

- CEMOS AUTO SEPARATION
- CEMOS AUTO CLEANING
- CRUISE PILOT

Brief instructions CRUISE PILOT / CEMOS AUTOMATIC

June 2014

CLAAS ACADEMY

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CEBIS MOBILE

- CEMOS
- CEMOS AUTOMATIC








CEBIS

- CRUISE PILOT
- Combine adjustment



NOTE: These Brief instructions will not substitute the Operator's Manual!
Further information concerning CRUISE PILOT is available in the Operator's Manual on page 491 – 506 and in the CEBIS MOBILE Operator's Manual.



Menu	Sub-menu	Description
		<p>Calls up the CRUISE PILOT menu and displays the settings.</p> <ul style="list-style-type: none"> • CRUISE PILOT status: OFF or ON • Controller strategy: off / Cruise control / Performance / Throughput • Target ground speed: km/h • Target throughput (material quantity in feed rake conveyor) • Maximum ground speed (km/h) for CRUISE PILOT with the two "Performance" and "Throughput" strategies. • Driving strategy: smooth / normal (default setting) / medium / aggressive / very aggressive
		<p>Sets the master switch (CRUISE PILOT strategy):</p> <ul style="list-style-type: none"> • Off • Cruise control (constant ground speed) • Performance (constant throughput) • Throughput (throughput with control)
		<p>Sets the target ground speed: 2 to 16 km/h</p> <p>Driving the CRUISE PILOT with cruise control strategy.</p>
		<p>Sets the target throughput: 10 to 150</p> <p>Driving the CRUISE PILOT with the performance or throughput strategies.</p>
		<p>Learns the throughput zero point:</p> <p>Follow the CEBIS instructions.</p>
		<p>Sets the max. ground speed: 2 to 16 km/h</p> <p>Driving the CRUISE PILOT with the performance or throughput strategies.</p>
		<p>Sets the driving strategy: CRUISE PILOT reacts as set in the settings.</p> <ul style="list-style-type: none"> • -2 = soft • -1 = normal (standard setting) • 0 = medium • +1 = aggressive • +2 = very aggressive

Strategy

- Cruise control (constant speed)
- Output (constant throughput)
- ✓ Throughput (monitored throughput)

Recommended strategy!

Cruise control

- The machine drives at constant ground speed, regardless of throughput and load. (constant ground speed in km/h)



Performance

- *The machine drives at an adapted ground speed, depending on the determined throughput in the feed rake conveyor. The material quantity fed into the machine remains the same.*



Throughput (recommended)

- *The machine drives with a throughput adapted to the losses occurring in the sieves and the residual separation stage. When the losses rise, the throughput is reduced.*



Selected strategy



Pre-set value for throughput selected by the driver

Current throughput

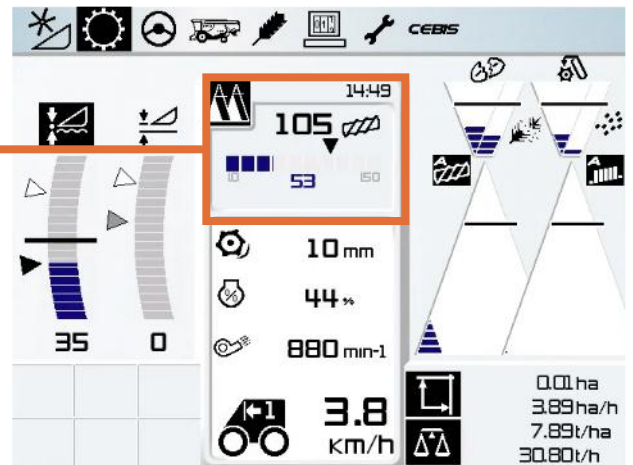
	Limiting element	Description
	Throughput	The pre-set max. throughput is reached, as measured by the sensor in the feed rake conveyor. Learn the zero point at regular intervals.
	Engine load	The maximum diesel engine load is reached in the performance or throughput strategy.
	Engine protection	In case of speed drop due to sudden extreme loads, the ground speed is heavily reduced.
	Maximum set ground speed	The maximum set ground speed is reached in the performance or throughput strategy.
	Separation losses	The separation loss (walker or rotor) limit is reached .
	Cleaning losses	The sieves loss limit is reached .
	Returns volume	The returns volume limit is reached.
	Unloading mode	<p>The ground speed is reduced by 7% to 15% and kept constant upon activating grain tank unloading. Pressing the AUTO PILOT key again deactivates this mode.</p> <p>After deactivating grain tank unloading, there are two options to change back to the initial strategy:</p> <ol style="list-style-type: none"> 1. Automatically upon swinging in the grain tank unloading tube 2. Automatically, 30 s after deactivating the unloading mode, with the unloading tube still swung out
	Turning mode	Upon leaving the working position or when no material can be measured in the feed rake conveyor, the combine-harvester continues travelling at constant ground speed

CRUISE PILOT

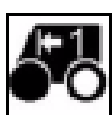
Activation



Pressing 2 s max.: Activation of CRUISE PILOT
Pressing 3 s min.: Learning the throughput



Direction of travel with CRUISE PILOT deactivated.



Direction of travel with CRUISE PILOT activated.

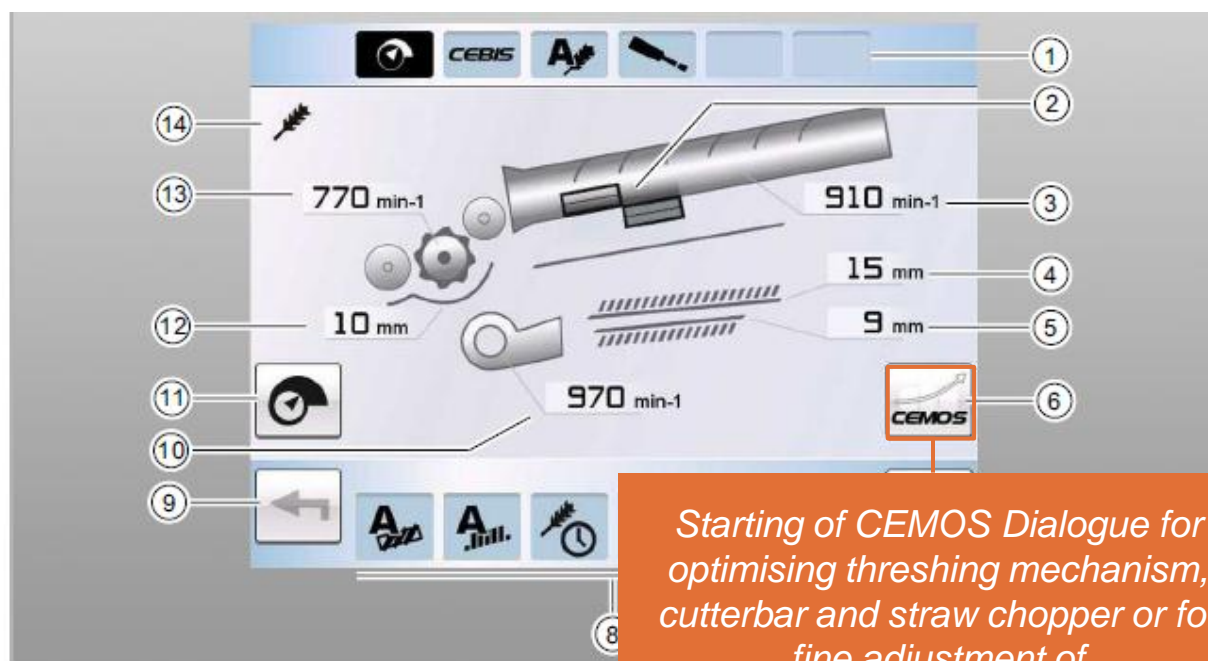
Step by step

1. Engage the threshing mechanism and the front attachment, set the upper idle speed.
Hint: Learn the upper idle speed from time to time so that the engine load indicator works optimally.
2. Switch on CRUISE PILOT in the CEBIS main menu if required
(when starting the machine, the last position (On/Off) is retained).
3. Set the desired strategy in the CEBIS main menu
(recommended: throughput with losses) .
4. Learn the throughput zero point if required (layer height in the feed rake conveyor)
(repeat from time to time).
5. Adjust the upper speed limit in the CEBIS main menu
(prevents that the combine-harvester becomes too fast when crop is missing).
6. Drive the machine into the crop and set it to the output limit of engine or feed rake conveyor layer height (at this time, the losses must be neglected) and press the AUTO PILOT key for 3 seconds min. The CRUISE PILOT accepts the current layer height as the set throughput. Fine adjustments can be made with the HOTKEY if necessary.

Hint: Repeat the procedure at 6. from time to time if crop conditions change heavily. This improves system performance. In this process, drive the machine at the output limit manually for 15 seconds min. and only then press the AUTO PILOT key for 3 seconds.

Note: In initial operation, when changing the crop or when the CRUISE PILOT was disengaged for more than 5 hours with the threshing mechanism engaged, an automatic learning process starts upon activation by the AUTO PILOT key in order to establish the condition of the crop. This takes at least 2 minutes. During the learning process, the CRUISE PILOT will not react properly to different harvesting conditions.











7. When using the “Throughput with losses“ strategy, set the loss sensors to the desired loss level. The loss triangles should be filled about halfway in this process. Repeat this process if necessary.
8. At the end of the track, the CRUISE PILOT can be deactivated by noticeably moving the ground speed control lever or by pressing the foot brake. As an alternative, the machine can be turned in the turning area mode.
9. At the beginning of a new track, briefly press the AUTO PILOT key (2 s max.) if the CRUISE PILOT was deactivated upon leaving the old track.



Starting of CEMOS Dialogue for optimising threshing mechanism, cutterbar and straw chopper or for fine adjustment of CEMOS AUTOMATIC

Applies to: CEMOS from version 1.08.x

	Designation	Function
1	Main menu bar	Displays all available main menus. Shows the active main menu with a black background.
2	Position of rotor cover plates	
3	Rotor speed	
4	Upper sieve width	
5	Lower sieve width	
6	Start optimisation menu	
7	Help	Calls up a help text or a picture (if available) relating to the current menu item.
8	Status indicator	Displays the status of the installed automatic functions*. Page 13
9	Back	Exits the menu or the function without any changes.
10	Fan speed	
11	Harvesting conditions and machine equipment menu	Resets machine equipment, front attachment equipment and harvesting conditions. Sets the automatic functions*.
12	Threshing concave width	
13	Threshing drum speed	
14	Crop	Displays the selected crop as text.

	Description	Function
	CEMOS AUTO SEPARATION* OFF	Displays the status of the automatic function.
	CEMOS AUTO SEPARATION* ON	Displays the status of the automatic function.
	CEMOS AUTO SEPARATION* active	Displays the status of the automatic function.
	CEMOS AUTO CLEANING* OFF	Displays the status of the automatic function.
	CEMOS AUTO CLEANING* ON	Displays the status of the automatic function.
	CEMOS AUTO CLEANING* active	Displays the status of the automatic function.
	Maximum throughput*	Displays the selected optimisation strategy.
	Minimum fuel use*	Displays the selected optimisation strategy.
	High threshing quality*	Displays the selected optimisation strategy.
	Balanced*	Displays the selected optimisation strategy.

CEMOS AUTOMATIC

Automatic modes, Harvesting conditions, Machine equipment CLAAS ACADEMY



Note: Call up the Automatic modes, Harvesting conditions and Machine equipment chapters before starting and report any changes (e.g. straw moisture) immediately during the harvesting day

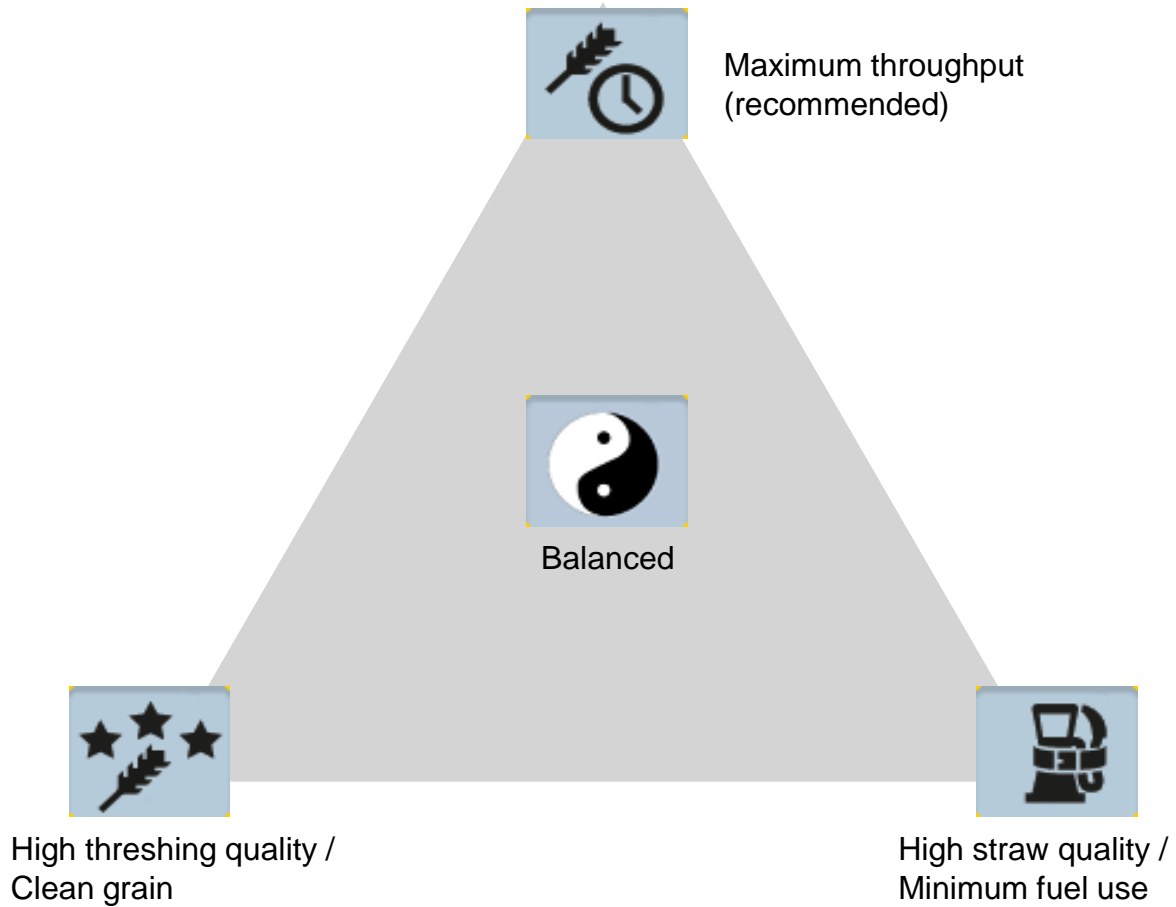
*Automatic modes: Which automatic modes are to be used?
(recommended: all)*

*Which strategy is to be selected?
(recommended: maximum throughput)*

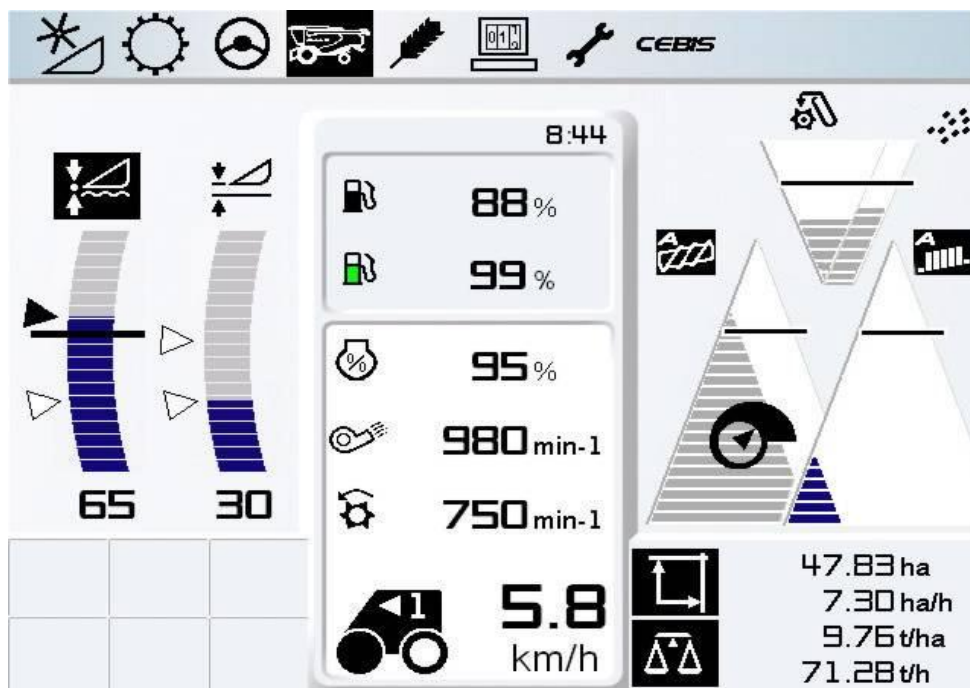
*Harvesting conditions: What is the straw moisture?
(important influence on selected rotor speed, update continuously)*

*What are the current crop conditions?
(bent, standing, down or weed-infested)*

Machine equipment: The machine settings that cannot be detected by sensors are covered here (e.g. the type of sieves)



Should the result not be satisfactory with the selected strategy, this can be reported to CEMOS AUTOMATIC through CEMOS Dialogue. The system will continue optimising in the desired direction and change the strategy if required. Bear in mind that e.g. further improvement of cleanness will have a negative effect on throughput.



The CEMOS AUTO SEPARATION automatic function permanently adapts the rotor speed and the rotor cover plates to the current harvesting conditions, thus minimising the grain losses of the separation and cleaning stages.

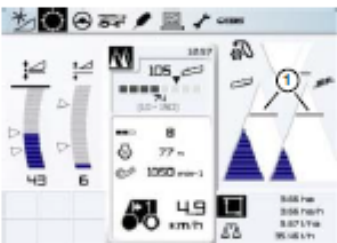
The CEMOS AUTO CLEANING automatic function permanently adapts the upper sieve width, the lower sieve width and the fan speed to the current harvesting conditions, thus minimising cleaning losses and maximising cleanness (threshing quality). To achieve optimum cleaning results at all times, the cleaning settings are corrected when the longitudinal angle varies (on slopes).

The automatic function covers certain learning points at intervals of between 4 and 40 minutes in order to determine the machine behaviour under the current harvesting conditions. The learning phases usually do not take longer than 20 seconds and are displayed by a symbol in the CEBIS loss display.


During the learning phases of the CEMOS automatic functions, the loss or returns displays in the CEBIS harvest display are temporarily displayed in grey. CEMOS AUTO SEPARATION learning phase: Symbol appears above the rotor losses. CEMOS AUTO CLEANING learning phase: Symbol appears above the sieve losses.

Note: During the learning phases, the rotor cover plates are opened and closed. Closing the rotor cover plates in the crop is not possible

Settings in CEBIS:

Menu	Function
	Learn yield measuring zero point.
	Learn returns zero point.
	Learn CRUISE PILOT layer height zero point.
	Learn speeds and learn limit stops of sieves.
	Check the type of crop.
	Switch on the CRUISE PILOT master switch. Select the max. ground speed and strategy.
Calibrate the loss sensors. (Set the desired loss limit on the horizontal line (1).)	

Settings in CEBIS MOBILE:

Menu	Function
	Learn the inclinometers (2).
	Enter the harvesting conditions (e.g. straw moisture) and update regularly (3).
	Select the desired optimisation strategy. The recommended strategy for starting in CEMOS AUTOMATIC is "Maximum throughput".

Note: Repeat the preparations for initial operation if required if the work of CEMOS AUTOMATIC is not satisfactory despite all efforts made.

Step by step

1. Engage the threshing mechanism and the front attachment, set the upper idle speed.
Note: CEMOS AUTOMATIC with the CEMOS AUTO SEPARATION and AUTO CLEANING sub-systems is activated every time after starting the machine.
2. Set the respective crop (e.g. wheat) in CEBIS.

Note: When needed, adapt the suggested values manually directly before starting the harvest in order to accelerate the work of CEMOS AUTOMATIC. Own values can also be loaded as long as these are assigned to the respective crop.
3. Answer the Harvesting conditions, Machine equipment and Automatic modes menu items and the desired strategy for CEMOS AUTOMATIC in CEBIS MOBILE (see page 10).
4. Activate CRUISE PILOT in CEBIS and select the Throughput with losses strategy, set the upper speed limit when needed (see page 7).
5. Drive the machine into the crop and activate all Automatic modes by pressing the AUTO PILOT key (steering, CRUISE PILOT, CEMOS AUTOMATIC).

Note: CEMOS AUTOMATIC starts optimising the rotor and the cleaning system right away, but it takes some time until the optimum is reached.
6. CRUISE PILOT: Set the set throughput by pressing the AUTO PILOT key for 3 seconds.
7. If necessary, adapt the sensitivity of loss sensors for separation and cleaning (set the desired loss limit just below the horizontal line).
8. Returns volume limit: Learn the zero point and adapt the limit if required (CEMOS AUTOMATIC controls up to the line which can be relocated when needed. The standard value is 70%. When the returns is too full, lower the limit).
9. Adapt the GRAINMETER sensitivity in the CEBIS main menu if required (the display should match the visible grains portion in the returns window).
10. Set the threshing mechanism optimally, using CEMOS Dialogue (see page 8).
11. Start CEMOS Dialogue if the work result is not satisfactory.

Note: The work of rotor and cleaning system can be optimised here. It is true that these areas are controlled by CEMOS AUTOMATIC, but the driver's feedback about the work result is taken into account in the calculation. This is why optimisation should first be achieved through CEMOS Dialogue (a change of strategy is suggested when needed).
12. Adapt items 3, 4, 6-10 at regular intervals as needed during the day. Above all, the straw moisture condition should be permanently updated during the day.

