

Instruction

Phocos CX charge controller software

Directory

1.	system requirements	3
2.	Set up the CX charge controller menu for communication	4
3.	Install the driver for the Interface cable	6
4.	Install the software	7
5.	The software	14
	5.1 Choose the Comport and connect the charge controller	14
	5.2 State of the charge controller and current values	16
	5.3 Load in datalogger data	18
	5.3.1 General datalogger values	29
	5.3.2 datalogger data from last week, last months and	
	last year	20
	5.4 check your system	23
	5.5 Save data	25
	5.6 Load data	26
	5.7 Set the charge controller menu	27
	5.8 Set night light functions	28
	5.9 Use the help	31
6	. Remove the software from your computer	32
7	. Technical support by problems	35

1. system requirements

Windows xp

The software runs under windows xp.

You need free memory: 4MByte

Windows 98, 2000 and Me

By Windows98, Windows2000 and Windows me you must install the Microsoft Framework. You will found it at following internet address.

http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=262D25E3-F589-4842-8157-034D1E7CF3A3

Sometimes you need the Internet Explorer6.0. You will find it at following internet address:

http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=1E1550CB-5E5D-48F5-B02B-20B602228DE6

2. Set up the CX charge controller menu for communication

Program the CX charge controller as you see at the following pictures.

At first press the button on the charge controller long till you see Picture 1. Then press the button repeatedly short till you see picture 8. With each press on the button, the display will change as shown on the left side.

Picture 1. Picture 2. Picture 3. Picture 4. Picture 5. Picture 6. Picture 7.

Picture 8.

If you see this picture press the button long untill you see one of the pictures 8.1,8.2 or 8.3. Secondly press the button long untill you see the picture flashing. Then press the button repeatedly short till you see picture 8.3

Picture 8.1
Picture 8.2
Picture 8.3

After this press the button long to save the setting and then press the button short and you see the picture 8 again.

After this press short again and you will see picture 9.



If you see picture 9 press the button short and you will get out of the charge controller menu.

The charge controller is now ready for communication with the software.

3. Install the driver for the Interface cable

For this you must connect the Interface cable to a USB Port of your computer. To install the interface cable you don't need to have a connection to the charge controller you only need to connect the interface cable with the computer.

To install the driver for the interface cable use the installations guide on the CD at the following folder:

CX-I driver\InstallationsGuide.pdf

4. Install the software

To install the software you have to start setup.exe on the CD. Follow the instructions of the setup.

Step 1: Install the Microsoft Framework

Start setup and you will see the following picture when the Microsoft Framework isn't already installed on your computer. If it is installed look into step 2 of the installation.



Click to "Ja" and you will get to the next window.



Microsoft Framework installation is executing now.



Click "I agree" if you agree with license of the Microsoft Framework.

Hicrosoft .NET Framew	work 1.1 Setup
Microsoft net	Installing Components The following items are being installed on your computer .NET Framework Files
	Gathering required information

Installation of the components now.

🙀 Microsoft .NET Framework 1.1 Setup	$\exists \times$
Installation of Microsoft .NET Framework 1.1 is complete.	
<u>ОК</u>	

Finish of the Framework installation with a message.

Now the Framework is installed on your computer. You must start the setup.exe again to install the CX charge controller software now.

Step 2: Start the setup.exe to install the software

Start setup and you will see the following picture. Click to "Next" and you will get to the next window.

🕼 Phocos CX software			
Welcome to the Phocos C	K software S	etup Wizard	
The installer will guide you throug software on your computer.	Ih the steps req	uired to install Pho	ocos CX
WARNING: This computer progra international treaties. Unauthorized any portion of it, may result in seve prosecuted to the maximum exter	im is protected I d duplication or ere civil or crimi nt possible unde	by copyright law a distribution of this nal penalties, and er the law.	nd program, or will be
	Cancel	< Back	Next >

In this window you can choose the folder, the software should be installed to your computer.

🞼 Phocos CX software		
Select Installation Folder		
The installer will install Phocos C	K software to the following	folder. Ider, enter it below
<u>F</u> older:		
C:\Programme\Phocos\Phocos	s CX software\	Browse
		Disk Cost
Install Phocos CX software for yo Everyone Just me	ourself, or for anyone who u	ses this computer:
	Cancel < Ba	ck Next >

At the bottom of the window choose "everyone" that all users can start the software.

The following window shows to you, that the installation can begin now. Click "next".

뤻 Phocos CX software			
Confirm Installation			
The installer is ready to install Pho	ocos CX softwar	e on your compute	ər.
Click "Next" to start the installation	ı.		
	Capaol	< Book	Norta
	Cancer	Back	INEX(>

The software will be installed now.

뤻 Phocos CX software			
Installing Phocos CX softw	are		
Phocos CX software is being inst	alled.		
Please wait			
	Cancel	< Back	Next >

Setup finish the installation with the following window.



The software will be installed on the desktop and the windows start menu.



Start the CX_Software.exe and the software will run.

5. The software

5.1 Choose the Comport and connect the charge controller

Connect the charge controller cable with a USB Port of your computer and the other end with the charge controller Interface as in picture 5.1.

Interface socket



Picture 5.1 Interface of the CX charge controller

In the system control under

 \rightarrow hardware

→device manager

you will find a window, as in picture.2.

There you can see the Port Com connector which is installed on your computer. You must set this Com connector in the software as shown in the next step in picture.3.



Picture.2 Check the Com Port at the devices control.

Click "Comport" on the menu bar at the top and set the correct port number or click "automatic" and the software is searching automaticly for the right Com Port.

If your Com Port number is higher then 15 choose "manuell".



Picture.3 Setting of the comport in the CX Software

5.2 State of the charge controller and current values

You can switch between the different windows of the program by clicking on the buttons on the left side. ("Status", "Current Values", ..., "CX menu", "Night Light").

If you click on "Status" you will see the Status window. Click on "Read From Charge Controller" and the window shows you some important details about the system as in picture 5.2.1. and some current values if you click on the button "Current Values" as in picture 5.2.2.



Picture.5.2.1 state display from the controller

- 1 battery type liquid lead acid or gel battery voltage
- 2 the voltage when the charge controller should disconnect the load from the battery to protect it.
- 3 Buzzer which is sounds when the battery becomes empty
- 4 load settings for the night
- 5 button lock (the charge controller menu button is locked or not)
- 6 here you can see load on or off at the charge controller at the moment and if the charge controller knows it's NIGHT or DAY at the moment

Language Comport	e Controller Help Screen		
Comport: COM8	Current Values	6	
Read From Charge Controller	Battery Information		
Statue	Battery Voltage in V:	13,1	
Status	Battery State Of Charge in %:	97	
Current Values	Soc voltage change effected by setting adaptiv in V:	0,1	
Datalogger	End of charge voltage:	14	
Last Week	Battery Charge Mode:		
Last Month	Other Information		
Last Year	CY Version	64	
System Performance	Hours Since Night Begin	0	
	Night Lenght Last Night (in hours):	12	
Load Data	Temperature in C:	13	
Save Data	- Present Ouwart data		
Clear CX Datalogger	Fresenii Currenii uala		
	Nominal Current:	10 A	
Menu Setting	Ecxess energy (PV generator) in %:	100	
Night Light	PV Current in % (from nominal current):	0	
Send To Charge	Load Current in % (from nominal current):	0	
Controller			

Picture.5.2.2 current data of the charge controller

Explaining the data of the current values window

Battery Information:

- battery voltage in V, is the current battery voltage
- Battery state of charge in %
- Soc voltage change effected by setting adaptive in V
- End of charge voltage in V
- the battery charge mode (BOOST = 14,4V/28,8V or EQUAL= 14,8V/29,6V)

Other Information:

- versionsnumber of the the CX Controller
- the hours since begin of the night
- length of the last night in hours
- temperature in °C

Present Current data:

- Nominal current of the CX Charge Controller
- Current excess energy (energy of PV generator which the system can't use at the moment)
- photovoltaic current in percent of the nominal current
- load current in percent of the nominal current

5.3 Load in datalogger data

You can see the datalogger data of the charge controller if you click on one of the following windows buttons:

• Datalogger with general data of the datalogger

- Last Week with data of the last seven days (week).
- Last Month with data of the last four weeks (month).

• Last Year with data of the last twelve months(year).

5.3.1 General datalogger values

You can see the datalogger data when you click on "Datalogger". If you click on "Read From Charge Controller" you can download the current saved data from the Charge Controller.

Holp Scroop	
Datalogger	
Battery Information	
Number of low battery load disconnects:	0
Number of weeks without fully charged battery:	1
Number of months without fully charged battery:	0
Amperehours	
PV Amperehours:	0
Load Amperehours:	0
Other Information	
Average battery state in the mornings in %:	82
Start Of Recording (Days):	10
	Help Screen Datalogger Battery Information Number of low battery load disconnects: Number of low battery load disconnects: Number of weeks without fully charged battery: Number of months without fully charged battery: Amperehours PV Amperehours: Load Amperehours: Other Information Average battery state in the mornings in %: Start Of Recording (Days):

Picture 5.3.1.1 Data of the charge controller datalogger

Battery Information:

- Number of low battery load disconnects (there are the disconnects to save the battery from too deep charge state)
- weeks / months without fully charged battery

Amperehours

• Amperehours of the load and the solar generator

Other Information:

- average of the battery charge state in the mornings
- Number of days since the last clear of the datalogger (recording days)

5.3.2 datalogger data from last week, last month and last year

The windows "Last Week", "Last Month" and "Last Year" are built like the same.

Explanation according to the data from last week.

oort: COM10	Last V	Vee	k					
ad From Charge Controller	Day1 is the latest:	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
	Max Battery Voltage:	14,5	13,5	14	14,1	14,3	13,7	13,5
Status	Min Battery Voltage:	11,9	11,9	12,1	12,2	11,7	11,7	11,8
rrent Value	State Of Battery Charge in % morning:	87	89	89	90	93	90	87
ataloggor	State Of Battery Charge in % evening:	99	99	99	96	99	97	99
ataloggei	PV Amperehours:	9	6	8	8	8	8	8
ast Week	Load Amperehours:	8	8	8	8	8	8	8
ast Month	PV Excess Amperehours:	18	18	10	15	19	15	16
aet Vear	Max PV Current in % (Nominal Current):	67	70	65	65	70	72	70
	Max Load Current in % (Nominal Current):	17	17	7	17	17	17	17
Load Data	Fully Charged Battery: Low Battery Load Disconnects:		-	-	-	-	-	-
Save Data	PV Overcurrent:							
CX Datalogger	Load Overcurrent:							
_	PV Overvoltage:							
enu Setting	Overtemperature:	8	8	8				
light Light		1		.				

picture 4 data from last week

If you look into the "Last Week" window you will see two buttons at the bottom of the window. There you can toggle between data and diagrams.

Explaining of the data:

- maximum battery voltage at this day
- minimum battery voltage at this day
- state of battery charge in % of the battery in the morning
- state of battery charge in % of the battery in the evening
- PV amperehours at this day
- load amperehours at this day
- excess energy of the solar generator at this day
- maximum current of the solar generator at this day
- maximum current of the load at this day

A empty battery on this day will shown you which: A fulload battery on this day will shown you which:

Furthermore, failures like overtemperature, overcurrent etc. are shown here.

Using the button diagram you can look at four different diagrams from the datalogger. At picture 5.3.2.2. and picture 5.3.2.3. you see some examples.



Picture 5.3.2.2 diagram of the minimal and maximal battery voltage

In picture 5.3.2.3 you can see a diagram about the amperehours. The blue bars are the excess energy. The load energy bars are red and the used solar generator energy bars are yellow.



picture 5.3.2.3 amperehours solar generator, load, excess

The data of "Last Month" and "Last Year" can also looked up. But this data are average data about each week respectively each month.

The min and max battery voltage and min and max currents are the min and max values for each week respectively each month.

5.4 Check your system

Click on "System Performance" and you will see a window like picture 5.4.1.



5.4.1 System Performance

The System Performance shows you how good was the load supported with energy.

Following questions should be answered:

- Can the PV generator support the system always or is there sometimes to less energy?
- Would the battery handled so that a long life is guaranteed?
- Is the energy store (battery) big enough to have a good safety of supply?

Average data about the system:

If you click on "Average Data" in the System Performance window. You can look about average data and disturbances in the System.

ystem Perform	ance		
System Performance	Average Data		
	Daily Average		
Average Data	PV Energy Usage in %:	50	
	Load Amperehours:	4	
	PV Amperehours:	3	
	Weekly Average		
	PV Energy Usage in %:	9	
	Load Amperehours:	0	
	PV Amperehours:	0	
	Monthly Average		
	PV Energy Usage in %:	0	
	Load Amperehours:	0	
	PV Amperehours:	0	
	Disturbance		
	PV currer	it was over the nominal current	
	The batte	ry voltage was too high	
	The temp	erature was too high	

5.4.1 Average Data

5.5 Save data

You have the possibility to save data from the datalogger in a excel file or text file. For this click to "save as excelfile" or "save as txt".

Further you can save the data so that you can reload it into the software again at a later time. For this click "save for reading into the software again"

omport: COM8	S	ave Data	
	–		
Read From Charge Controller	Data For Reloading		
Status	File Name:		Save for reading into the software again
Current Value			
Datalogger	Data Save As Excel File or Txt	he reloaded again in the software	
Last Week	To change a wells where the file of		
Last Month	and then on "take file path" to take f	the file path.	ie new opena window cick ok
Last Year	Search Path Tak	ke File Path	
ystem Performance	The data will saved at following path	κ.	
Load Data	File Name:		
Save Data	Date:		
Clear CX Datalogger	Location:		
	Charge Controller Identification:		
Menu Setting	Battery capacity:		Save as excel file
Night Light	PV Power:		
Send To Charge	Ni-Alia		Save as txt

Picture 5.5.1 save data

To save as excel or txt file click first "search path" and choose a path in the opend window. After this click ok an "Take File Path". The path will shown to you. Now you must give the file a name and you can save more details like battery capacity or power of solar generator.

5.6 Load data

You have the possibility to reload data which you have saved before.

To do this you must click on "load" at the "Load data" window. When you have choosen the charge controller file which you want to load click on "load".

🖶 PHOCOS CX charge	econtroller	_ 🗆 ×
file language comport	help	
comport: COM8	load saved data	
read from chargecontroller		
Chargecontroller Values	lie1	
datalogger last week		
last months last year		
datalogger interpretation		
save data		
CX menu nightlight		
send to chargecontroller		
	load delete	

Picture 5.6.1 load data

5.7 The charge controller settings menu

The menu settings:

- Set the battery voltage when the charge controller should disconnect the load to protect the battery.
- State of battery charge buzzer (when this function is on a buzzer beep by the different charge states of the battery)
- Lock the menu (Then you can't use the menu button on the charge controller)
- Set the battery type (gel / liquid)

Comport: COM8	Menu Setting			
Read From Charge Controller	Total Discharged Battery Protection			
Status	C Low voltage disconnect current com	pensated 11.4 -11.9V		
Current Value	C Low voltage disconnect current com	pensated 11.0 - 11.75		
Datalogger	C Low voltage disconnect current com	C Low voltage disconnect current compensated/adaptiv 11.0 - 12.2V		
Last Week	C Low voltage disconnect 11.5V			
Last Month	C Low voltage disconnect 11.0V			
Last Year				
System Performance	Battery Type	CX Menu Button	Acoustical Battery State Of Charge Signal	
Load Data				
Save Data			BUZZER	
Clear CX Datalogger	C timidt out toid	Charlest	C C	
	C Gel Or AGM Lead Acid	C Unlocked	Coff	
Menu Setting				
Night Light				

picture 5.7.1 menu settings

5.8 Set night light functions

You have three possibilities to set the nightlight function. This is a function where you can switch on the load at definite times at night. The load will be switched off during the day.

- load on/off hours before sunrise / hours after sundown or set a time for load on/off
- Load on the whole night
- No night light function (then you can set load on and off manually with the charge controller button)

Load on hours before sunrise / hours after sundown

In this function you must set the hours before sunrise and hours after sundown when the load should be on. After this click to "Send To Charge Controller". If you click to "read from charge controller" you can check the current setting of the charge controller.

Language Compor	t Help Screen		
Comport: COM8	Night Light Function		
Read From Charge Controller	Select Night Light Function:		
Status	C Load On/Off Time Setting	Load On After Dusk	Load On Before Dawn
Current Value	C Load is on the whole night	Time Period Setting	Time Period Setting
Datalogger	C No Night Light Function	C 0 Hours	C 0 Hours
Last Week		C 2 Hours	C 2 Hours
Last Month	Dusk Dawn	C 3 Hours C 4 Hours	C 3 Hours C 4 Hours
Last Year	day night day	O 5 Hours	6 5 Hours
System Performance	After dusk, load is on Before dawn, load is	Time Setting	Time Setting
Load Data		C 9 : 22 pm C 10 : 22 pm	C 3 : 22 am C 4 : 22 am
Save Data	-Day/Night Threshold	C 11 : 22 pm C 12 : 22 pm	C 5 : 22 am C 6 : 22 am
Clear CX Datalogger	Choose the voltage of the solar generator when chargecontroller should know it's day or night.	C 1 : 22 am This function depends from dusk and day	C 7 : 22 am
		use the Controller in a new location.	
Menu Setting	C 1.0V C 1.6V C 2.1V		Time Down 7 : 15 on
Send To Charge Controller	C 2.7V C 3.2V C 3.8V C 4.4V C 4.9V C 5.5V C 6.0V C 6.6V C 7.2V	set time for sunrise and sundown	Time Dusk 7 : 30 pm

Picture.5.8.1 set nightlight by hours before sunrise and hours after sundown

Set the time of sunrise and sundown, and then the time of load on

For this function you must first set the time of sunrise and sundown. Then choose the time when you want the load on.

🖶 PHOCOS CX Charg	je Controller				
File Language Comport	: Help Screen				
Comport: COM8	Night Light Function				
Read From Charge Controller	Select Night Light Function:				
Status Current Value	C Load On/Off Time Setting				
Datalogger	C No Night Light Function				
Last Week	Dusk Dawn				
Last Year	day 🏹 night 🗧 🧃 day				
System Performance	78 E LAK	Dawn	You only need to change the time settings for dusk and dawn when you		
Load Data		1	use the Controller in a new location.		
Save Data	Day/Night Threshold	7 :15 am			
Clear CX Datalogger	Choose the voltage of the solar generator when chargecontroller should know it's day or night.	Dusk			
Menu Setting	CARL CARL COAL	<u> </u>			
Night Light Send To Charge Controller	C 1.0V C 1.6V C 2.1V C 2.7V C 3.2V C 3.8V C 4.4V C 4.9V C 5.5V C 6.0V C 6.6V C 7.2V C 7.7V	7 : 30 pm	Apply the time setting		

Picture.9 set time for sunrise/sundown

Set the times for load on at morning or evening:



Picture.10 set the time for load on and off

5.9 Use the help

If you have problems, use the help function at the menu bar.



Picture 5.9 example of help

<u>6. Remove the software from your</u> <u>computer</u>

To remove the software from your computer click the "Change/Remove" button in the control center on "Add/Remove Programs"

🙀 Add/Remov	e Programs		
R	Currently installed programs:	Sort by: Name	•
Change cr	🔛 Adobe Acrobat - Reader 6.0.2 Update	Size	5.66MB 🔺
Programs	🖄 Adobe Acrobat 5.0	Size	78.3MB
	📷 Adobe Atmosphere Player for Acrobat and Adobe Reader		
2	🛃 Adobe Download Manager 1.2 (Remove Only)		
Add New	强 Adobe Photoshop Album 2.0 Starter Edition	Size	15.5MB
Programs	🔛 Adobe Reader 6.0.1	Size	44.2MB
**	🐉 Borland Delphi 5	Size	127MB
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	EC Software TNT Screen Capture 2.1	Size	9.07MB
Add/Remove Windows Components	😥 Phocos CX software	Size	3.3MB
Ç,	To change this program or remove it from your computer, click Change/Remove.	Change/Re	move
Set Program	🛃 Phocos CXI V1.0 Driver		
Access and	👔 HTML Help Workshop	Size	3.87MB
Derauits	XX IAR Embedded Workbench Kickstart for MSP430 V2.21B	Size	1.58MB
	🛃 InstantCD/DVD		
	Intel(R) Extreme Graphics Driver	Size	2.16MB

Picture 6.1

뤻 Phocos CX software			
Welcome to the Phocos CX	software 9	Setup Wizard	
Select whether you want to repair o	or remove Ph	ocos CX software.	
Repair Phocos CX software			
Remove Phocos CX software			
	Cancel	< Back	Finish

🕌 Phocos CX software		
Installation Complete		
Phocos CX software has been su	uccessfully removed.	
Click "Close" to exit.		
	Cancel < B:	ack Close

# 7. Technical support by questions

If you have questions about the software you can write an e-Mail on:

info@phocos.com

address of phocos:

PHOCOS AG Eberhard-Finckh-Strasse 10 D-89075 Ulm Germany

homepage: www.phocos.com