

**OPERATORS MANUAL
FOR THE
LH 500 COMBINE MONITOR**

LH. No. 020-522-UK Version 1.00

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INTRODUCTION

Thank you for choosing an LH Agro product.

Your new LH 500 Combine monitor is an advanced, but easy to operate product that has been designed to serve you faithfully for many years.

Using the monitor is simple thanks to the menu based structure. Most settings have a descriptive text shown on the screen, which makes this operator's manual, more or less redundant – think of this manual as a reference when encoding the various settings.

We do however recommend using the manual when sitting in front of the LH 500 Combine monitor before work commences to familiarise yourself with the computer and the how to operate it.

We have endeavoured to deliver a fault free product. To ensure optimal use of the equipment we ask that great attention be paid when reading the manual. We are more than happy to help should any queries arise, both when the product is used for the first time and at any later date. Regarding responsibility for use of the product we refer to our sales and delivery terms especially paragraph 7, which follows:

7. Product usage.

7.1 Any use of the product is at the sole risk of the buyer. The buyer is therefore not entitled to any form for compensation caused by, for example, any of the following:

- Disturbance to/from any electronic services or products that do not confirm to the standards for CE marking,
- Missing or poor signal coverage or a succession hereof from external transmitters/receivers, used by the buyer,
- Functional faults, which apply to or from a PC-program or PC-equipment, not delivered by the seller,
- Faults that may arise from the buyers negligence to react to warnings and fault messages from the product, or which can be traced to negligence and/or absent constant control of the work carried out in comparison to the planned job.

7.2 When implementing any new equipment the buyer must take great care and pay attention. Any doubts as to correct operation/use should result in contacting the sellers service department.

This manual may not be altered, copied or manipulated in any way. Unoriginal manuals can lead to operational faults damaging machines or crops as a consequence thereof. LH Technologies Denmark ApS can therefore not be held responsible for damages incurred, which can be traced to the use of unoriginal or manipulated manuals. Original manuals can be requisitioned at any time from your dealer.

With regards

LH Technologies Denmark ApS

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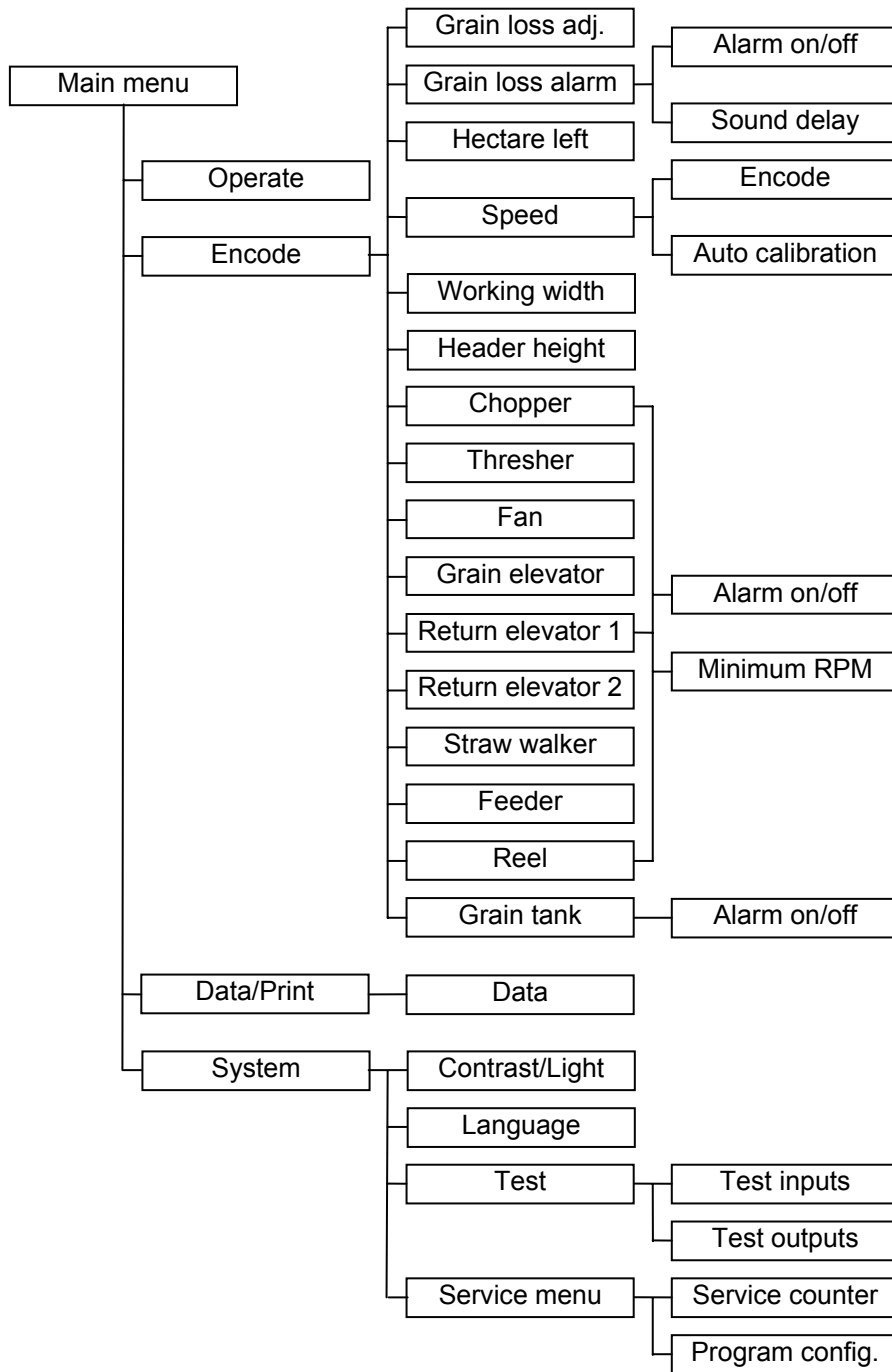
Tel. +45 96 96 25 00

Fax. +45 96 96 25 01

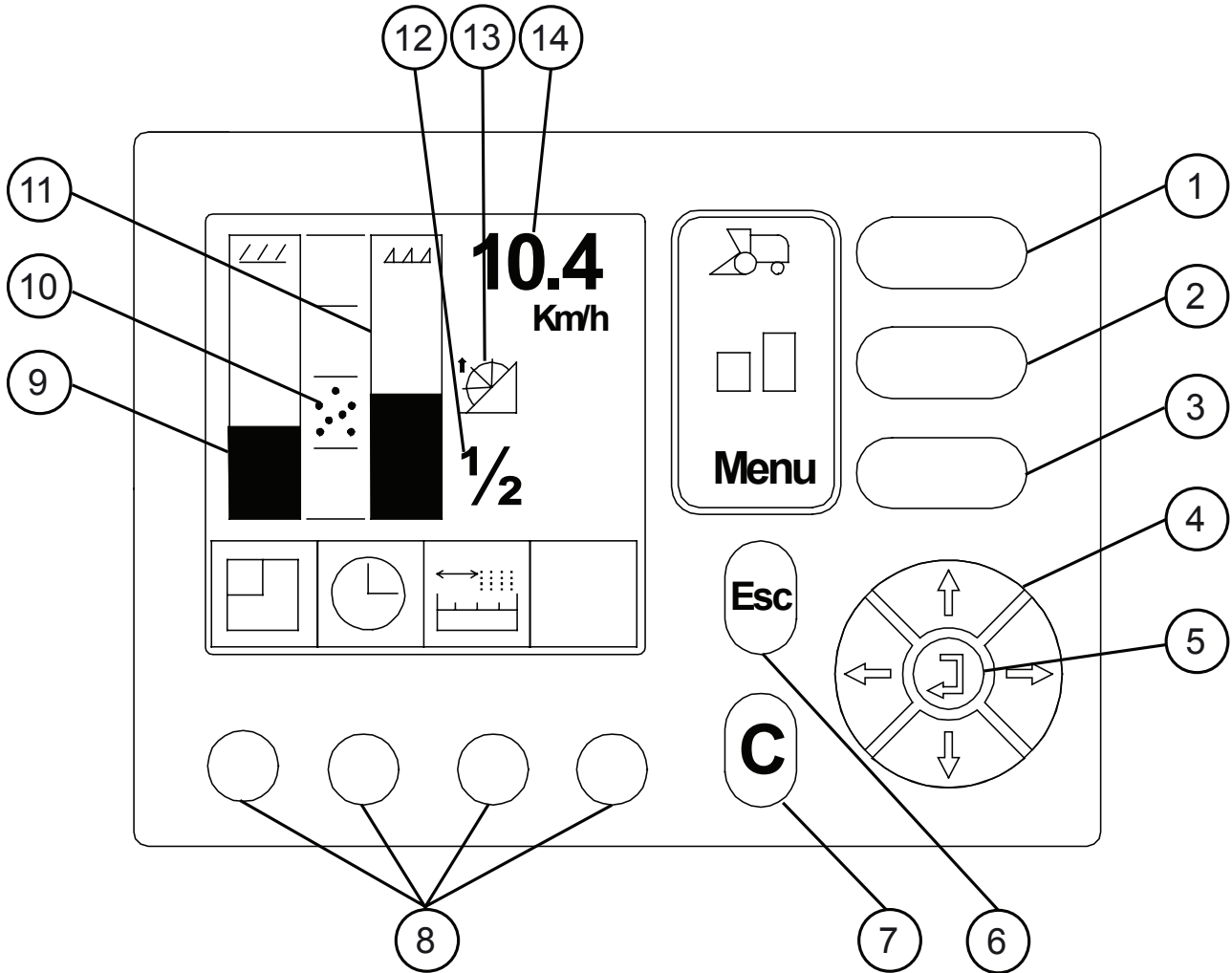
Internet: <http://www.lh-agro.com/>

OVERVIEW

PROGRAM OVERVIEW




COMPUTER OVERVIEW




Pos.	Description	Pos.	Description
1	Combine info key	8	User selectable function keys
2	Zoom key	9	Sieve grain loss indicator bar
3	Menu key	10	Grain tank level indicator
4	Arrow keys	11	Walker grain loss indicator bar
5	Enter key	12	Reduced working width indicator
6	Escape key	13	Header raised indicator
7	Clear key	14	Forward speed

COMBINE INFO KEY (POS. 1)

Key	Description
	Pressing this key displays the combine information screen which is described on page 13.

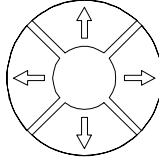
ZOOM KEY (POS. 2)

Key	Description
	Pressing the zoom key once will increase the size of the grain loss indicator bars (pos. 9 & 11) for improved readability. Pressing this key again will return to the normal operating screen. When the operating screen is “zoomed” the function keys (pos. 8) are not displayed.


MENU KEY (POS. 3)

Key	Description
Menu	The computer alternates between the operating screen and the main menu each time this key is pressed. The key has a toggle function so if the operating screen is shown and the key is pressed the main menu will be displayed instead and visa versa. If the key is pressed whilst, e.g. encoding, the operating screen will be displayed.

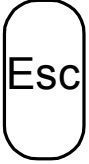
ARROW KEYS (POS. 4)

Key	Description
	The arrow keys are used to select and alter a setting. The UP and DOWN arrow keys are also used to move the cursor in the operating screen, which allows moving between the 2 selectable operating functions.

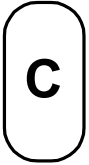
ENTER KEY (POS. 5)

Key	Description
	The enter key is used to accept settings and to return to the previous screen.


ESCAPE KEY (POS. 6)

Key	Description
	Use this key to return to the previous menu without saving the value.

CLEAR KEY (POS. 7)

Key	Description
	The clear key is used to reset settings/counters and to clear warnings.

FUNCTION KEYS (POS. 8)

Key	Description
 key 1 - 4	The function of these four keys is shown in the display directly above the key and will change depending on which mode the computer is in (soft-keys). A description of the main operating functions these keys represent can be seen on page 13

SIEVE LOSS INDICATOR BAR (POS. 9)

The sieve loss indicator bar shows an indication of grain loss measured by the sensor over the sieves in percent of the calibrated range. The higher the black bar the greater the loss and the lower the black bar the lower the loss.

Grain loss over the sieves normally means incorrect fan speed or possible blockages.

Make a habit of starting with too much air on the sieves (higher fan speed) as it is easier to reduce the fan speed until the grain loss level is acceptable than it is to increase the fan speed until loss appears. Combine capacity is reduced when the fan speed is too low.

GRAIN TANK LEVEL INDICATOR (POS 10)

The grain tank level indicator shows, in four steps, how much grain is in the grain tank.

WALKER LOSS INDICATOR (POS 11)

The walker loss indicator bar shows an indication of grain loss measured by the sensors at the end of the straw walkers in percent of the calibrated range. The higher the black bar the greater the loss and the lower the black bar the lower the loss.

Grain loss over the straw walker is normally a matter of the combine harvester being driven too fast.

REDUCED WORKING WIDTH INDICATOR (POS. 12)

Each time the “reduce working width” function is used (see page 14) an indication of this is shown on the display.

HEADER RAISED INDICATOR (POS. 13)

When the header is above the set height (see page 18) and area counting is stopped this symbol is shown in the display.

FORWARD SPEED INDICATOR (POS. 14)

The current forward speed shown in kilometres per hour with one decimal.

OPERATION

COMBINE INFORMATION SCREEN

When the combine information key is pressed (pos. 1) the following information is displayed:


Chopper speed	Thresher speed	Fan speed
Grain elevator speed	Return elevator 1 speed	Return elevator 2 speed
Straw walker speed	Feed auger speed	Reel speed

All of the above speeds are shown as RPM.


THE USER SELECTABLE FUNCTIONS

Pressing one of the user selectable function keys (pos. 8). The available functions are described in the following:


AREA FUNCTIONS

Key	Description
	Pressing the Area function key displays the following area functions:
	Ha/H: The current area being covered per hour. This is calculated from the current working width and present forward speed.
	Ha: The total measured area since the start of the task or since the last reset. See "Data/Delete" on page 19.
	Ha-left: The area remaining in the field. This is the encoded area left (see page 17) minus the area covered so far.
	Pressing any one of the above keys will show the function in the top right-hand side of the display.

TIME FUNCTIONS

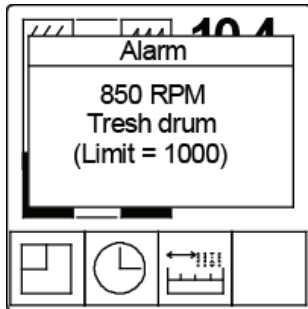
Key	Description
	<p>Pressing the time function key displays the following functions:</p> <p>Start: Pressing this key starts the stopwatch. When the stopwatch is running the time can be seen in the top right-hand corner of the display.</p> <p>The function of this key changes to “Stop” when the stopwatch is running. To stop the stopwatch simply press the “Stop” key.</p> <p>End: Pressing this key displays the time remaining for the current field based on the current working width, present forward speed and the encoded HA Left. This is shown at the top right-hand corner of the display.</p>

REDUCED WORKING WIDTH FUNCTION

Key	Description
	<p>Each press of this key cycles through the following and changes the reduced working width indicator (pos. 12):</p> <p>3/4: The encoded working width is reduced by ¼.</p> <p>1/2: The encoded working width is reduced by ½.</p> <p>1/4: The encoded working width is reduced by ¾.</p> <p>Press the key once more and the full working width will be used.</p>

WARNINGS

Situations can arise that cause a warning to be given during operation. An example of a warning given by the system can be seen in the following:



The various warnings can be cancelled by pressing the “C” key.

The description and procedure for setting the different warnings can be seen on page 18.

The reason for the given warning should be checked thoroughly before cancelling the warning!

SETTINGS

GRAIN LOSS ADJUSTMENT

This function is used to adjust grain loss to an appropriate level (50% of full signal). The procedure for grain loss adjustment is as follows:

1. Adjust the combine settings as normal.
2. Find the maximum forward speed with an acceptable grain loss level.
3. Select the sieve sensor by pressing function key 1 (pos 8. 1st key from the left).
4. Using the ARROW UP and ARROW DOWN keys adjust the indicator level so that the black bar is approx. half way up the column.
5. Note the value shown at the top of the column for future reference with the current grain type.
6. Select the straw walker sensors by pressing function key 2 (pos 8. 2nd key from the left).
7. Repeat steps 4 and 5 for the straw walker sensor.

Grain loss adjustment should be carried out whilst harvesting and check each time the grain being harvested is changed.

GRAIN LOSS ALARM

Encode whether the grain loss alarm is switched on or off.

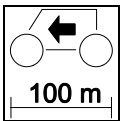
The delay before the alarm sound when excessive losses occur is encoded in seconds (standard = 5 seconds).

HA LEFT

Encode the area of the field before work commences. This area is used for calculating END TIME and for the area left function described on page 13).

SPEED CALIBRATION

The procedure to automatically calibrate the forward speed sensor is as follows:

Step/Key	Description
1	Measure a 100 metre stretch in the field and drive to the start mark.
2	 Press this key from the speed calibration menu. A START and STOP key will be shown.
3	Press the START key and drive the 100 metre stretch. Stop exactly at the stop mark. <i>The LH 500 Combine monitor counts pulses whilst the machine is driving.</i>
4	Press the STOP key and the calibration procedure is finished.

If the calibration value (number of pulses per 100 m) is known then this can be encoded directly.

WORKING WIDTH

Encode the total header width in centimetres.



HEADER HEIGHT ADJUSTMENT

Raise the header to the height at which area counting should be stopped then press the RETURN key.

The current output from the header height sensor is shown in the display during calibration.

WARNINGS

The following audible and visual warnings can be encoded:

Key	Description
	Warning on.
	Warning off.

- Chopper:** Warning for minimum chopper speed, plus warning on/off.
- Thresher:** Warning for minimum thresher speed, plus warning on/off.
- Fan:** Warning for minimum fan speed, plus warning on/off.
- Grain elevator:** Warning for minimum elevator speed, plus warning on/off.
- Return elevator 1:** Warning for minimum elevator speed, plus warning on/off.
- Return elevator 2:** Warning for minimum elevator speed, plus warning on/off.
- Straw walker:** Warning for minimum walker speed, plus warning on/off.
- Feed auger:** Warning for minimum auger speed, plus warning on/off.
- Reel:** Warning for minimum reel speed, plus warning on/off.
- Grain tank:** Warning on/off for grain tank level.

We recommend switching off any warnings that are not used.

DATA/DELETE

SHOWING THE TRIP AND TOTAL COUNTERS

The following trip and total counters are shown when the DATA/DELETE menu item is selected from the main menu:

Time:

This trip counter shows the time spent harvesting since the last reset.

Hectare (Ha):

This trip counter shows the measured area harvested since the last reset.

Time Σ :

This total counter shows the total time spent harvesting since the last reset

Hectare Σ :

This total counter shows the total are harvested since the last reset

The above counters only measure time & area when machine is harvesting.

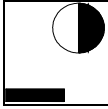
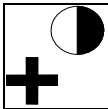
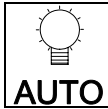
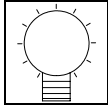
RESETTING THE TRIP AND TOTAL COUNTERS

To reset the trip and total counters simply highlight the counter to be reset and press the C key.

SYSTEM

The system menu is selected from the main menu (press the MENU key). Use the ARROW UP and ARROW DOWN keys to highlight “**System**” and press the ENTER key.

CONTRAST/LIGHT

Key	Description
	Pressing this program key will make the screen lighter.
	Pressing this program key will make the screen darker.
	Pressing this program key will activate the auto-light function. The backlight is switched off until a key is pressed, the backlight will be switched on automatically.
	The display's backlight is turned on and off with this program key.

LANGUAGE

The operating language of the LH 500 Combine monitor is selected here.

TEST

TEST INPUT

Test input can be used if a sensor is suspected defect

Directly under each input description, to the right, is a counter that registers the number of time the input has been activated (the counter is reset automatically each time “**Test input**” is exited or by pressing the C key). On the left-hand side the actual status of the input is shown (**Hi/Lo**).

All of the different inputs can be seen by pressing the ARROW UP and ARROW DOWN keys to page through the 6 screens.

The different input descriptions relate to the following:

Input	Description
Thresher	RPM signal from the thresher speed sensor.
Grain elevator	RPM signal from the grain elevator speed sensor.
Return elevator 1	RPM signal from the return elevator 1 speed sensor.
Press the ARROW DOWN key to see the next inputs:	
Straw walker	RPM signal from the straw walker speed sensor.
Feed auger	RPM signal from the feed auger speed sensor.
Reel	RPM signal from the reel speed sensor.
Press the ARROW DOWN key to see the next inputs:	
Feed auger status	Signal from the feed auger status sensor.
Chopper status	Signal from the chopper status sensor
Fan speed	RPM signal from the fan speed sensor.
Press the ARROW DOWN key to see the next inputs:	
Chopper	RPM signal from the chopper speed sensor.
Sieve loss	Signal from the sieve grain loss sensor.
Walker loss	Signals from the straw walker grain loss sensors.
Press the ARROW DOWN key to see the next inputs:	
Return material	Signal from the return materials sensor.
Forward speed	Signal from the forward speed sensor.
Auto/man reel speed	Signal from the auto/man reel speed sensor.
Press the ARROW DOWN key to see the next inputs:	
Straw compartment	Signal from the straw compartment sensor.
Return elevator 2	RPM signal from the return elevator 2 speed sensor.
Header height	Current from the header height sensor.
Press the ARROW DOWN key to see the next inputs:	
Grain tank full	Signal from the full grain tank sensor.

TEST OUTPUT

Each individual output can be tested. Press the program key number for the following test:

Output	Description
1. Reel Speed +	N/A
2. Reel Speed -	N/A
3. Tank full	The output used to activate an external grain tank full indicator (if fitted).
4. External alarm	The output used to activate an external siren when an alarm is given (if fitted).

SERVICE MENU

The items in this menu are for service use only and are therefore not described in this operators manual.

