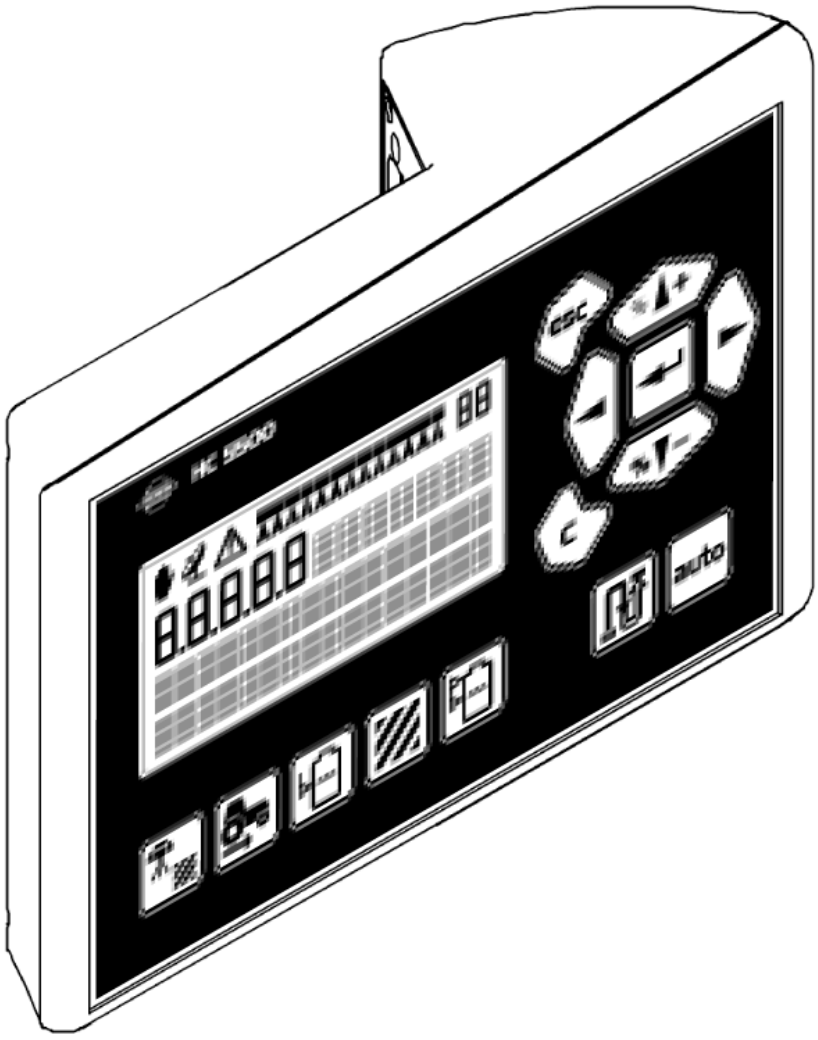
CONTROLLER
HC5500

Software Manual – SW 4.XX

GB – 12.2008



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Software

The software in the HC5500 and JobCom can be upgraded. Examples for this are improvements for better performance and bug fixes.

When the software for the controller is changed, it will be available from Hardi's Technical Service department. The software can be sent as an attached Zipped file on the E-mail.

Uploading new software to the controller will normally not have any visible effects and will delete the settings / memory of the controller.

A master reset can delete the settings and memory in the controller. After a master reset all settings in the controller must be set again, perform always a master reset after a software update.

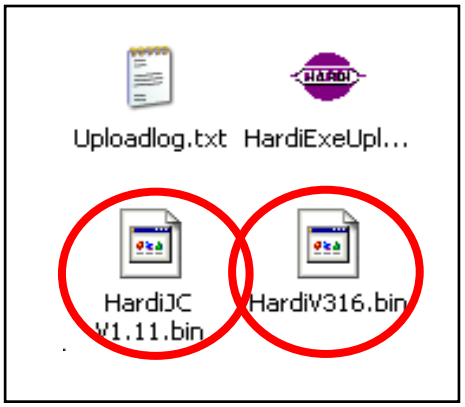
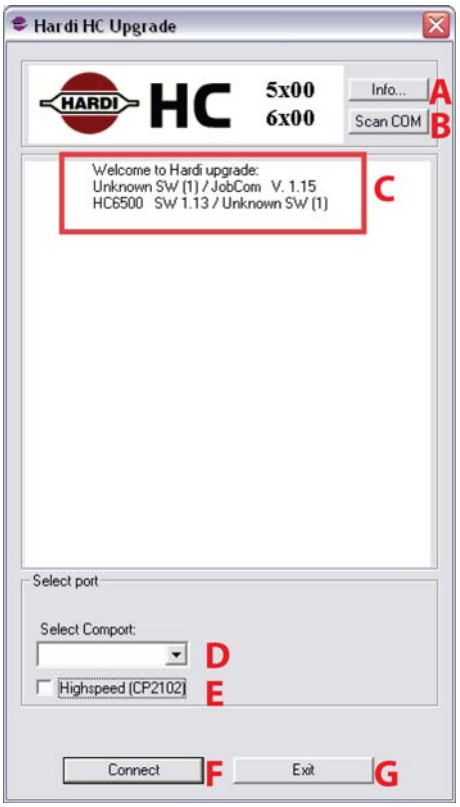
To prevent too manually setup of all parameters in the HC5500 after a software update or master reset is it possible to save the configuration to a computer and transfer it again to the controller after the update or reset.
For software versions higher than 4.01 can all parameters be saved in a configuration file on a PC.
To save the parameters from the JobCom it should be enabled in menu E.9.1 prior to a configuration dump.
If the JobCom is enabled and defect, the HC5500 will give the error message "Incomplete".
The HC5500 parameters, without the JobCom parameters, will be saved in the configuration file and can be transferred to the HC5500 and a new JobCom.

See the chapter "Handling the Configuration file" how to save and send the configuration file to the controller and JobCom.

HC5500 software versions lower or equal to 4.00 will not save all parameters from the HC5500 and JobCom. Following parameters will not be saved and should be setup manually:

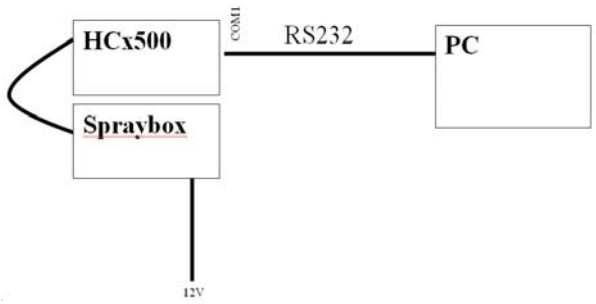
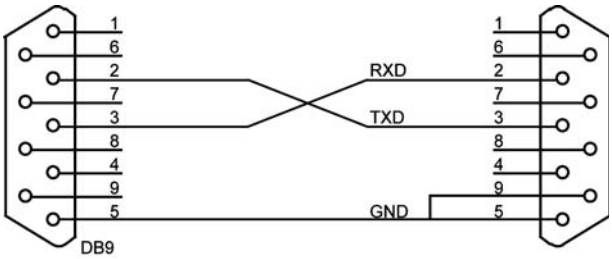
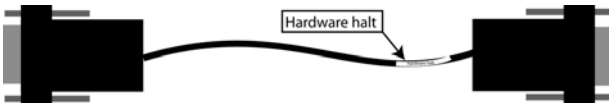
Menu		**Parameter**	**Menu**		**Parameter**
E8.1.7.1	Pressure	Active/Passive	E9.6.1	Fan speed	Fwd, Rev.
E8.4.1	Enable	Yes/No	E9.6.2	Air angle	Fwd, Rev.
E8.4.2.2.3	----->	Right extreme			
E8.4.2.2.4	<----	Left extreme	3.6.1	Track width	
E8.4.3	Chassis	CM05, Small, Med, Large, NAV 07 M	3.6.2	Tractor drawbar	
E8.4.4	Sprayer drawbar	0-200cm	3.6.3	Dead zone	
E8.4.5	Manual angling	Default is 0	3.6.4	Damping	
E8.4.6	Boom sensors	0, 1, 2	3.6.5	Alignment offset	
E8.4.8	Minimum radius	Default: 6m	3.6.6	Sensitivity	
E8.4.9	Half steer	No/Yes	3.7	Look Ahead	All menu 3.7.1 to 3.7.x
E8.4.10	Safety factor	Default 100%			

Software program for the controller

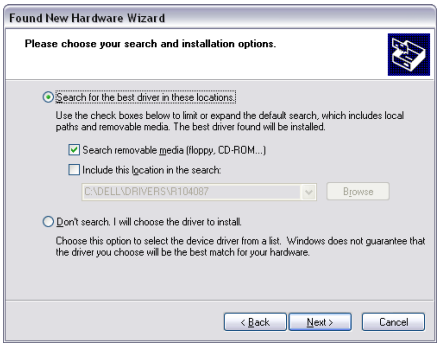
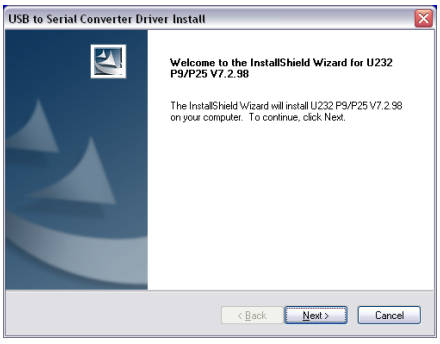
The software sent in a mail as Zip file. The Zip file must be unpacked and put into a folder.	
The top file (HardiExeUploadWinvxxx.exe) is the upgrade program. The two other files (xxx.bin) are the software for the controller and the JobCom. This example show HC5500 software file “HardiV316.bin” with software version is 3.16. The JobCom reads “HardiJCV1.11.bin” with software version 1.11. Note: It is very important that these three files are in the same folder at all time otherwise will the upgrade program not work.	
Run Hardi HC Upgrade, double click on HardiExeUploadWin.exe and you will get a window like this: How to use the Hardi upgrade program is described in section “Software upload HC5500” and “Software upload JobCom”. **A:** Information about the current version of Hardi HC Upgrade. **B:** Here you do a complete serial port scan **C:** Shows the software available for upgrade. **D:** Here you select the comport, which is connected to the unit you use. **E:** Check this button if you wish to use high-speed transfer, this is only possible with a “CP210x USB to UART Bridge Controller” and only together with HC6500. **F:** Connect and upgrade unit. **G:** Exit program.	

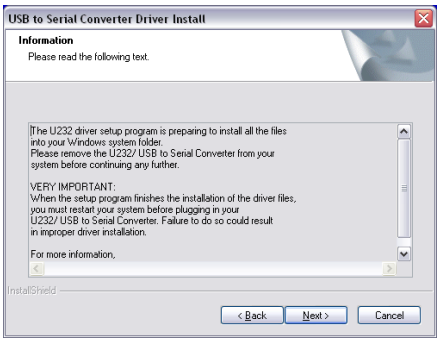
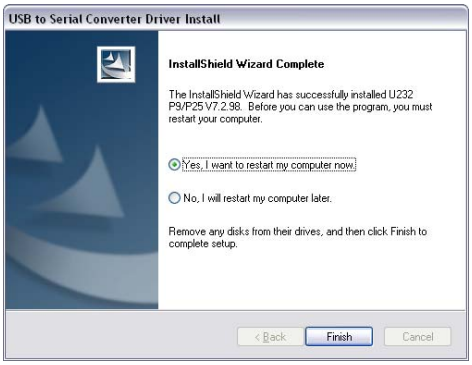
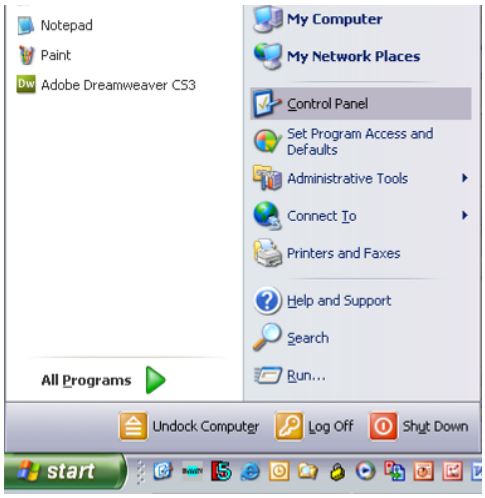
The “Info” button shows the version information of the Hardi PC Uploader and software in the connected controllers.	

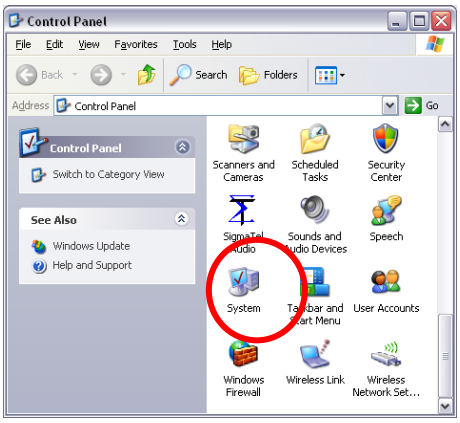
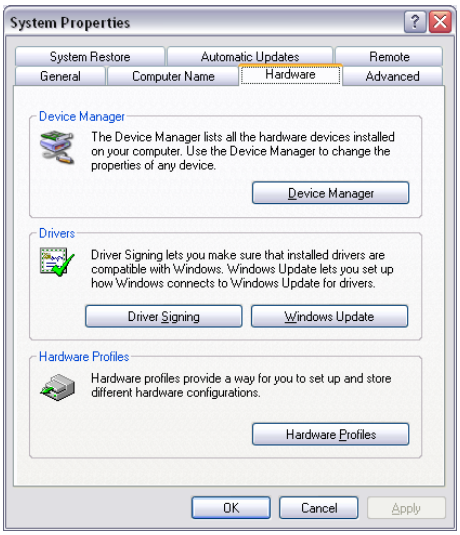
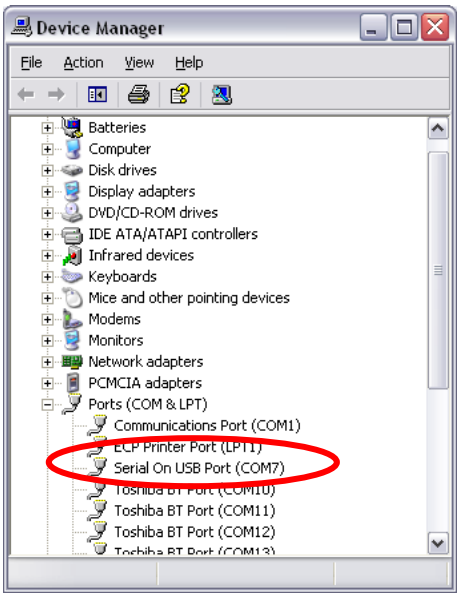
Communication cable

The connection from the PC to the controller is made with HARDI cable P/N 72271600. The cable has a short circuit in one of the connector, normally where the label is. For software update this means HC5500	
Loop in communication cable. Port 1 (Com 1) is used as communication port on the HC5500.	
The cable is marked with “Hardware halt” at the end with the loop. The mark is on the cable or with a yellow sticker on the connector. If the cable is turned the wrong way, the software transfer procedure may not be possible. The communication cable is shown on the spare part CD, pages M302. Part number for the cable is 72271600 and can be ordered as a normal spare part.	

USB to RS232 Converter

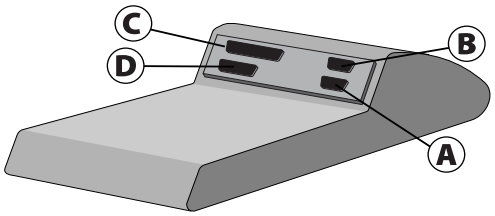
If there is no RS232 port, or problems with the Com port on the computer, use a converter from USB to RS232. The systems requirement to use a converter is: A computer with Windows XP or later. USB to RS232 serial converter, Hardi P/N 26025900. Serial NULL-modem cable, or Hardi "Communication cable" P/N 72271600.	
Install the USB to RS232 serial converter using the instructions and driver, which should be included with the USB to RS232 serial converter. NOTE: Do not plug the USB-RS232 converter into the system before the driver is finished installing	
Insert the CD-Rom with the driver in the drive. Select "Search for the best driver in these locations" and "Search removable media floppy, CD-ROM" and select Next>	
At this screen select "Next>"	

Accept the “Information” window by pushing the “Next>” button	
Select if you want to restart the computer now or later. Push the “Finish” button. After a restart of the computer the adaptor is ready to use.	
Verify comport number. Before you can start upgrading your Hardi controller, you need to find the number of the USB-serial Converter. Click on the Windows “start” button and select “Control panel”.	

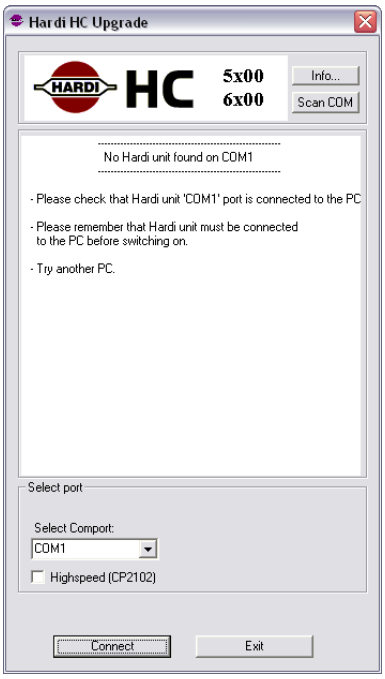
Double-click on the “System” icon.	
Click on the “Hardware” tab. Click on the “Device manager” button	
Find and expand the “Ports” icon by clicking on the ‘+’ left to the icon. Now you will see a screen not so different from the picture above. Here you see that there are many devices using a COM number, This may varies from PC to PC. COM7, the one we need is called “Serial On USB Port (COM7). With that number in mind you can close the Device Manager window, and continue to next step. The number connected to the “Serial On USB Port” is in this case 7. But keep in mind, that this is just a guide, you need to see your self, what number your “Serial On USB Port has been installed on.	

Software upload HC5500

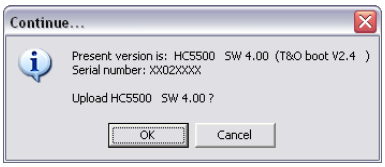
The HC5500 software version is shown every time the controller is switched on.

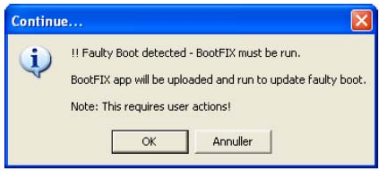
The communication cable without the “Hardware halt” is plugged into the PC. This is done before the computer is powered up. The communication cable with the “Hardware Halt” is attached to the HC5500 in COM 1 (A) port).	
Power ON the PC. Power ON the HC5500 When the HC5500 is ON, the display will write “Hardware halt”. The controller awaits contact to the Hardi HC5500 upgrade software programme.	
On the PC, the upgrading program can be started up and the PC dialogue box should look like this. The dialogue box shows what software version will be uploaded to the HC5500 Controller. Communication port has to be chosen. If the Com port not is shown, select Scan COM and see section “USB to RS232 Converter” how to find the Com port number to use. High-speed (CP2102) can only be used with the HC6500 Controller.	

The upgrading program will tell what kind of error there is with the connection and what can be done to solve the problem.

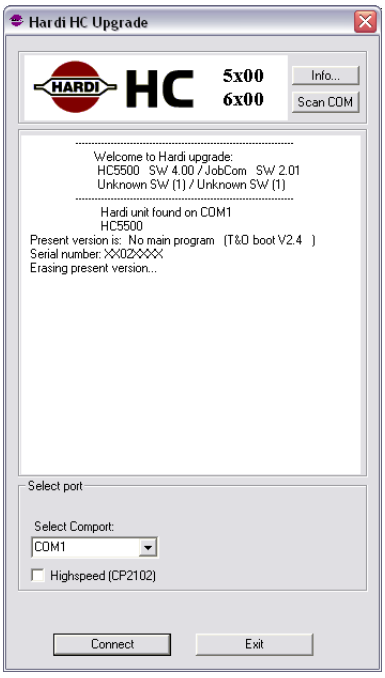


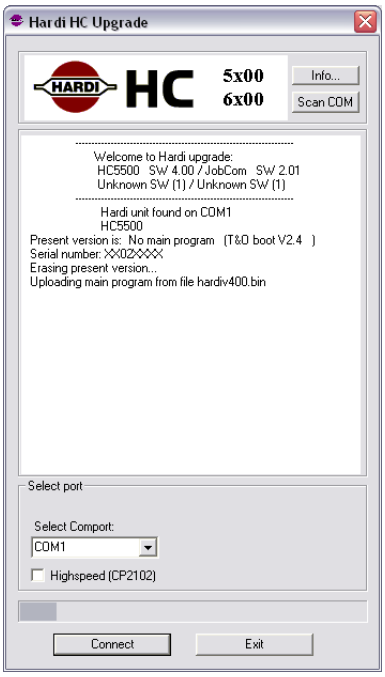
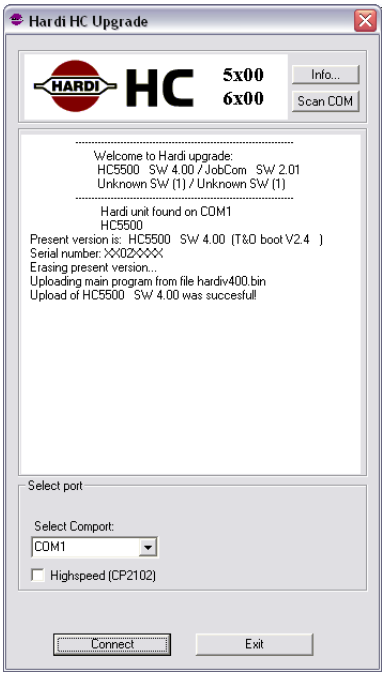
The dialogue box will ask if the software should be uploaded to the selected version.
Select “OK”.
The display in the HC5500 will change.
If the display does not change, something is wrong with the connection.
There are three versions of this window:
One where you have to upload a new application
One where you have to upload a new boot and a new application.
The third version is only seen on the HC5500 with boot software older than v2.4. This version of the boot software contains a problem that requires a special update sequence to be executed.





The only difference between the two first versions is the “Upload new boot…” line. This is because it isn’t always necessary to upload a new boot, to upload new application software.
- Click “OK” to upgrade HC5500.
- If HC5500 needs to upgrade boot software it will erase the old one, and the “Hardi HC Upgrade” will upload a new version.
- Afterwards “Hardi HC Upgrade” will erase the current application on HC5500 and upload the new one.

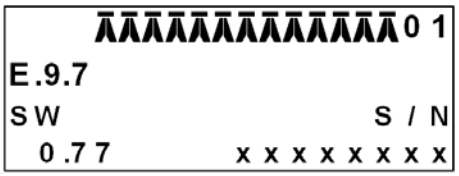
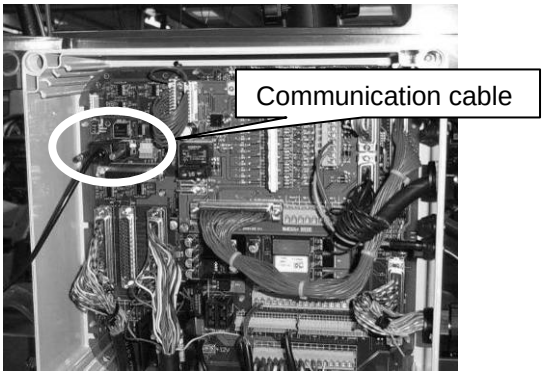
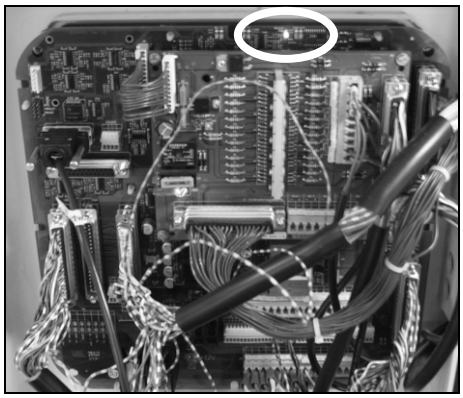
Click “OK” to start the bootFIX upgrade. - The “Hardi HC Upgrade’’ will erase the current application and upload the bootFIX application - When upload of the bootFIX application is done, the following window popup.	
Important: **Follow the instructions point by point.** - Click “OK’’ to confirm user actions. - The “Hardi HC Upgrade’’ will erase the current boot software through the bootFIX application and upload the new boot software version. - When the boot software upload is done, the “Hardi HC Upgrade’’ software will ask if you wish to upload the application software to replace the temporary bootFIX software. - Click “OK’’ to do normal application update.	
The display in the HC5500 will change. If the display does not change, something is wrong with the connection.	
Is there no problem with the connection between HC5500 and the PC, the uploading will start. The upgrading program writes what it is doing. The upgrade program starts to erase the software in the HC5500.	

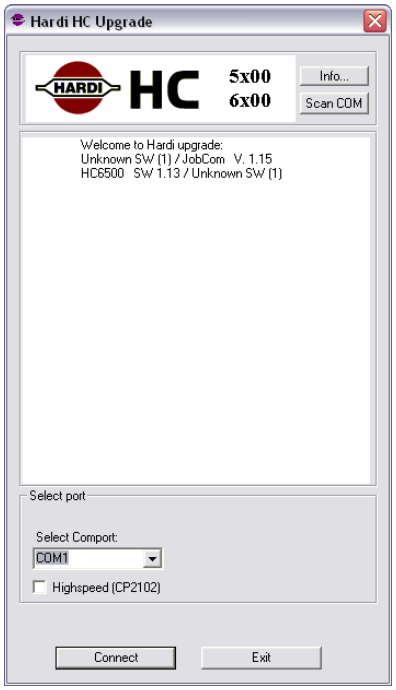
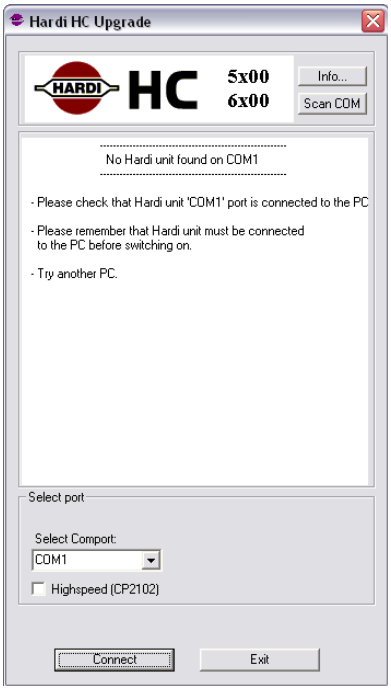
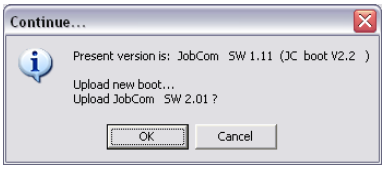
Then the uploading of the new software start. The bar at the bottom of the dialogue box indicates the upload process. When finished, the program informs if it has been successful or not.	
The dialogue box displayed when uploading is finish.	

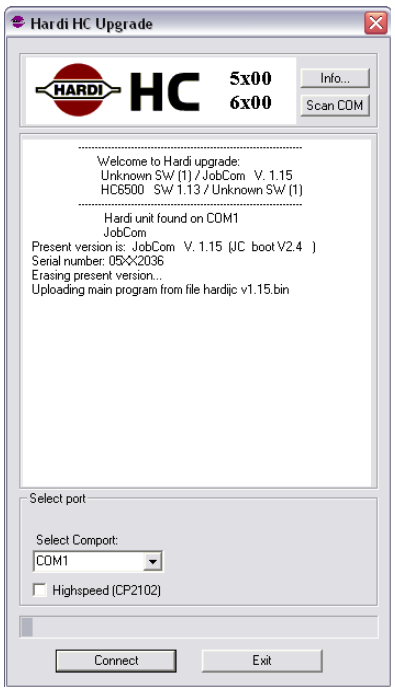
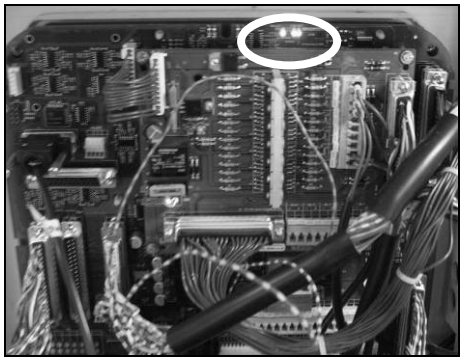
Master Reset HC5500 To access Extended Menu, press and hold ESC button on HC 5500 and then power ON the controller. A “bip” will indicate Extended Menu is active and it will show E1. With new software in the HC5500, it is necessary to perform a reset. The reset is done in E7.2. The PIN code is 12345. When keyed, press “Enter” and resetting will begin. When done, press “ESC” to exit the menu. After reset, the HC5500 return to default values. Only the total register “0” will not be reset.	

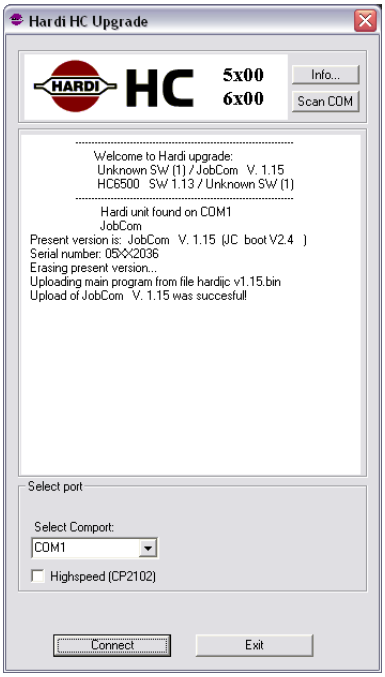
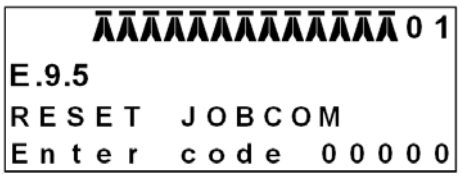
Software upload JobCom

The connection from the PC to the JobCom is made with HARDI cable P/N 72271600. The cable has a short circuit in one of the connector, a “Hardware halt”, normally where the label is. This connector should be connected to the device that is receiving data, in this case the JobCom. The PC needs the software program Hardi upgrade.

The JobCom software version can be seen in Extended Menu E9.7. This menu will show what software version and what serial number the JobCom has.	
The communication cable is plugged into the PC, the plug without the “Hardware halt” (yellow sticker) – this is done before the computer is started up.	
The communication cable is plugged into the JobCom before it is switched on. The plug that is attached to the JobCom is the one with the “Hardware halt” (yellow sticker).	
When the JobCom and PC is connected the PC can be powered up and afterwards the JobCom. The JobCom is powered up on Spray box. To be sure that JobCom is ready to be upgraded, ensure that the red LED flashes 5 times and then pause in a loop. Here you notice the green circle which surrounds the red LED on the JobCom. The JobCom knows that it will receive software as soon as the communication cable is attached and therefore has it started up being ready for receiving data. The red LED can be seen, in the top of the picture, the watchdog is marked.	

On the PC, the upgrading program can be started up and the PC dialogue box should look like this. The dialogue box shows what software version will be uploaded to the JobCom. Communication port has to be chosen. If you use a USB-Serial converter see section “USB to RS232 Converter” how to find the Com port number. Select “Connect”. High-speed (CP2102) can only be used to the HC6500 Controller.	
If the upgrade program does not find a connection between the JobCom and PC, this error message will appear. If this message appears, then see if the cable is attached correctly and there is power on the controller. If this does not help, power down the PC and the controller and start all over.	
When you press “Connect” the upgrade begins, after a little while, you will be prompted with a window. There are two versions of this window, one where you have to upload a new boot and a new application. This looks like the window to the right:	

The only difference between the two versions is the “Upload new boot…” line. This is because it isn’t always necessary to upload a new boot, to upload new application software. - Click “OK” to upgrade JobCom. - If JobCom needs to upgrade boot software it will erase the old one, and the “Hardi HC Upgrade” will upload a new version. - If it was necessary to upgrade the boot software (if not, skip this step), you will be prompted with the following window after the boot upload:	
- Turn off and on the power on JobCom and wait until JobCom red LED continues to flash 5 times and then pause in a loop. Then click “OK” to continue upgrading JobCom. - Afterwards “Hardi HC Upgrade” will erase the current application on JobCom and upload the new one. The bottom bar of the display dialogue box indicates how far the uploading has processed.	
When the upload of the new software has started, diode N28 and D27 will start to flash together with the watchdog.	

- At last “Hardi HC Upgrade” will prompt: “Upload of JobCom SW X.XX was successful!” and you are done. If the updating was not successful, try again. Check the power supply to sprayer and PC.	
Enable JobCom in menu E.9.1. Reset JobCom with HC5500. With new software in the JobCom, it is necessary to perform a reset. To reset JobCom with a HC5500 enter menu E.9.5. The PIN code is 74650.	

Software error codes

Controller error codes
Error codes can be a combination of the below:
E.g. Code 6040: This is a combination of code 6000 and code 40 where 6000 means it could not write to the serial port and 40 means a reply is missing.

Codes indicating the uploader program have gone into a non-existence mode:
555
666
777
888
999

Codes for Send Data () errors:
1000 Serial port is not open
2000 Could not write to serial port (API-call WriteFile() failure)

Codes for GetData() error:
5000 Serial port is not open
6000 Could not write to serial port (API-call WriteFile() failure)
7000 Number of bytes read from serial port was less than expected
8000 Checksum fault in the received data

Codes for UploadMain() error:
3 H8 Flash could not be erased
10 Could not send 'SN' or 'MR' or 'PM' to the controller
20 No answer from controller on 'SN' or 'MR' commando
1..9 Controller answered 'SNx, 'MRx' or 'PMx' where x = 1..9 (0 expected)
30 Reply from controller not recognized (SN0 or MR0 expected)
40 Could not read the reply from 'PM' from the serial port

Codes for SendProgram() errors:
100 Unknown controller type (HC5500 or JobCom)
200 Could not write a data-block to serial port
300 Answer from the controller not recognized as block acknowledge
400 Negative block acknowledge from the controller
500 Could not read block acknowledge from serial port
600 Could not send BLKEND to controller
700 Could not read answer on BLKEND from serial port
800 Controller gave illegal answer on BLKEND

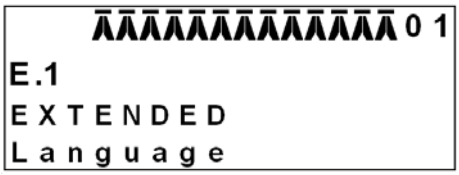
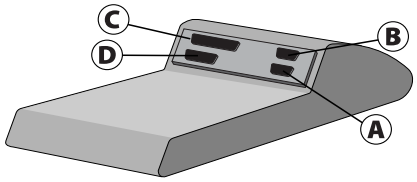
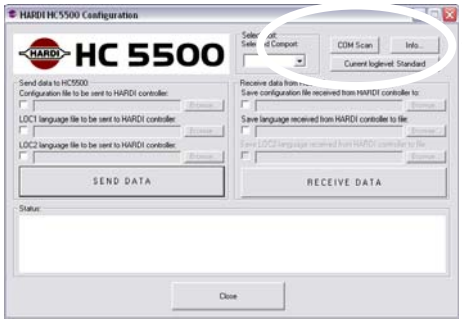
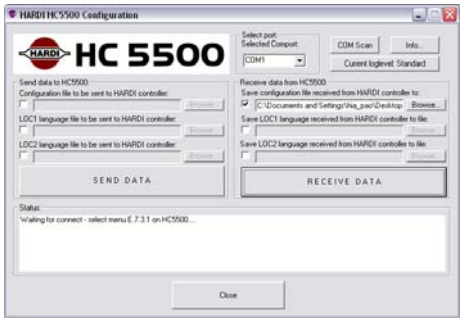
Codes for SendProgramExternalFile() errors:
10000 Program file is too small
20000 Unknown controller type (HC5500 or JobCom)
30000 Could not write data-block to serial port
40000 Could not read block acknowledge from serial port
50000 Answer from the controller not recognized as block acknowledge
60000 Negative block acknowledge from the controller
70000 Could not send BLKEND to controller
80000 Could not read answer on BLKEND from serial port
90000 Controller gave illegal answer on BLKEND

Hardi HC Upgrade software error messages:

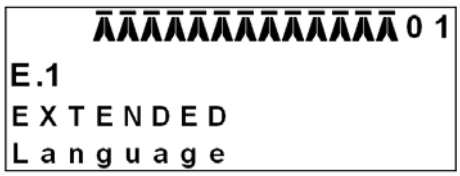
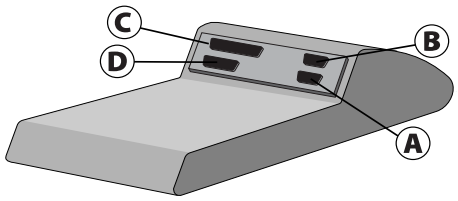
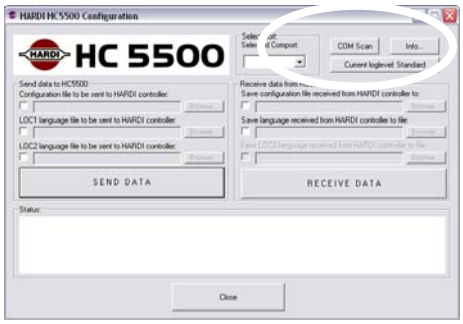
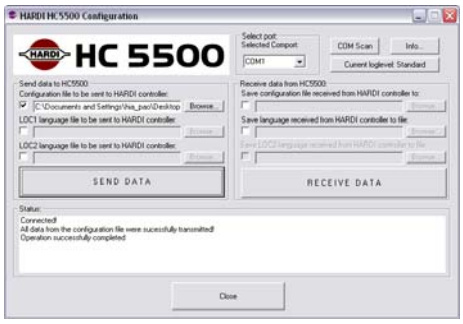
Message	Possible Error	Solution
Please select a Comport	Didn't select a Comport	See section "Software program for the controller"
No Hardi Unit found on ComX (Xbeing the selected comport number).	A: Didn't select correct comport, which is connected to Hardi Unit. B: No power on unit. C: Comport already in use.	A: See section "Software program for the controller" B: Make sure the device power cable is correctly installed. C: Make sure that the comport selected, isn't already in use by another program, in that case, close the other program.
Upload of main program failed, error code (20)	Forgot to turn off the HC5500/JobCom after boot Upload	HC5500: See section "Software upload HC5500". JobCom: See section "Software upload JobCom".
Upload of main program failed, error code (2)	No software to upload found	See section "Software program for the controller".
HW>=2.0 re!	Hardware version 1.1 can not be loaded with software version higher than 3.16	Upload software version 3.16 or exchange the HC5500 to a version2.0

Handling the Configuration file

Save the configuration file to the PC:

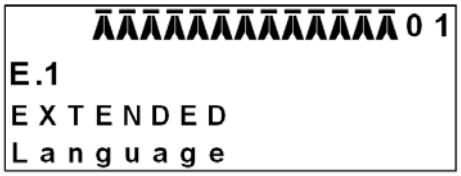
Power ON HC5500 in Extended Menu mode.	
Select E.7.3 Factory Send config	
Select E.7.3.1 Send Config Config only Push the “Enter” button	
Connect RS232 cable to HC5500 COM 1 (A) port. If using the HARDI communication cable P/N 72271600, connect the “Hardware halt” end of the cable to the PC.	
Open HARDI HC5500 Configuration program on the PC. Select COM port for PC. In case of communication problems please activate the extended log level. Push the "Current loglevel" button to toggle between standard and extended log level. In case of trouble, pleas send the extended log file to Hardi service for future investigation.	
Mark the “Save configuration file received from HARDI controller to:” on right hand side. Save the file on the PC Click “Receive data” and follow instructions in the “Status” box. Push the “Enter” button on controller.	

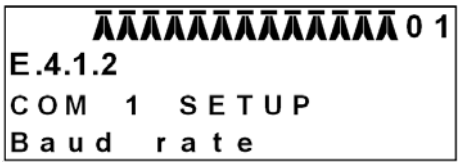
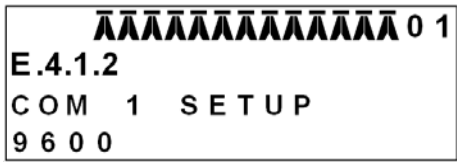
Send the configuration file to the HC5500:

Power ON HC5500 in Extended Menu mode.	
Select E.7.4 Factory Receive conf.	
Select E.7.4.1 Receive conf. Config only Push the “Enter” button	
Connect RS232 cable to HC5500 COM 1 (A) port. If using the HARDI communication cable P/N 72271600, connect the “Hardware halt” end of the cable to the PC.	
Open HARDI HC5500 Configuration program on the PC Select COM port for PC. In case of communication problems please activate the extended log level. Push the "Current loglevel" button to toggle between standard and extended log level. In case of trouble, pleas send the extended log file to Hardi service for future investigation.	
Mark the “Configuration file to be sent to HARDI controller:” on left hand side. Select with the “Browse” button the file to be uploaded to HC5500. Click “Send data” and follow instructions in the “Status” box. Push the “Enter” button on controller.	

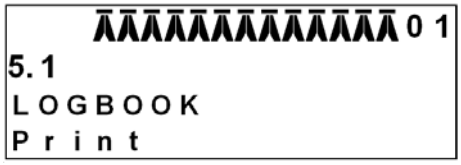
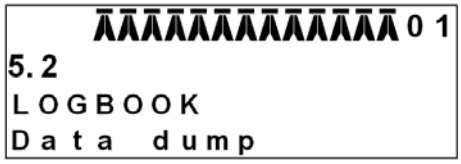
Dump of data from HC5500 Controller

Configuration of HC5500 to dump data

Open the extended menu in the controller by doing following: Switch OFF the Controller Push and hold the “ESC” button on the Controller Switch ON the Controller and release the “ESC” when the E.1 Extended menu is showed.	
Select: E1 Language E2 Unit E3 Sprayer type E4 Data exchange E5 Optional sensors E6 Service interval E7 Factory settings E8 Settings E9 JobCom	
Select: E.4.1 Data exchange COM 1 SETUP COM 2 Setup	
Select: E.4.1.1 Equipment type E.4.1.2 Baud rate E.4.1.3 Protocol select	
Select: E.4.1.1 Equipment type Printer Dump Printer & dump GSM VRA/remote If “Dump” is chosen: Data will be dumped “raw” and the data from printed data in the controller will not be able to be printed out of the controller, like in Menu 5.1. If “Print & Dump” is chosen: Data can be written out “raw” or the data can be written out from the print menu.	

Select: E.4.1.2 Com 1 setup Baud rate 9600	
Select: E.4.1.2 Baud rate 1200 2400 4800 9600 19200	
Leave the extended menu by switching off the controller	

Dump data from HC5500

Switch ON the controller and open the normal menu by pushing the Menu button. Connect the data cable to the PC. The Hardware Halt connector to the PC and the other end to the COM port that is selected in the section "Configuration of HC5500 to dump data".	
Select: 5 MAIN MENU Logbook	
Select 5.1 LOGBOOK Print	
Select one of following options: 5.1.1 Print register number 5.1.2 Print all registers 5.1.3 Print configuration	
Select 5.2 LOGBOOK Data dump	
Select: 5.2.1 Data dump raw data 5.2.2 Data dump with header 5.2.3 Data dump Configuration	

Configuration of HyperTerminal

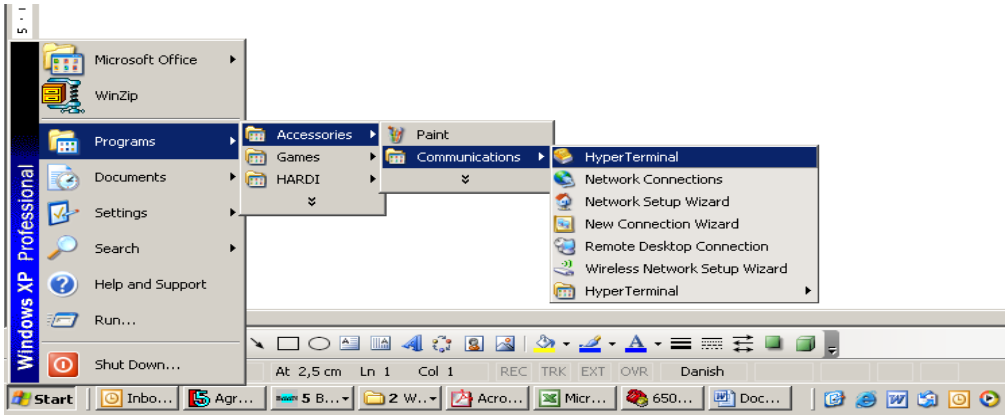
It is possible to transmit and receive data to and from the HC5500/6500 through the com port on the controller and the computer.
Use HyperTerminal on the PC to transmit or receive data from the Controller.
The connection from the PC to the controller is made with HARDI cable P/N 72271600. The cable has a short circuit in one of the connector, normally where the label is. This connector should be connected to the device that is receiving data.
See appendix for drawing of the cable.

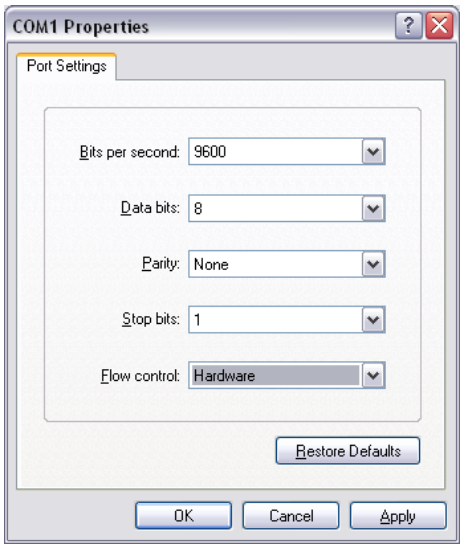
The data read in HyperTerminal can be exported to a spreadsheet or a word processing, see section “Handling the data”.

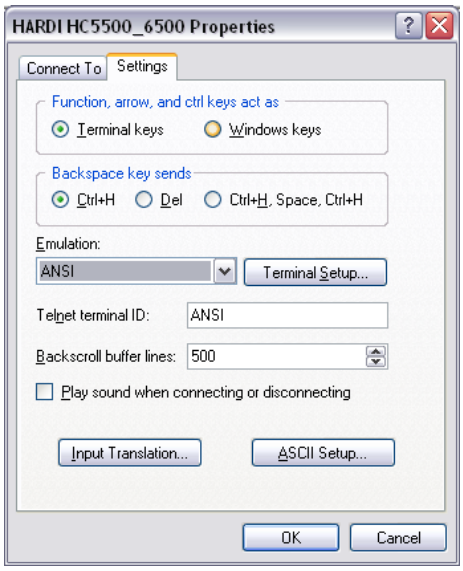
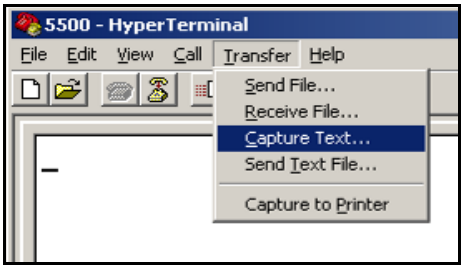
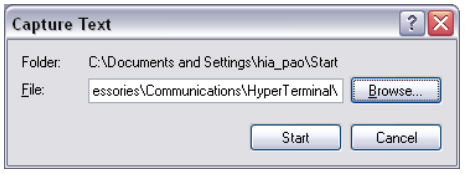
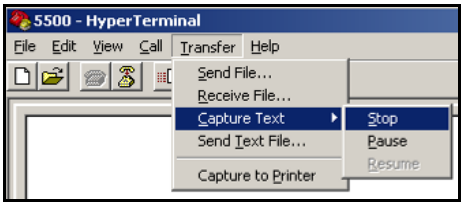
Configuration of the HyperTerminal:

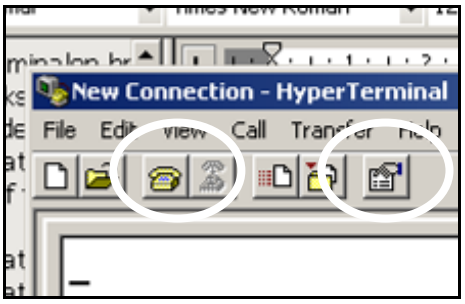
Baud rate	9600
Data bit	8
Parity	None
Stop bit	1
Flow control	Hardware
Emulation	ANSI

The HyperTerminal is normally installed in the “Start” menu in Windows:



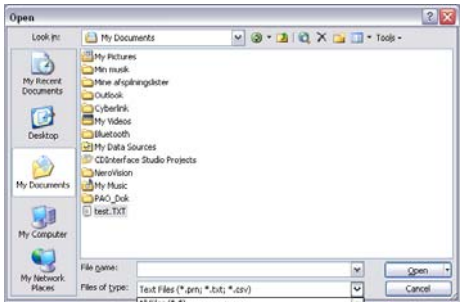
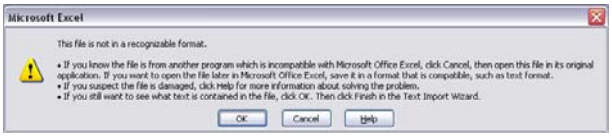
Open HyperTerminal and enter a name	
Select COM1 or another available COM port on the PC	
Add the port setting data and select “Apply” and “OK”.	

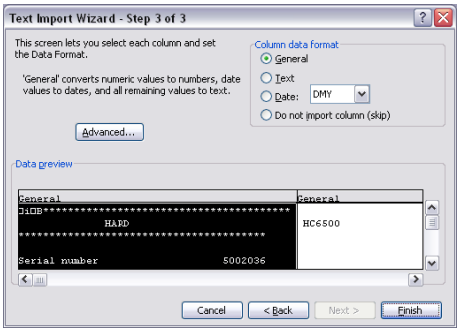
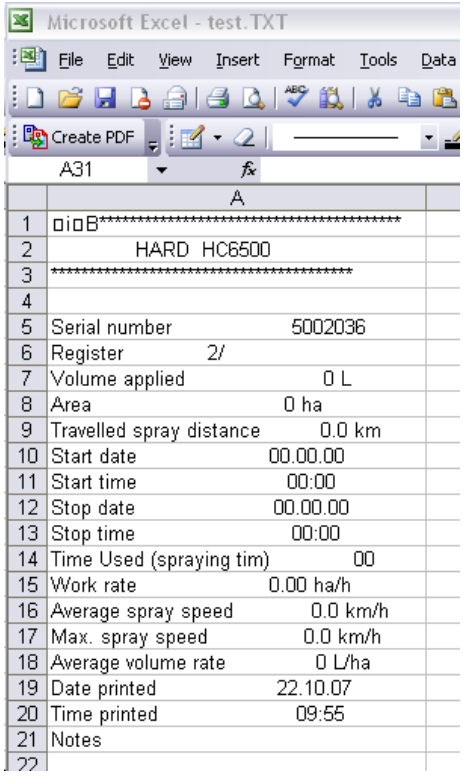
To set up the Emulation in HyperTerminal select in the File menu: Properties and then Settings	
If the data should be saved in a file the “Capture Text” need to be activated	
When the “Capture Text” is activated select a place to save the file	
When the controller is finished to transmit data select “Stop” or “Pause” in the menu	

If the terminal is open with wrong settings do following:	
The terminal can be connected or disconnected. It is not possible to change settings in the Connection and Port settings if the terminal is connected. Push the “phone” button to connect/disconnect. To change settings, push the “Properties” button in the menu.	

Handling data from HyperTerminal

The dumped data can be used in different ways. If the data is used for analyse later on, the data must be saved. If not necessary to save the data, the data will be shown on the PC screen and lost when the file is closed.
If the dumped data is to be opened with a spreadsheet after the transfer, the data must be saved on the PC. The data is saved as a Notepad data file. These files can also be opened in a spreadsheet (e.g. Excel) but it has to be done the right way.

Open the data file in Excel Open Excel and select “Open” file. Select “Files of type *.txt.”. Select the file to open, e.g. Test.TXT.	
Select OK in this warning window.	
Select “Delimited” as data type in the next window.	

Mark “Other:” with an “|” (press AltGr+|).	
Select “Finish”	
And Excel will open the file:	

Local Language maintenance

The HC5500 has UK, F, D, DK, SF and HU as standard languages. It can also store 2 local languages. This allows you to write and download a local language to the controller.

How to translate a language file

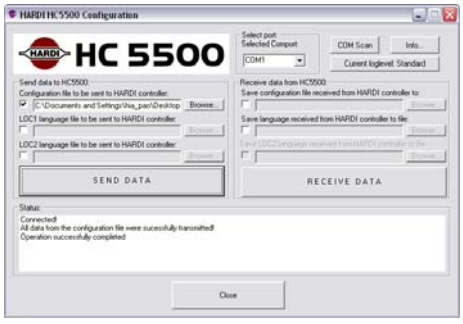
Select a file with a known language, e.g. English.
Open the file with Notepad, re-name it, and overwrite the text. Note that “MaxLength”, refers to the maximum number of letters that can be used. The spacebar also counts for a letter.
When finished, save it. Now it can be transferred to the HC5500 from a PC.
If you do not have the language file is it possible to download it from the controller. See section “Download language file from HC5500 to PC”.

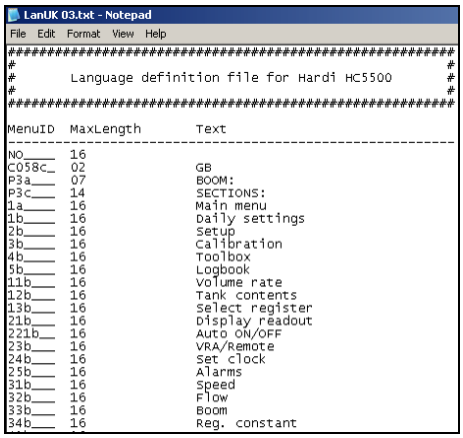
New software and local language

When the software in HC5500 is updated will the language file be deleted. Follow the next seven step to maintenance the local language.

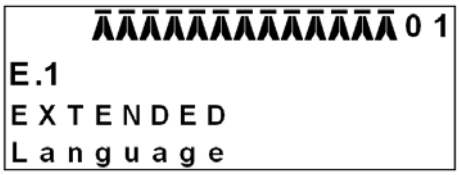
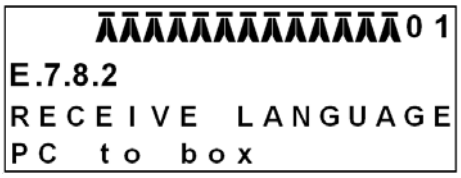
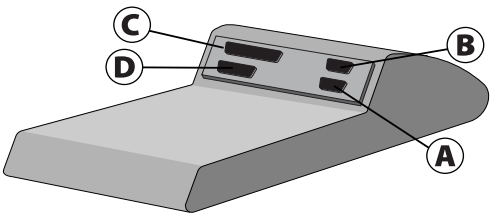
1. Transfer local language file from controller to the PC
2. Upload the new software to the controller and perform a master reset
3. Upload the same local language file to the controller again
4. If the new software has new menu lines, will these lines be in English
5. Transfer the local language file to the PC again
6. Translate the English menu lines to the current local language
7. Upload the local language file to the controller again

Begin with step two if you have the local language file on the PC.

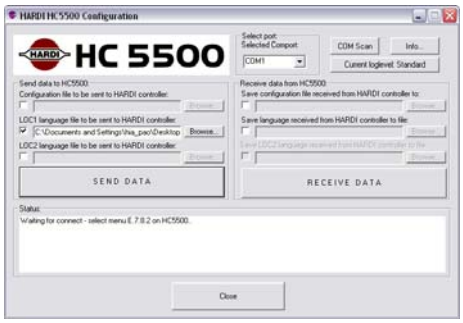
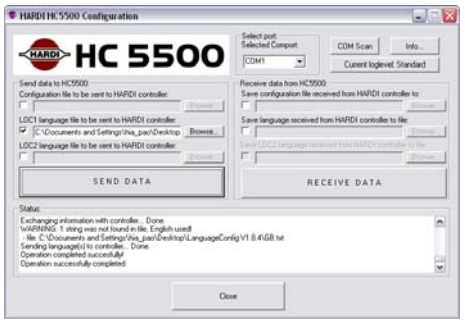
Configuration program for the HC5500. For transferring files from the PC to the HC5500 or to the PC a Configuration HC5500 program is needed. If you don’t have this program, Customer Service/Technical Service can supply it.	

Standard language files Language file opened in Notepad	

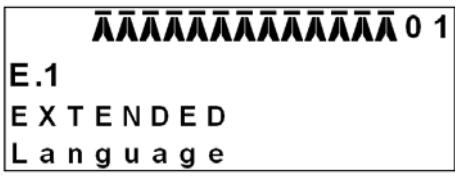
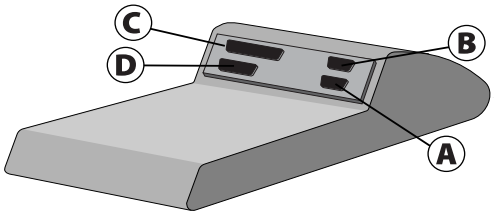
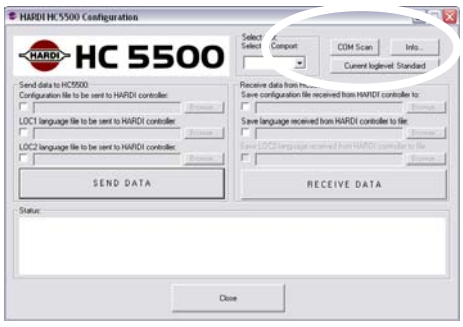
Transfer the language file from PC to HC5500

Power ON HC5500 in Extended Menu mode.	
Select E.7.8 Factory	
Select E.7.8.2 PC to box Push the “Enter” button	
Connect RS232 cable to HC5500 COM 1 (A) port. If using the HARDI communication cable P/N 72271600, connect the “Hardware halt” end of the cable to the PC.	

Open Language configuration program on the PC
Select COM port for PC.
In case of communication problems please activate the extended log level.
Push the "Current loglevel" button to toggle between standard and extended log level.
In case of trouble, pleas send the extended log file to Hardi service for future investigation.

Click “LOC 1” or “LOC 2” on left hand side and select your local language file to be sent with the browser function. Click “Send data” and follow instructions in the “Status” box. Push the “Enter” button on controller.	
Various messages will be showed in the display! Wait until the display show that it has send and received data and show “Hardware halt. Wait for connect” second time.	  
HC5500 software will show following box: Operation completed successfully!	

Download language file from HC5500 to PC:

Power ON HC5500 in Extended Menu mode.	
Select E.7.7 Factory Send language	
Select E.7.7.2 Send language Box to PC Push the “Enter” button	
Connect RS232 cable to HC5500 COM 1 (A) port. If using the HARDI communication cable P/N 72271600, connect the “Hardware halt” end of the cable to the PC.	
Open Language configuration program on the PC. Select COM port for PC. In case of communication problems please activate the extended log level. Push the "Current loglevel" button to toggle between standard and extended log level. In case of trouble, pleas send the extended log file to Hardi service for future investigation.	
Click “Save language received from HARDI controller to file:” on right hand side. Click “Receive data” and follow instructions in the “Status” box. Select language to download: UK, D, DK, F, SF, HU, Local 1 or Local 2. Push the “Enter” button on controller. Edit the file in a text editor, e.g. Notepad