Manual
SAFT-option

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Manual

Software to NLG4

(Option SAFT charging profile)

Selection of the desired charging mode

Mode 1	Mode 2	
open	open	normal charge
open	closed	initialisation (commissioning) charge
closed	open	maintenance charge
closed	closed	confirm "water topping" / fast charge

With the two pushbuttons M(ode) 0 and M1 any of the four charging modes can be selected. Note, that the state of the mode inputs are only read at the time, when the charger is connected to the AC-mains after at least one minute off-mains operation. Manipulation of the mode inputs while charging or discharging will take no effect with one exeption: Both switches should be closed for a short time, when the control lamp "maintenace charge request" lits again during a Initialisation or maintenance charge. This will end the process of charging to allow water topping of the batteries, what should be done within the next few minutes.

Description of the program NLGMON.EXE

The program NLGMON.EXE is used for data visualisation during the charging process. In order to accept the data stream from the charger, it is recommended to run NLGMON on a PC.

Preparations: Connect the charger NLG4 directly to the preferred serial port.
If your computer has only a 25p connector, use a 25<->9p adapter.

Start of the program: (english version)

- - ->	NLGMON	
or	NLGMON 1	
or	NLGMON 1 E	starts the program for COM1: English language
- - - >	NLGMON 2	
or	NLGMON 2 E	starts the program for COM2: English language
- - - >	NLGMON D	
or	NLGMON 1 D	starts the program for COM1: German language
- - - >	NLGMON 2 D	starts the program for COM2: German language

This screen mask will apear:

```
+-----------------------------------------------------------------------------+
| NLG4 - monitor program on COM1:  SAFT-Ver.1.2 (C) 1995 by Brusa Elektronik   |
+-----------------------------------------------------------------------------|
|status NLG4:          |Um_pk[V]:      |Tpstg[°C]:       |power [%]:           |
|                      |               |                 |                     |
|Imains[Amp]:          |Umeff[V]:      |Tbat1[°C]:       |Pprim [W]:           |
|                      |               |Tbat2[°C]:       |F_out[Hz]:           |
|Ibatt [Amp]:          |Ubatt[V]:      |Tbatt[°C]:       |Psec  [W]:           |
+-----------------------------------------------------------------------------|
| section:  |1 wait |2prechg|3charge|4ovrchg|5 done |sum 1-5|  total  |calc.- |
+-----------+-------+-------+-------+-------+-------+-------+---------+-------+
|time  [min]|       |       |       |       |       |       |         |       |
+-----------+-------+-------+-------+-------+-------+-------+---------+-------+
|charge [Ah]|       |       |       |       |       |       |         |       |
+-----------+ Pilot-+Ovr-Chg+Dis-Chg+NormChg+FastChg+-------+---------+NextEqu|
|energy [Wh]|       |       |       |       |       |       |         |       |
+-----------+-------+-------+-------+-------+-------+-------+---------+-------+
|UB min. [V]|       |       |       |       |       |       |         |       |
+-----------+-------+-------+-------+-------+-------+-------+---------+-------| press
|UB max. [V]|       |       |       |       |       |       |         |       |  <F1>
+-----------+-------+-------+-------+-------+-------+-------+---------+-------|for help
|TB min.[°C]|       |       |       |       |       |       |         |       |
+-----------+-------+-------+-------+-------+-------+-------+---------+-------| press
|TB max.[°C]|       |       |       |       |       |       |         |       |  <F10>
+-----------------------------------------------------------------------------+to quit
```

with the following meanings:

Status: Operation or error status of the NLG4 (status 0 = O.K.)
decimal number, which consists (additive) of:

> malfunction	*	1
> error overvoltage mains	*	2
> error overvoltage battery	*	4
> error connection battery temp sensor #1	*	8
> error connection battery temp sensor #2	*	16
> error over-temperature battery	*	32
> error maximum energy overflow	*	64
> error maximum charge overflow	*	128
> error maximum time overflow	*	256
> error no maintenance charge was done	*	512
> error overtemperature at init. charge	*	1024
> error timeout after init. or maint. Charge	*	2048
> error precharge was notr successful	*	4096
> error safety timeout for main-charge section	*	8192
> error safety temp-rise in main-charge section	*	16384
> error safety timeout for over-charge section	*	32768

Section	:	section of the charging profile
Imains	:	current from mains
Ibatt	:	current to battery
Um_pk	:	voltage mains peak value
Umeff	:	voltage mains effective value
Ubatt	:	voltage of the battery
Tpstg	:	temperature of the power stage
Tbatl	:	temperature of the first battery temp. sensor
Tbat2	:	temperature of the second battery temp. sensor
Tbatt	:	maximum temperature of the battery temp. sensors
power	:	value of the power-limitation in percent
Pprim	:	primary (input) power

Psec   :secondary (output) power
F_out   :nominal switching frequency of the power stage

The values are listed separately for each section, as sum over all sections and as total value for the battery life:

time: charging time
charge: charged amp-hours
energy: charged amount of energy (only the 'sum'
and 'total' value
UB min: minimum battery voltage
UB max: maximum battery voltage
TB min : minimum battery temperature
TB max: maximum battery temperature

counters:
Pilot: software Amp-hours counter
OvrChrg: total overcharged Amp-hours (reset after maint.-charge)
DisChrg: total discharged Amp-hours
NormChrg: total normal charged Amp-hours
FastChrg:. total fast charged 'Amp-hours
NextEqu: discharged Amp-hours for the next equalisation charge

With "calc.-' some program internal sums for overcharge calculations can also be shown on the screen.
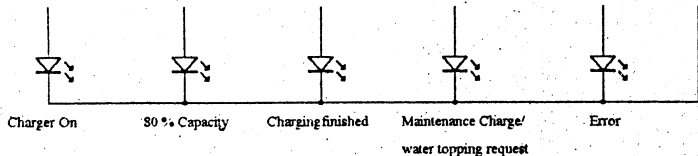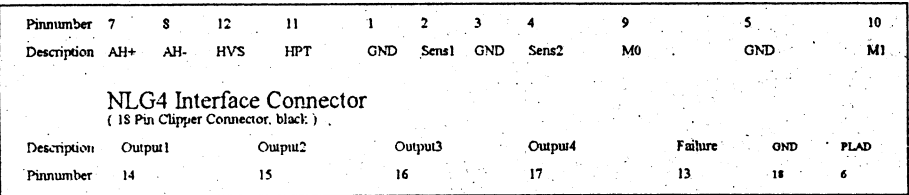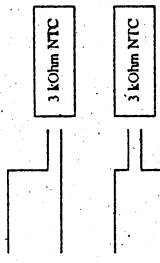
Now turn, on the charger and the mask will fill with the vialues.

With the F1O-key you can always quit the NLGMON program.

old
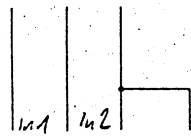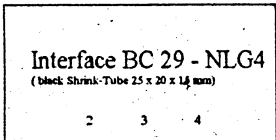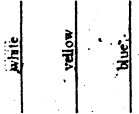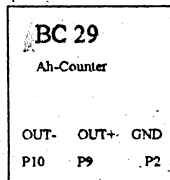
BC 29

Ah-Counter

OUT-	OUT+	GND
P10	P9	P2

white   yellow   blue

This wiring scheme is valid for NLG4-B SAFT
with charging profile SAFT.***

This version of charger has special Inputs for
the battery temperature sensors, the mode switches and
an interface to the AH-Counter BC-29

SAFT Battery Temperature Sensors

Interface BC 29 - NLG4
(black Shrink-Tube 25 x 20 x 14 mm)

2   3   4

3 kOhm NTC   3 kOhm NTC

M0   M1

In 1   In 2

Pinnumber	7	8	12	11	1	2	3	4	9	5	10
Description	AH+	AH-	HVS	HPT	GND	Sens1	GND	Sens2	M0	GND	M1

NLG4 Interface Connector
(18 Pin Clipper Connector, black)

Description	Output1	Output2	Output3	Output4	Failure	GND	PLAD
Pinnumber	14	15	16	17	13	18	6

Do not connect !

Charger On   80 % Capacity   Charging finished   Maintenance Charge/   Error
                                                    water topping request

Switch Position		Charge Mode
M1	M0	
open	open	Normal Charge
open	closed	InitialisationCharge
closed	open	Maintenance Charge
closed	closed	Fast Charge / Confirm "Water Topping"

Haupflader Nachlad.

20A PU_b 1,5h 5A
10A 1,5h —
20A PU_b 10A 3h
max U_b >16,6 40min

$P: Pilot = 0$
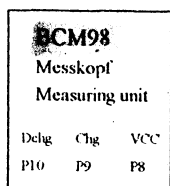$U_b = U_{Batt} > 163$

Bei U Batt < 120V → Precharge mit 10A
1h

Testen mit NLGMONS

Wiring of NLG4-B for SAFT NiCd Batteries

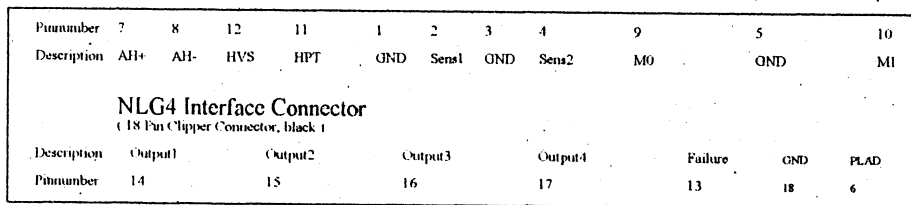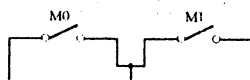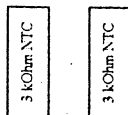| Size	Number		Revision
B			1
Date:	13-Oct-1995		Sheet 1 of 1
File:	C:\PROTEL\.\PIVCO2.SCH		Drawn By:Christof Zurbruegg

This wiring scheme is valid for NLG4-B SAFT
with charging profile SAFT.***

This version of charger has special Inputs for
the battery temperature sensors, the mode switches and
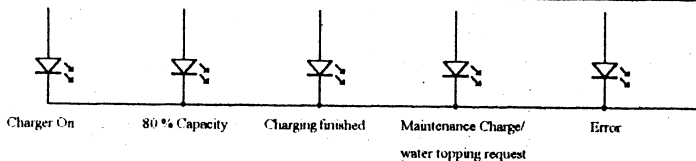to the Ah-counter BCM-98

new

BCM98
Messkopf
Measuring unit

Dchg	Chg	VCC
P10	P9	P8

SAFT Battery Temperature Sensors

3 kOhm NTC   3 kOhm NTC

M0   M1

Pinnumber	7	8	12	11	1	2	3	4	9	5	10
Description	AH+	AH-	HVS	HPT	GND	Sens1	GND	Sens2	M0	GND	M1

NLG4 Interface Connector
(18 Pin Clipper Connector, black)

Description	Output1	Output2	Output3	Output4	Failure	GND	PLAD
Pinnumber	14	15	16	17	13	18	6

Do not connect !

Charger On   80 % Capacity   Charging finished   Maintenance Charge/   Error
water topping request

Switch Position		Charge Mode	precharge	maincharge	overcharge
M1	M0				
open	open	Normal Charge	10A	20A	5A
open	closed	Initialisation Charge	10A	10A	-
closed	open	Maintenance Charge	10A	20A	10A
closed	closed	Fast Charge / Confirm "Water Topping"	ca. 25A	ca. 25A	-

Change from pre- to maincharge when Ub = ca. 120V

Change from main- to overcharge when Pilot = 0 oder Ub > ca. 160V

Details oder Probleme: Stefan fragen!

Title	Wiring of NLG4-B for SAFT NiCd Batteries		
Size **B**	Number	Revision **1**	
Date: 12-Jul-1999	File: C:\PUBLIC\NLG4SAFT\SAFTCONE.SC	Sheet 1of 1 Drawn ByMatthias Weiss	