts automatically and always requires pressing the sawing button.

Note! The feeding button never starts the automatic feeding function.

**Automatic feed activation after cutting** not selected/selected

When selected, automatic feeding starts after each cross cutting, never after felling.

Braking distance

The feeding function is switched off when this close (a few cm) to the middle of the cutting tolerance. Different values for feeding forward and backwards because of the different speed of the movement.

Seek Pulse

Time setting for the control pulse, if not stopped straight inside the cutting tolerance.

Processor mode not selected/selected

Stems are automatically started with the sequence HEAD OPEN – HEAD CLOSE – CUT without a need to tilt up when this setting is selected. (Simulates the felling procedure.)

HARVESTER HEAD SETTINGS - ROTATOR

Rotator 				
	Min %	Max %	 s	 s
	100	100	0.10	0.10
	100	100	0.10	0.10



Rotator control right (clockwise).



Rotator control left (anticlockwise).

Rotator control speeds and ramps

Min %

Minimum speed

range: 0 – 100 %

Max %

Maximum speed

range: 0 – 100 %

 s

Acceleration ramp

range: 0 – 1.00 s.

 s

Deceleration ramp

range: 0 – 1.00 s.

HARVESTER HEAD SETTINGS - PUMPS

The control system has two outputs to control hydraulic system pressure.

Pumps ✕		
	1	2
Feed	50 %	☒
Cutting	43 %	☒
Rotator	20 %	☒
Auxiliary controls	20 %	☒
Base level	20 %	☒
Base level hold time	5.0 s	1.0 s

All the control level adjustments can be set between 0 – 100 % if the output control type is proportional. If the output control type is of on/off type, the control level adjustments can be set to not selected or selected.

Feeding

Control level when feeding is activated.

Cutting

Control level when the saw motor is running.

Rotator

Control level when using rotator.

Auxiliary controls

Control level when using auxiliary controls.

Base level

Control level when any other head function is activated.

Base level hold time

range: 0 – 20.0 s

Keeps the base level after all the head functions are switched off.

When several functions are active at the same time, the highest value is used.

HARVESTER HEAD SETTINGS - MEASUREMENT

In this menu, the sensor pulse count is defined.

Measurement		X
Length	- 10 mm	- 2 pcs
Pulse amount of 100 cm	200 pcs	
Diameter	0 pcs	
Head open-close pulse amount	450 pcs	
Diameter base curve	▶	
Init diameter base curve		
Tapio 280	☒	Tapio 400 ☒

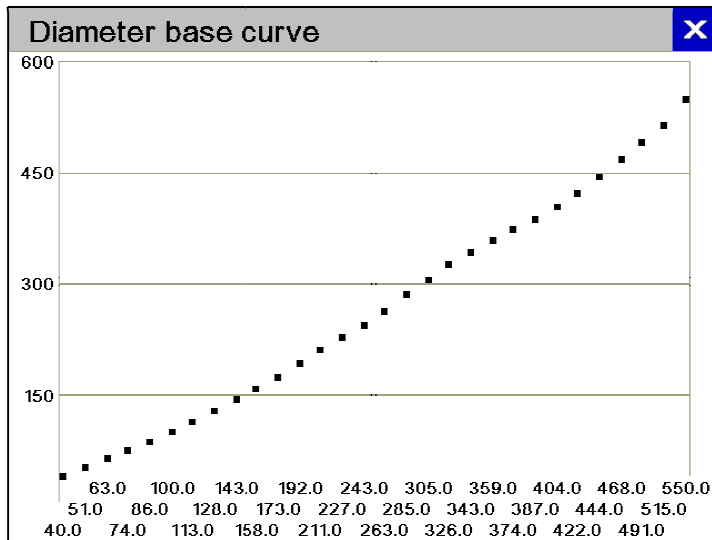
Length: how many pulses are received per one meter distance

The grey number indicates the actual pulse count coming from the sensor and the black value is the setting for how many pulses are coming per one meter distance. When the value (200 pcs in the picture) is raised, the actual length of the fed log will become longer and vice versa.

Diameter: pulse count during HEAD OPEN – HEAD CLOSE sequence

The grey number indicates the actual pulse count coming from the sensor and the black value is the setting for pulses during the open - close sequence.

Diameter curve values can be manually adjusted on this screen.



Init diameter base curve:

User can set basic calibration values by choosing either Arbro 400 or Arbro 1000 harvester head.

4.2.3.3 SETTINGS – SAVE THE SETTINGS ON USB FLASH DRIVE

This menu allows you to save the settings and parameters of the Logger system into a USB flash drive, which means that you can download them back to the system, for example after a change of a module.



Saving of the settings and parameters:

1. Connect the USB flash drive into the USB connector of the display
2. Select a name for the file to be saved by moving to the location for file name and pressing ENTER. The default name for the file is a timestamp of the form MMDDhhmm.par. You are not required to change it.
3. Press ENTER where the green mark is.

The settings will have been successfully saved once the screen returns back to the menu's Save the settings on USB flash drive.

Read settings from USB	
Keyboards	☐
Length calibration	☒
Diameter calibration	☐
Harvester head settings	☐
Input/Output settings	☐
System settings	☐
Read file	☒

Downloading of the settings and parameters:

1. Connect the USB flash drive into the USB connector of the display.
2. Select the settings required from the USB flash drive by ticking the boxes on the respective rows with the green tick symbol. (previous image)
3. Go to the option Select the file and press ENTER. (previous image)
4. Select the downloadable PAR file from the USB flash drive and press ENTER. (following image)
5. Once the OK text has appeared on the screen to indicate that the downloading of the settings has been successful, press ENTER.

[illegible]

4.2.3.4 FACTORY SETUPS

In the Factory setups, the maintenance personnel can make the basic settings for head functions. You should not need to change these settings during normal harvesting work.

Factory setups	X
Equipment	
Current and ramp settings	
Other settings	

FACTORY SETUPS - EQUIPMENT

These settings define the harvester head and base machine outfitting.

Equipment	
☐	Stump treatment
☐	Auxiliary controls
☒	on/off type Pump 1 control
☐	on/off type Pump 2 control
☐	Proportional rotator input
☒	DPU-414
☐	Kyoline

Stump treatment

This should be selected if you need to spray the stumps.

Auxiliary controls

This should be selected if you need to use two extra outputs from the LHI module instead of using them as digital inputs for presets.

on/off type Pump 1 control

Must be selected if the Pump 1 output is controlling an ON/OFF type valve.

on/off type Pump 2 control

Must be selected if the Pump 2 output is controlling an ON/OFF type valve.

Proportional rotator input

Stepless rotation of the head if the control valve of the rotator is proportional (the speed of the function depends on how the button is pressed; button fully depressed > full speed). Select this setting if the rotator is controlled through a proportional input.

DPU-414/Kyoline

Printer selection.

FACTORY SETUPS – CURRENT AND RAMP SETTINGS

In this screen you can limit the maximum and minimum current for the proportionally controlled pumps as well as set the minimum ramp times for changing the control values between minimum and maximum values.

Current and ramp settings					X
	Min	Max	↗ s	↘ s	
Pump 1	0 %	100 %	0.10	0.10	
Pump 2	0 %	100 %	0.10	0.10	

FACTORY SETUPS – OTHER SETTINGS

The rest of the settings affecting the working modes can be set in this screen.

Other settings		X
Head open resets length delay	0.5 s	
Head open ends stem delay	0.5 s	
From saw to measurement	200 mm	
Saw start delay	0.25 s	

Head open resets length delay

This setting allows you to open the head for the set time without resetting the length measure.

Head open ends stem delay

This setting allows you to open the head for the set time without ending the stem.

From saw to measurement

The distance between the saw bar and the diameter sensor locations.

Saw start delay

If this setting is not zero, the pumps are activated first and after this set time, the sawing is started.

FACTORY SETUPS – INIT HARVESTING INSTRUCTIONS

By pressing Init harvesting instructions user is able to set the basic length and diameter settings for Harvesting instructions.

Settings are:

Pine	Log	370 400 430 460 490 520 550	min top diam. 150 mm
	Pulp	300 500	min top diam. 70 mm
Spruce	Log	370 400 430 460 490 520 550	min top diam. 150 mm
	Pulp	300 500	min top diam. 70 mm
Birch	Log	370 400 430 460 490 520 550	min top diam. 150 mm
	Pulp	300 500	min top diam. 70 mm
Aspen	Log	370 400 430 460 490 520 550	min top diam. 150 mm
	Pulp	300 500	min top diam. 70 mm

MAIN - SERVICE

Service	X
Grabbing	
Tilt	
Cutting	
Feed	
Rotator	
Auxiliary controls	
System Information	

Function-specific screens can be accessed through the Service menu.

In the separate service screens, inputs are listed first. After each input you can see the status of the corresponding output. Each row can also contain the value of the function (if it can be measured) and the name and location of the function (cabin/head module). The location can be shown at pin level if the pin location for that function is fixed.

Service windows are part of the system diagnostics where the function status is described using the drawn symbols below:



Signal ON



Signal OFF



Error state

SERVICE – GRABBING

Status of the grapple controls is shown on the screen:

Grabbing		X
☐	FRONT KNIVES OPEN	Head X2.33
☐	FRONT KNIVES CLOSE	Head X2.32
☐	DECREASED PRESSURE	Head X2.19
☐	GRAPPLE OPEN	Head X2.31
☐	GRAPPLE CLOSE	Head X2.30
☐	PUMP 1	☐ PUMP 2

SERVICE – TILT

Status of the tilt controls:

Tilt		X
☐	TILT UP	Head X2.22
☐	TILT DOWN	Head X2.23
☐	PUMP 1	☐ PUMP 2

SERVICE – CUTTING

Status of the cutting controls:

Cutting		X
☐	SAW MOTOR	Head X2.2
☐	STUMP TREATMENT	Cabin X1.19
☐	SAW AT HOME	Head X1.8
☐	PUMP 1	☐ PUMP 2

SERVICE – FEED

Status of the feed controls:

Feed		X
☐	STROKE OUT	Head X2.27
☐	STROKE IN	Head X2.26
☐	SPEED UP	Head X2.21
☐	STROKE SENSOR	Head X1.1
☐	PUMP 1	☐ PUMP 2

SERVICE – ROTATOR

Status of the rotator controls:

Rotator		X	
☐	ROTATOR RIGHT	Head X2.29	
☐	ROTATOR LEFT	Head X2.28	
☐	PUMP 1	☐	PUMP 2

SERVICE – AUXILIARY CONTROLS

Status of the auxiliary controls:

Auxiliary controls		X	
☐	AUXILIARY 1	Cabin X1.16	
☐	AUXILIARY 2	Cabin X1.18	
☐	PUMP 1	☐	PUMP 2

These outputs can be used as on/off controls to any control needs in the cabin. Wiring is done from the LHI module.

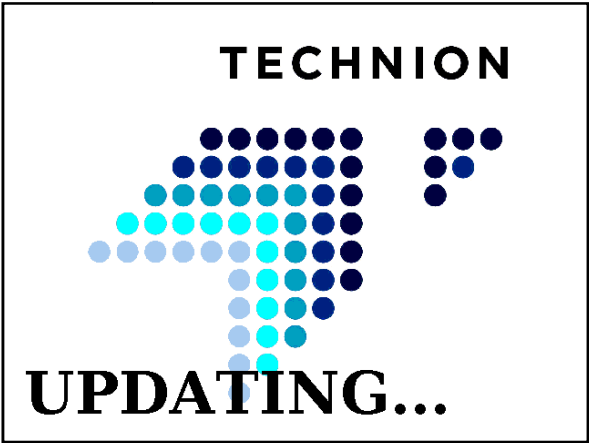
SERVICE – System information

System Information					X
Cabin		Serial number:		1328523658	
Versions:	SW:	2.1	FW:	1.45	
Head		Serial number:		1334819759 	
Versions:	SW:	208.229	FW:	0.25 Boot: 0.18	
Supply voltage		9.26 V			

5. SOFTWARE UPDATE

In order to update the software, switch off the cabin unit and connect the USB memory stick including the software package to its slot on the bottom edge of the cabin unit (display). Switch on the cabin unit and the system will automatically update the software. A screen with details about the progress of the update process will appear on the display. Once the software update is complete, the system will start automatically. To remove the USB memory stick, switch off the cabin unit first.

Note! Remove the USB memory stick from the slot before starting!



APPENDIX 1 – LHI CONNECTOR TABLE

LHI Logger Harvester Interface module	
15 pin button input connector	
Pin	Function
+10V	Reference power supply for buttons
GND	Ground
X1-3	SAWING
X1-4	PROGRAMMABLE BUTTON INPUT
X1-5	PROGRAMMABLE BUTTON INPUT
X1-6	PROGRAMMABLE BUTTON INPUT
X1-7	PROGRAMMABLE BUTTON INPUT
X1-8	PROGRAMMABLE BUTTON INPUT
X1-9	PROGRAMMABLE BUTTON INPUT
X1-10	PROGRAMMABLE BUTTON INPUT
X1-11	PROGRAMMABLE BUTTON INPUT
X1-12	PROGRAMMABLE BUTTON INPUT
X1-13	PROGRAMMABLE BUTTON INPUT
X1-14	PROGRAMMABLE BUTTON INPUT
X1-21	PROGRAMMABLE BUTTON INPUT
14 pin button input connector	
Pin	Function
+10V	Reference power supply for buttons
GND	Ground
X1-26	PROGRAMMABLE BUTTON INPUT
X1-27	PROGRAMMABLE BUTTON INPUT
X1-28	PROGRAMMABLE BUTTON INPUT
X1-29	PROGRAMMABLE BUTTON INPUT
X1-30	PROGRAMMABLE BUTTON INPUT
X1-31	PROGRAMMABLE BUTTON INPUT
X1-32	PROGRAMMABLE BUTTON INPUT
X1-33	PROGRAMMABLE BUTTON INPUT
X1-34	PROGRAMMABLE BUTTON INPUT
X1-35	PROGRAMMABLE BUTTON INPUT
X1-22	PROGRAMMABLE BUTTON INPUT
X1-20	PROGRAMMABLE BUTTON INPUT

LHI Logger Harvester Interface module	
7 pin boom cable connector	
Pin	Function
+24V	LHC power supply; voltage
+24V	LHC power supply; voltage
GND	LHC power supply; ground
GND	LHC power supply; ground
CAN H	LHC CAN HIGH
CAN L	LHC CAN LOW
SHLD	CAN shield of the boom cable
4 pin power in connector	
Pin	Function
+BATT	System power supply; voltage in
+BATT	System power supply; voltage in
GND	System power supply; ground
GND	System power supply; ground
12 pin output connector	
Pin	Function
+6.5V	DPU 414 printer power
+10V	Door switch reference power supply
GND	
GND	
X1-36	DOOR SWITCH INPUT
X1-15	PUMP 1 OUTPUT
X1-17	PUMP 2 OUTPUT
X1-15A	PUMP 1 0-5V OUTPUT
X1-17A	PUMP 2 0-5V OUTPUT
X1-16	PROGRAMMABLE BUTTON INPUT/ AUXILIARY CONTROL 1
X1-18	PROGRAMMABLE BUTTON INPUT/ AUXILIARY CONTROL 2
X1-19	STUMP TREATMENT OUTPUT

APPENDIX 2 – LHC CONNECTOR TABLE

LHC Logger Head Controller	
26 pin connector	
Pin	Function
X1-1	DI STROKE SENSOR (PNP)
X1-2	FI DIAMETER A (PNP)
X1-3	FI DIAMETER B (PNP)
X1-4	
X1-5	
X1-6	FI LENGTH B
X1-7	FI LENGTH A
X1-8	DI SAW AT HOME
X1-9	
X1-10	
X1-11	
X1-12	
X1-13	
X1-14	GND
X1-15	
X1-16	
X1-17	
X1-18	
X1-19	CAN LOW
X1-20	GND
X1-21	GND
X1-22	VCC power supply for electronics
X1-23	
X1-24	
X1-25	
X1-26	CAN HIGH

LHC Logger Head Controller	
34 pin connector	
Pin	Function
X2-1	
X2-2	DO SAW MOTOR
X2-3	DO SAW BLADE OUT
X2-4	
X2-5	
X2-6	
X2-7	
X2-8	
X2-9	VCC power supply for outputs
X2-10	DO STROKE OUT 2
X2-11	DO STROKE IN 2
X2-12	
X2-13	
X2-14	
X2-15	
X2-16	
X2-17	
X2-18	
X2-19	DO DECREASED PRESSURE
X2-20	
X2-21	
X2-22	DO TILT UP
X2-23	DO TILT DOWN
X2-24	
X2-25	
X2-26	DO STROKE IN 1
X2-27	DO STROKE OUT 1
X2-28	
X2-29	
X2-30	DO GRAPPLE CLOSE
X2-31	DO GRAPPLE OPEN
X2-32	DO FRONT KNIVES CLOSE
X2-33	DO FRONT KNIVES OPEN
X2-34	VCC power supply for outputs