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SERS Programmer

Version V

Hand programming device for SERS-controls

Manual

Edition April 2000

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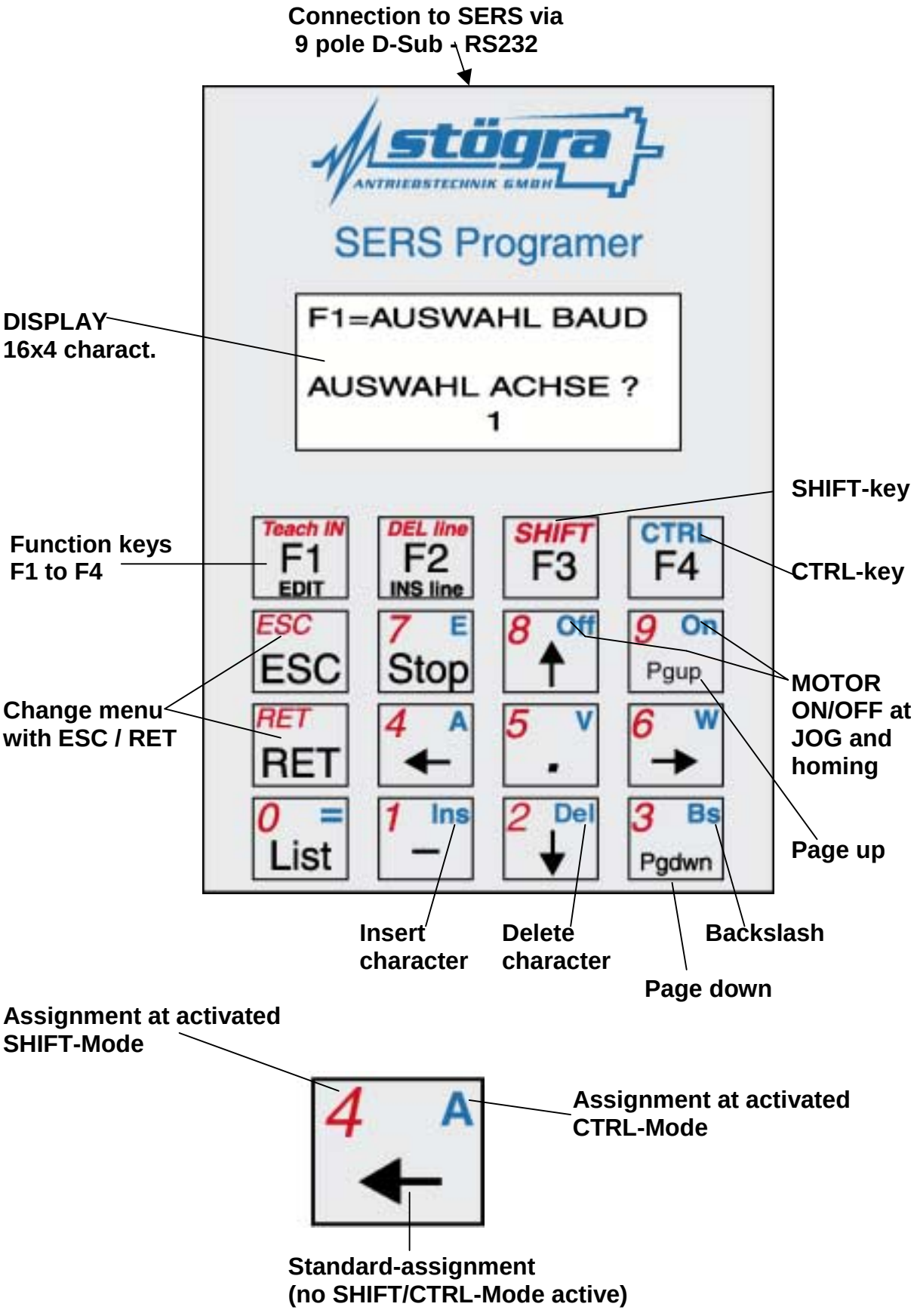
1. General notes

1.1 Overview SERS-Programmer - keyboard



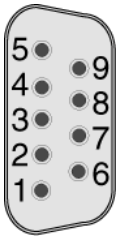
1.2. Connection SERS-Programmer to SERS-control

SERS-Programmer and 1 SERS-control:

The Pins 2,3,5 and 9 of the 9-pole connector of the **SERS-Programmer** have to be connected **1:1** with the Pins 2,3,5 and 9 at the 9-pole connector of the **SERS-control** (**Attention: NO Zero-Modem connection**)

Configuration of pins of the 9-pole D-Sub-connector:

Pin
1 : not connected
2 : RXD
3 : TXD
4 : not connected
5 : GND

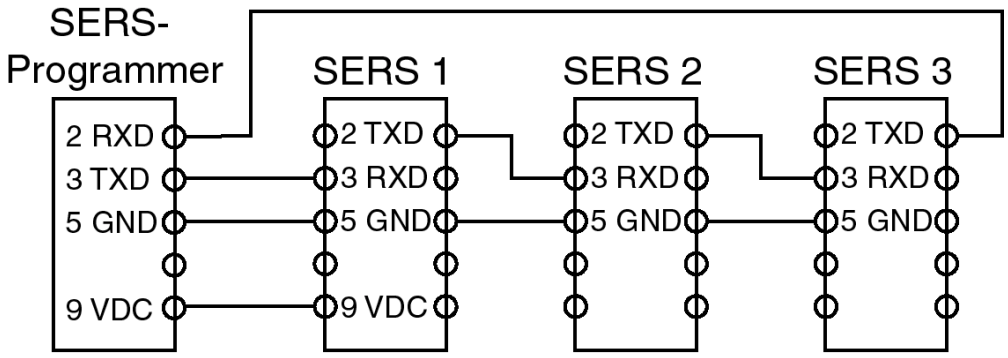


6 : not connected
7 : HSI (Hand Shake IN)
8 : HSO (Hand Shake Out)
9 : 9 VDC (supply SERS Programmer)

The Handshake connnections (Pin 7 and 8) are connected inside the SERS-Programmer, but are not evaluated in standard version.

SERS-Programmer and multiple SERS-controls:

Connecting diagram:



ATTENTION:
The SERS-Programmer is supplied via the Pin 9 at the 9-pole D-Sub-connector with 9 VDC by a SERS-control.
When connecting more than one SERS-controls, the SERS-Programmer should be supplied only by one SERS-control via Pin 9 !

Connecting cable SERS-Programmer - SERS control:
SHIELD connection:
The connecting cable between the SERS Programmer and the SERS control must include a shielding. The shield should be connected to GND (Pin 5 of 9-pole D-Sub-connector) at one end of the cable and not be connected at the other end of the cable ! ! !

1.3. Keyboard configurations

The keys of the SERS-Programmer are configured with one, two or three different characters/functions depending on the actual menu at the display !

At many menus only the keys F1, F2, F3, F4, ESC and RET with the standard configuration (black characters on the keys) are used.

The corresponding function for the function key is described in the actual display.
E.g.:

F	1	=	M	A	N	U	E	L	L		M	O	D	E
F	2	=	P	R	O	G	R	A	M		M	O	D	E
F	3	=	S	T	A	R	T		P	R	O	G	R	A	M
F	4	=	S	T	A	R	T		A	L	L	E			

Pressing the ESC-key or RET-key will return to the menu before (higher level menu).

At some menus the keys include up to three different configurations.
The different configurations of the keys are marked with different colours (black, red and blue).

The standard configuration of a key is the black character / sign.

Pressing the red SHIFT-key (F3-key) once will enable the SHIFT-MODE and the RED characters / functions on the keys.
The enabled SHIFT-Mode is indicated via the character "▲" at the display of the SERS-Programmer in the last line in the lines right end.
As long as this character is displayed, the red characters on the keys are enabled.

Example:

In the SHIFT-Mode the number "4" may be used during editing a program or when changing parameters in the parameter mode.

When pressing again the SHIFT-key, the SHIFT-Mode will be disabled and the character "▲" disappears at the display.

Pressing the blue CTRL-key (F4-key) once, will enable the CTRL-MODE and the BLUE characters / functions on the keys.
The enabled CTRL-Mode is indicated via the character "F" at the display of the SERS-Programmer in the right end of the last line.
As long as this character is displayed, the blue characters on the keys are enabled.

SHIFT-Mode and CTRL-Mode can be enabled only when changing parameters, when editing the program and in the Terminal-mode.

1.4. Additional characters

When editing a program and in the terminal modus via the key LIST there are

available additional characters.
With the arrow keys a character in the list can be selected and taken into the program or the terminal with the key RET.

With the keys "Pgup" and "Pgdwn" three different pages with characters may be selected.

1. page:

I	F		I	N		I		G	T		G	S		R	T
D		H		L		O		P		S		Z		X	
P	O	S		R	U	N		S	A	V	E			|	
!		*		?		=		#		/		+		&	

2. page:

"		A		B		C		D		E		F		G	
H		I		J		K		L		M		N		O	
P		Q		R		S		T		U		V		W	
X		Y		Z		^		<		>		[		]	

3. page:

:		a		b		c		d		e		f		g	
h		i		j		k		l		m		n		o	
p		q		r		s		t		u		v		W	
x		y		z		%		@		$		(		)	

2. Operation and programming
2.1 After Power ON

The SERS-Programmer starts operating immediately after connecting the supply voltage at the 9-pole D-Sub-connector.

After a 2-second initialisation phase the SERS-Programmer seeks for connected SERS-controls.
The baud rate and address, set at the SERS controls, will be recognised automatically (only drive addresses 1 to 3 are scanned automatically).

After finding a connected SERS-control following message will be displayed on the SERS programmer:

F	**1**	**=**	**A**	**U**	**S**	**W**	**A**	**H**	**L**		**B**	**A**	**U**	**D**	
A	**U**	**S**	**W**	**A**	**H**	**L**		**A**	**C**	**H**	**S**	**E**		**?**	
								1							

In case of only one connected SERS the displayed drive address (corresponds to the set address at the DIP-switch on the SERS-control) has to be confirmed with the "RET"-key.

In case two or more SERS-controls are connected to the SERS-Programmer, via the arrow keys "↑" and "↓" there can be selected the address of SERS-control to be programmed.
All following operations with the SERS-Programmer are sent only to the SERS-control with the here selected drive address (exception function START ALL).

If later another SERS-control shall be programmed , first in the above menu the corresponding address has to be selected via the arrow keys.

How to return to the menu to select a drive address is described in the chapter "Address/language menu".

After confirming the selected drive address with the RET-key the display changes to the main menu.

ERROR MESSAGES:

If after Power On the display shows **"*** kein Echo"**, then check the connections (Pins 2 and 3 must be connected 1:1 - see chapter 1.2).

If after confirming a drive address with the key RET, the message **"*** kein Antrieb adressiert"** is displayed, then verify the addresses set at the SERS-controls via the address switches and the selected address at "AUSWAHL Adresse ?" ("SELECTED AXIS ?").

2.2 General notes to the menus

The menus of the SERS-Programmer are designed as tree structure (illustrated in chapter 3 "menu tree structure").

Pressing the function keys F1 to F4, described at the menus on the display leads to the submenus.

Pressing the "ESC"-key or the "RET"-key results in jumping back to the higher level menu.

2.3 Main menu

The Main menu can be entered via confirming the selected drive address with RET or ESC after Power On (see 2.1 "After Power On") or from all other menus via jumping back to the higher level menus with ESC or RET until reaching the main menu.

F	**1**	**=**	**M**	**A**	**N**	**U**	**E**	**L**	**L**		**M**	**O**	**D**	**E**
F	**2**	**=**	**P**	**R**	**O**	**G**	**R**	**A**	**M**		**M**	**O**	**D**	**E**
F	**3**	**=**	**S**	**T**	**A**	**R**	**T**		**P**	**R**	**O**	**G**	**R**	**A**	**M**
F	**4**	**=**	**S**	**T**	**A**	**R**	**T**		**A**	**L**	**L**				

F1 → Jump to MANUAL MODE-menu (see 2.7)
F2 → Jump to PROGRAM MODE-menu (see 2.14)
F3 → Jump to START Program (see 2.5)
F4 → Jump to START All (see 2.6)

ESC or RET → Jump to Address/language menu

2.4 Address/language menu

When pressing ESC or RET in the main menu the Address/language menu is displayed.

F	**1**	**=**	**A**	**U**	**T**	**O**		**A**	**D**	**R**	**/**	**B**	**A**	**U**	**D**
F	**2**	**=**	**M**	**A**	**N**		**A**	**D**	**R**	**/**	**B**	**A**	**U**	**D**	
F	**3**	**=**	**D**	**E**	**U**	**T**	**S**	**C**	**H**						
F	**4**	**=**	**E**	**N**	**G**	**L**	**I**	**S**	**H**						

F1 → Automatically scanning of connected SERS-controls
- Baud rate and address (1 to 3) are scanned automatically
- Menu on display described at "2.1 After Power On"

F2 → Jump into the menu, as described at "2.1 After Power On"
- Baud rate and address are not scanned automatically (manual setting of the address as at "2.1 After Power On" and there with F1 possibility to select a baud rate manually - via the arrow keys)

F3 → Selection of German language (for SERS-Programmer and SERS-control)

F4 → Selection of English language (for SERS-Programmer and SERS-control)

ESC or RET → Jump to Main menu

2.5 START Program

Pressing F3 in the main menu enters the "START Program" - mask.

F	**1**	**=**	**S**	**T**	**A**	**R**	**T**		**F**	**4**	**=**	**S**	**T**	**O**	**P**
I	**N**	**:**	**0**				**O**	**1**	**:**	**0**		**O**	**2**	**:**	**0**
W	**2**						**O**	**3**	**:**	**0**		**O**	**4**	**:**	**0**
0	**.**	**0**	**0**	**0**	**0**	**-**	**o**	**k**							

Following SERS-diagnostics are displayed here:
- After "IN" in the 2. line on the display the inputs are shown (digital inputs I1 to I8 binary coded).
- The state of the outputs are shown at O1 to O4.
- In the 3. line below "IN" (in the 2. Line) are shown error / warning messages.
  - If the space is empty, then there is no warning or error at the moment.
  - warnings are indicated with "W" and the content of P12 (see manual SERS). e.g. "W2" indicates a temperature warning.
  - errors are indicated with "E" and the content of P11 (see manual SERS)
- In the 4th line the actual position is indicated
- An "-ok" after the position shows that the motor stands still

Pressing "F1" starts the actual SERS-Program (operational program in the EEProm of the SERS-control).
Pressing "F4" or the "STOP"-key interrupts or terminates (see description of parameter P1033 in manual SERS) the program.

Pressing "ESC" or "RET" returns to the main menu.

2.6 START All

Pressing F4 in the main menu enters the "START All" - Mask.

In case of two or more connected SERS-controls to the SERS-Programmer, with the "START ALL"-function all axis can be started simultaneously.

F	**1**	**=**	**S**	**T**	**A**	**R**	**T**		**F**	**4**	**=**	**S**	**T**	**O**	**P**
A	**L**	**L**													

F1 → The command START-program will be sent to all connected SERS-controls ("RUN-command with broadcast address "*" : #*RUN)

F4 → The command STOP will be sent to all connected SERS-controls ("STOP-command with broadcast address "*" : #*S)

ESC or RET → Return to main menu

2.7 MANUAL Mode - Menu

Pressing F1 in the main menu enters the "MANUAL Mode" - Menu.

F	**1**	**=**	**P**	**A**	**R**	**A**	**M**	**E**	**T**	**E**	**R**			
F	**2**	**=**	**J**	**O**	**G**									
F	**3**	**=**	**R**	**E**	**F**	**E**	**R**	**E**	**N**	**C**	**E**	**P**	**O**	**S**
F	**4**	**=**	**T**	**E**	**R**	**M**	**I**	**N**	**A**	**L**		**M**	**O**	**D**	**E**

F1 → Parameter-Menu (see 2.8)
F2 → JOG-Menu (see 2.11)
F3 → HOMING-Menu (see (2.12)
F4 → Terminal Mode (see 2.13)

ESC or RET → Return to main menu

2.8 PARAMETER - Menu

Pressing F1 in the MANUAL Mode - Menu enters the PARAMETER - menu.

F	**1**	**=**	**A**	**L**	**L**									
		P	**A**	**R**	**A**	**M**	**E**	**T**	**E**	**R**	**S**			
F	**2**	**=**	**R**	**E**	**S**	**E**	**T**							
		W	**A**	**R**	**N**	**I**	**N**	**G**	**/**	**E**	**R**	**R**	**O**	**R**	**S**

F1 → Parameter Mask (see 2.9)
F2 → RESET Menu (see 2.10)

ESC or RET → Return to main menu

2.9 PARAMETER - Mask

Pressing F1 in the PARAMETER - Menu enters the PARAMETER - Mask.
If no password was requested yet (e.g. when entered the PROGRAM Mode Menu) then now a password is requested.
The password is defined in the SERS-control.
Each connected SERS-control requires a password once after a Power-On-Reset, before the parameter and program section may be entered.

P	**A**	**S**	**S**	**W**	**O**	**R**	**T**	**?**							

The input of a 4-digit number is expected (switch assignments of keys to red letters/numbers - SHIFT Mode of keys).

After confirming the password with RET the PARAMETER-Mask is shown.

If the input password is correct, then all SERS-Parameters are shown.

If the input password is not correct, then only these parameters are shown, which are enabled in the SERS also without password (parameters P1060 to P1065 - see manual SERS).

NOTE: In case no password is defined in the SERS:
When asked for the password in the SERS-Programmer only the RET-key may be pressed (no input of a password) to enable the display of all parameters.

If by mistake a wrong password was input:
The SERS-control must be restarted (Power-ON-Reset required) to be able to input a password again.

PARAMETER Mask:

F	**1**	**=**	**E**	**D**	**I**	**T**			**F**	**2**	**=**	**S**	**A**	**V**	**E**
P	**0**	**=**	**0**												
Z	**=**	**0**													
P	**2**	**=**	**0**												

With help of the arrow keys "↑" and "↓" and the Page up/down keys "Pgup" and "Pgdwn" the lines can be scrolled and the cursor can be moved to the different parameters.

F1 → The parameter marked by the cursor (2. line in the display) can be changed.
ATTENTION: For the input of numbers first the SHIFT-mode with the red key assignment must be enabled (pressing one time the SHIFT-key).
If characters have to be deleted or inserted, then the CTRL-mode with the blue assignment must be activated (pressing one time the CTRL-key and the key "Ins" for inserting of digits and "Del" for deleting characters)

No scaling is allowed at the input.
(e.g. V=3000 is correct - V=3000 **rpm** is **wrong**)

Pressing **"RET"** confirms the **changed value**, and **"ESC"** will **keep the old value**.

E.g.: Changing of the velocity - parameter "V" - The display must show the following lines:

F	**1**	**=**	**E**	**D**	**I**	**T**			**F**	**2**	**=**	**S**	**A**	**V**	**E**
V	**=**	**3**	**0**	**0**	**0**	**.**	**0**	**0**	**0**	**0**	**r**	**p**	**m**		
P	**1**	**0**	**0**	**=**	**0**										
P	**1**	**0**	**1**	**=**	**0**										

The velocity "V" shall be changed to 500 rpm.
For changing "V" the key F1 has to be entered. Then the display will be as follows:

V	**=**													

For being able to input numbers, the SHIFT-Mode must be enabled - press SHIFT-key . The enabled SHIFT-mode is indicated via the character "▲" in the display in line 4 at the right end of line

Now the number "500" may be input

V	**=**	**5**	**0**	**0**										
														▲

and confirmed with "RET".

<u>IMPORTANT NOTE:</u>
For saving the changes of the parameters permanently into the SERS EEPROM the key F2 (SAVE) has to be pressed. If the changes were not saved with F2, then after the next Power-ON-Reset of the SERS-control all changes will be lost..

After pressing F2 the SERS-control returns an "ok" to the SERS-Programmer.
"ESC" or "RET" returns to the Parameter mask.

Another ESC or RET → Return to the PARAMETER Menu

2.10 RESET - Menu

When pressing the key Taste F2 in the PARAMETER - Menu the RESET-Menu will be displayed.

F	1	=	R	E	S	E	T		E	R	R	O	R		
F	2	=	R	E	S	E	T		W	A	R	N	I	N	G

F1 → in the SERS actual error messages will be reset (P11=0)
F2 → in the SERS actual warning messages will be reset (P12=0)

ESC or RET → back to the PARAMETER Menu

2.11 JOG - Menu

When pressing the key F2 in the "MANUAL Mode" - Menu the JOG - Menu will be displayed.

F	1	=	S	L	O	W		L	E	F	T			
F	2	=	S	L	O	W		R	I	G	H	T		
F	3	=	F	A	S	T		L	E	F	T			
F	4	=	F	A	S	T		R	I	G	H	T		

Before the drive can be moved, the motor phase current must be ON. When the motor current is ON, the 7-Segment-display at the SERS-control shows a "5" (in case of no warning or error).
When pressing the "ON" key the motor current will be switched ON, when pressing the "OFF" key the motor current will be switched OFF. (**Note:** the CTRL-mode does not need to be active)

F1 → Drive runs slow left
F2 → Drive runs slow right
F3 → Drive runs fast left
F4 → Drive runs fast right

NOTE:
Whether the motor runs into the left direction when pressing F1 or F3, or if the motor in reality runs into the right direction, depends on the way of connection of the motor phases with the SERS-control (exchanging the both connections within one motor phase will change the running direction) !

The velocity and the acceleration of the running in the JOG mode can be adjusted via the parameters P1018 to P1020 (see manual SERS)

ESC or RET → Return to MANUAL Mode - Menu

2.12 HOMING - Menu

When pressing the key F3 in the "MANUAL Mode" - Menu, the HOMING-Menu will be displayed

F	1	=	S	T	A	R	T							
			H	O	M	I	N	G						
F	2	=	S	T	O	P								

Before starting homing the motor phase current must be ON.
(7-Segment-display at the SERS-control shows "4" → Motor current is OFF,
"5" → Motor current is ON)

Pressing the "ON" key will switch the motor current ON, pressing the "OFF" key will switch the motor current OFF. (**Note:** the CTRL-mode does not need to be enabled)

F1 → Homing of the drive will be started
(See also manual SERS - chapter homing)
F2 → the drive will be stopped

ESC or RET → Return to the MANUAL Mode - Menu

2.13 TERMINAL Mode

Pressing the key F4 in the "MANUAL Mode" - Menu enables the TERMINAL Mode.

Here all characters available at the keyboard (and the characters selectable via the function "LIST" - see chapter 1.4) may be sent direct to the SERS.

ATTENTION: Each new line sent to the SERS-control must begin with the character "#". Also the drive address must be sent once to the SERS for the SERS recognising, that the following characters are addressed to it.

E.g.: #1ON
The phase current of the drive with drive address "1" will be switched on.

NOTE: The Terminal Mode can be entered only with valid password.

ESC or RET → Return to the MANUAL Mode - Menu

2.14 PROGRAM Mode - Menu

When pressing the key F2 in the main menu then the "PROGRAM Mode" - Menu will be displayed.

If there was no request for the password yet (e.g. before the PARAMETER mask) then the input of the password is required now.
The password is defined in the SERS-control.
Each connected SERS-control requires the input of the password once after a Power-On-Reset, before the parameters and the program section can be accessed.

P	**A**	**S**	**S**	**W**	**O**	**R**	**D**	**?**							

The input of a 4-digit number is expected here (press SHIFT-key to enable the red numbers on the keys).

NOTE: If there is no password defined in the SERS-control:
When asked for the password in the SERS-Programmer only the RET-key may be pressed (no input of a password) to enable the display of the total program.

If by mistake a wrong password was input:
The SERS-control must be restarted (Power-ON-Reset required) to be able to input a password again.

In case of a correct password or if there is no password defined, then after pressing the RET-key following menu will be displayed:

F	**1**	**=**	**E**	**D**	**I**	**T**		**P**	**R**	**O**	**G**	**R**	**A**	**M**	
F	**2**	**=**	**N**	**E**	**W**		**P**	**R**	**O**	**G**	**R**	**A**	**M**		
F	**3**	**=**	**T**	**E**	**S**	**T**		**P**	**R**	**O**	**G**	**R**	**A**	**M**	

In case of a wrong password or if there is a password defined and only the RET-key was pressed (without input of a password), then following menu will be displayed:

F	**1**	**=**	**E**	**D**	**I**	**T**		**P**	**R**	**O**	**G**	**R**	**A**	**M**	

F1 → EDIT PROGRAM - mask (see 2.15)
F2 → NEW PROGRAM - mask (see 2.16)
F2 → TEST PROGRAM - mask (see 2.17)
ESC or RET → Return to main menu

2.15 EDIT PROGRAM - mask

When pressing the key F1 in the PROGRAM Mode Menu then the EDIT PROGRAM - Mask will be enabled.

IF a wrong password or no password (in case a password is defined in the SERS) was input before, then only the program lines are displayed, which are enabled in the parameters P1070 to P1074.

E.g.:

V	**E**	**L**	**O**	**C**	**I**	**T**	**Y**		**A**	**X**	**I**	**S**		**1**	
V	**=**	**1**	**0**	**0**	**0**	**.**	**0**	**0**	**0**	**0**					
D	**I**	**A**	**M**	**E**	**T**	**E**	**R**		**H**	**O**	**L**	**E**			
W	**=**	**1**	**0**	**.**	**0**	**0**	**0**	**0**							

All displayed value/parameter assignments may be changed now. To do that, the cursor must be positioned to the assignment to be changed by using the arrow keys and /or page up/page down keys.
After pressing F1 the assigned value can be changed
- by overwriting with a new value or
- by changing the single digits by using the arrow keys "↑" and "↓".

Pressing the RET-key will take the changed value into the program.
Pressing the ESC-key will keep the old value in the program.

In case the input password is correct the complete program will be displayed.

E.g.:

1	**:**	**O**	**N**											
2	**:**	**L**	**1**											
3	**:**	**"**	**V**	**E**	**L**	**O**	**C**	**I**	**T**	**Y**		**A**	**X**	**I**	**S**
	1		**"**												

By using the arrow keys "↑" , "↓", "→" and "←" and the page keys "Pgup" and "Pgdwn" all program lines can be reached.

Via the function keys F1 and F2 all together 4 functions can be called.

- **"EDIT"** → edit parameter assignments (e.g.: in program line 4:V=1000.0000 the value for "V" may be edited after pressing F1 - overwriting with new value or changing the single digits to higher or lower values by using the arrow keys "↑" and "↓" (**only parameter assignments may be edited with "EDIT" !**). Pressing the RET-key will take the changed value into the program and pressing the ESC-key will keep the old value.
- **"Teach IN"** (SHIFT-KEY and afterwards F2-key) → The display changes to the MANUAL Mode Menu and the drive can be moved by using the manual drive functions to the desired position. Pressing the RET-key this position will be taken into the program, by inserting automatically a new program line after the actually by the cursor indicated line : "W=' actual motor position"' (actual motor position is the position where the motor was moved with the manual drive functions)

NOTE to Teach IN: Pay attention to the correct positioning mode (absolute or relative positioning - parameter P1014)
With ESC the function will be truncated and no line will be inserted.

- **"INS line"** → after the by the cursor actual indicated program line there will be inserted an new line - any new command or assignment may be inserted into the program - all characters on the keys (black, blue via CTRL and red via SHIFT) and the additional characters via the "LIST"-key (see chapter 1.3 and 1.4) are available.
  The RET-key will take the new line into the program, the ESC-key will truncate the "Insert"-function.
  NOTE: For inserting a line before the first program line, the cursor must be positioned to the left side to the line numbering "1".
  If there are more than one commands or assignments in one program line, and a new program line is to be inserted between two commands in a line or before the next line, then the cursor must be positioned to the correct command within the line by using the arrow keys "→" and "←" , and after that the new command may be inserted **(Inserting a new line is done always after the command marked by the cursor !)**
- **"DEL line"** → The command actually marked by the cursor will be deleted. Before deleting the operator will be asked, if he really wants to delete the command (RET will delete the command, all other keys will truncate the "delete"-function)

NOTE: In contrary to the parameter changes, the program changes will be saved immediately permanently into the EEProm of the SERS-control (In case of parameter changes the saving of the new values into the EEProm will be done only after pressing the key F2 - see chapter 2.9)

ESC or RET → Return to PROGRAM Mode Menu

2.16 NEW PROGRAM - Mask

When Pressing the key F2 in the PROGRAM Mode Menu the NEW PROGRAM - Mask will be displayed.

N	**E**	**W**		**P**	**R**	**O**	**G**	**R**	**A**	**M**	**?**			
O	**L**	**D**		**P**	**R**	**O**	**G**	**R**	**A**	**M**				
W	**I**	**L**	**L**		**B**	**E**		**D**	**E**	**L**	**E**	**T**	**E**	**D**	**!**
R	**E**	**T**		**=**		**Y**	**E**	**S**						

ATTENTION !
Pressing the RET-key will delete the actual program in the SERS !
After that a new program can be input.
All functions as described in chapter 2.15 are available (in case of correct password)

ESC or RET → Return to PROGRAM Mode Menu

2.17 TEST PROGRAM - Mask

Pressing the key F3 in the PROGRAM Mode Menu will enable the
TEST PROGRAM - Mask.

Here the program can be executed step by step (command by command).

E.g.:

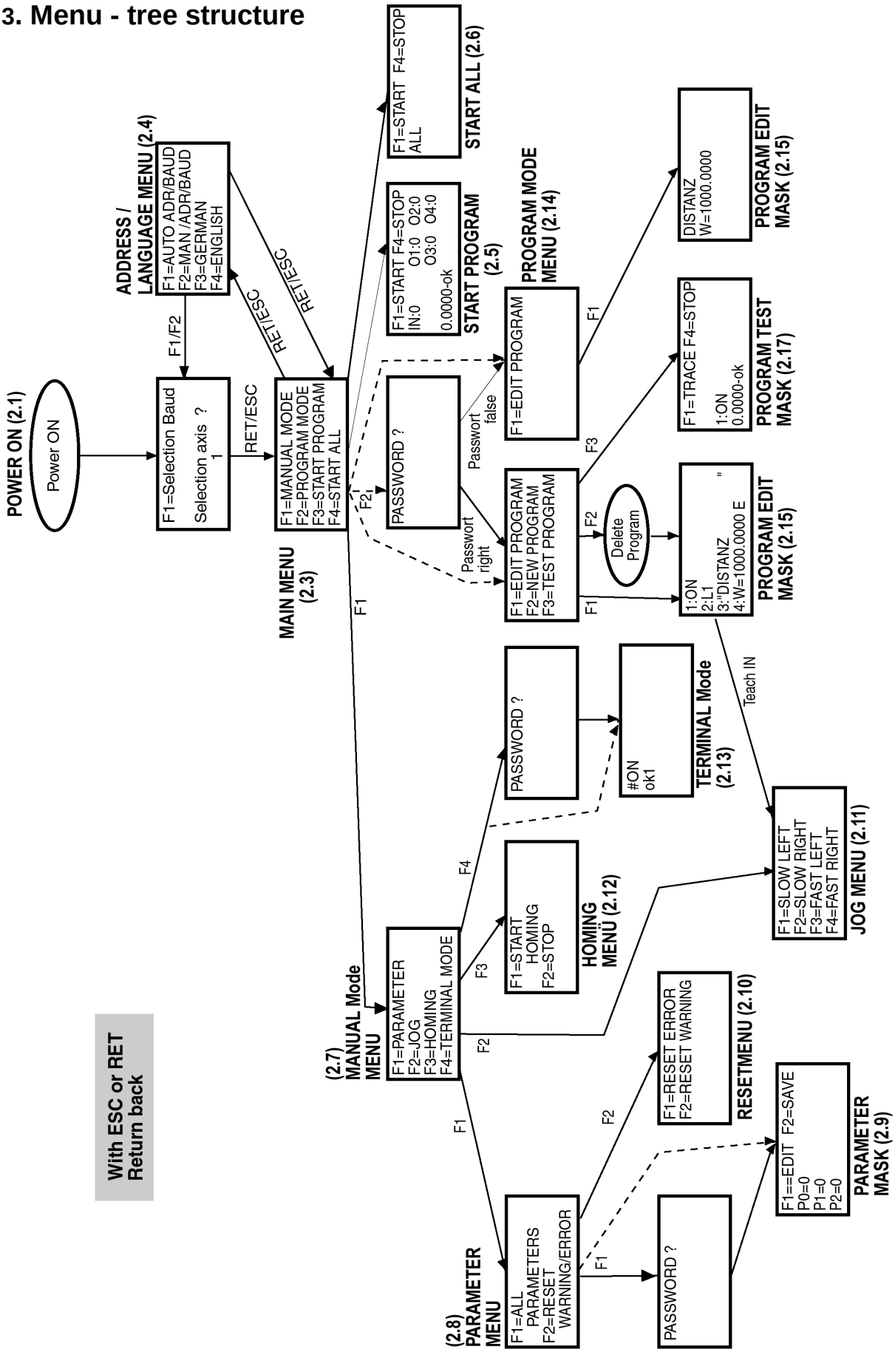
F	**1**	**=**	**T**	**R**	**A**	**C**	**E**		**F**	**4**	**=**	**S**	**T**	**O**	**P**
1	**:**	**O**	**N**												
2	**:**	**W**	**=**	**1**	**0**	**0**	**0**	**.**	**0**	**0**	**0**	**0**			
0	**.**	**0**	**0**	**0**	**0**	**-**	**o**	**k**							

2. line : last executed command in the program
3. line : next to be executed command
4. line : actual drive position (P51) and a "-ok" in case the drive does not move.

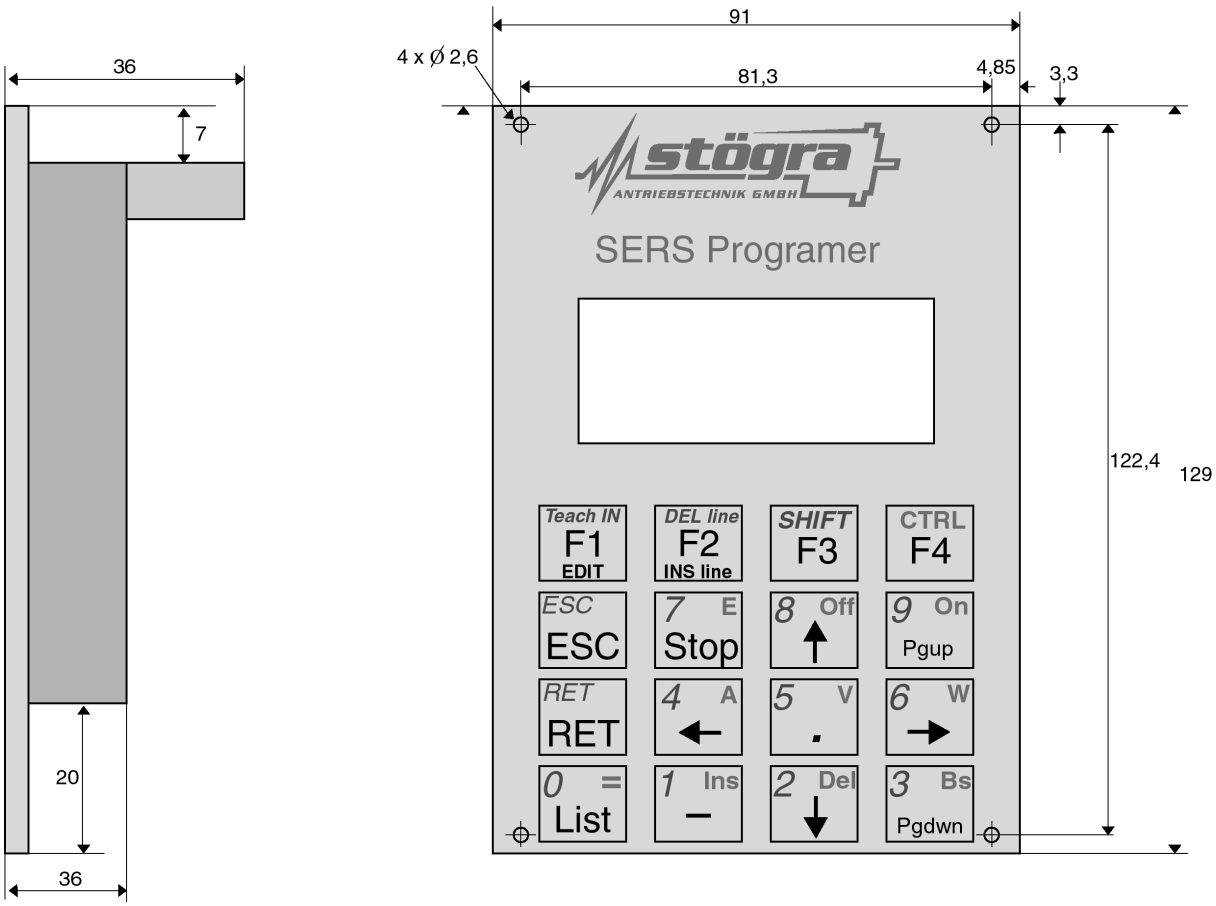
F1 → Next command (shown in 3. line on display) will be executed.
F2 → Actual command and drive will be stopped.

ESC or RET → Return to PROGRAM Mode Menu

3. Menu - tree structure



4. Dimensions



5. Technical specifications

Power supply : 9 VDC (ripple < 10%)

Current load : 30 mA

Protection : without housing : IP00 (front side IP65)
with housing : IP41 (front side IP65)