Invacare®

Programmer

Operating Instructions

This is how you can reach INVACARE®

If you have any questions or need support, you can reach us in Europe at the following addresses and phone numbers:

INVACARE POIRIER
Les Roches
F-37230 Fondettes
France
Service Après-Vente:
✈: +33 - (0) 2 47 - 62 64 15
Fax: +33 - (0) 2 47 - 62 64 64

INVACARE NEDERLAND
Celsiusstraat 46
NL-6716 BZ Ede
The Netherlands
✈: +31 - (0) 318 - 550 056
Fax: +31 - (0) 318 - 555 054

INVACARE Deutschland GmbH
Dehmer Str. 66
D-32549 Bad Oeynhausen
Deutschland
Customer Service
✈: +49 - (0) 5731 - 754 210
Fax: +49 - (0) 5731 - 754 216

Scandinavian Mobility A/S
Sdr. Ringvej 39
2600 Glostrup
Denmark
Customer Service:
✈: +45 - (0) 4345 - 6700
Fax: +45 - (0) 4345 - 6701

INVACARE AB
Fagerstagatan 9
163 91 Spånga
Sverige
Kundjänst:
✈: +46 - (0) 8 761 70 90
Fax: +46 - (0) 8 761 81 08

INVACARE Portugal Lda
Rua Senhora de Campanhã, 105
4369-001 Porto
PORTUGAL
✈: +352-225105946
Fax: +352-225105739

INVACARE (UK) Ltd
South Road
Bridgend
Mid Glamorgan - CF31-3PY
United Kingdom
Customer Service:
✈: +44 - (0) 1656 - 647 372
Fax: +44 - (0) 1656 - 649 016

Mecc San S.R.L.
Via Dei Pini, 35
I - 36016 Thiene (VI)
ITALIA
✈: +39 - (0) 445-380059
Fax : +39 - (0) 445-380034

REHADAP SA
c/ Areny, s/n
Poligon Industrial de Celrà
17460 Celrà (Girona)
ESPAÑA
✈: +34 - (0) 972 - 49 32 00
Fax: +34 - (0) 972 - 49 32 20

Table of Contents

General Information

These operating instructions describe the programmer's functions and operation with regard to the programming of the electronics of the Action Control System (ACS).

They include:

- A description of the display elements
- Information on how to connect the programmer
- Programming instructions

READ CAREFULLY BEFORE STARTING THE PROGRAMMING!

- The operating instructions are to be used in combination with the operating instructions of the wheelchair to be programmed.
- No further details are given on the operating and component descriptions mentioned in the operating instructions.
- All safety instructions must be observed.
- Information on the operation is to be taken from the operating instructions of the wheelchair.
- Subject to changes serving technological progress.
- The programming may only be performed by qualified personnel.
- The minimum requirement for a maintenance engineer is the appropriate experience in applying the programming software.
- Any alterations of the wheelchair program resulting from improper or incorrect programming will lead to an exclusion of liability on the part of INVACARE.

Important Symbols in these Instructions:

NOTE:
This symbol points to general information, which simplifies the handling of the wheelchair and calls the attention to special functions.

CAUTION: This symbol warns you against dangers!
• Observe these instructions to avoid personal injuries or damage to the wheelchair!

Safety and Programming Instructions

- **READ CARFULLY BEFORE SETTING INTO OPERATION!**
- PAY ATTENTION TO THE OPERATING INSTRUCTIONS OF THE PROGRAMMER AND OF THE WHEELCHAIR !

CAUTION: Danger of Injury!
• Modify the existing programmings only after consulting your therapist or physician.

- After finishing the programming, make sure to ALWAYS perform an operational test and a test drive.

General Information on the Programmer

1.0 The Programmer

Programmer

By means of the programmer you can intervene in the power wheelchair's programming and modify it according to the user's requirements.
The programming, which depends on the equipment of the wheelchair, is stored in the joystick box.

The programmer offers the following possibilities:
- Fine adjustment of the driving properties of any driving level.
- Fine adjustment of the joystick's response characteristics.
- Integration of external control elements into the ACS control. (Technical information K960102).
- Adaptation of the electronics to the different types of equipments.

NOTE:
Which parameters of the ACS control are editable, depends on the design and the equipment of the power wheelchair. Some of the parameters described in the following are not selectable in all wheelchair electronics.

2.0 Connection / Type Number

The programmer is connected to the programming socket of the joystick box by means of the connection cable.
The location of the programming socket for the connection of the programmer depends on the type of joystick box being used.
You will find more details in the operation instructions of the joystick boxes.

Front

By means of the type number (P/No.), each programmer can be easily related to the corresponding operating instructions.

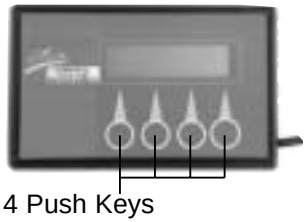
The present instructions belong to programmers bearing the type number:
DX - HHP - FAS

Back

3.0 The Push Keys

The input of the programming instructions is performed by means of four push keys, which are located in the lower area of the programmers front part
The push keys are designed as membrane keys which make the device resistant to environmental influences.

Push Keys



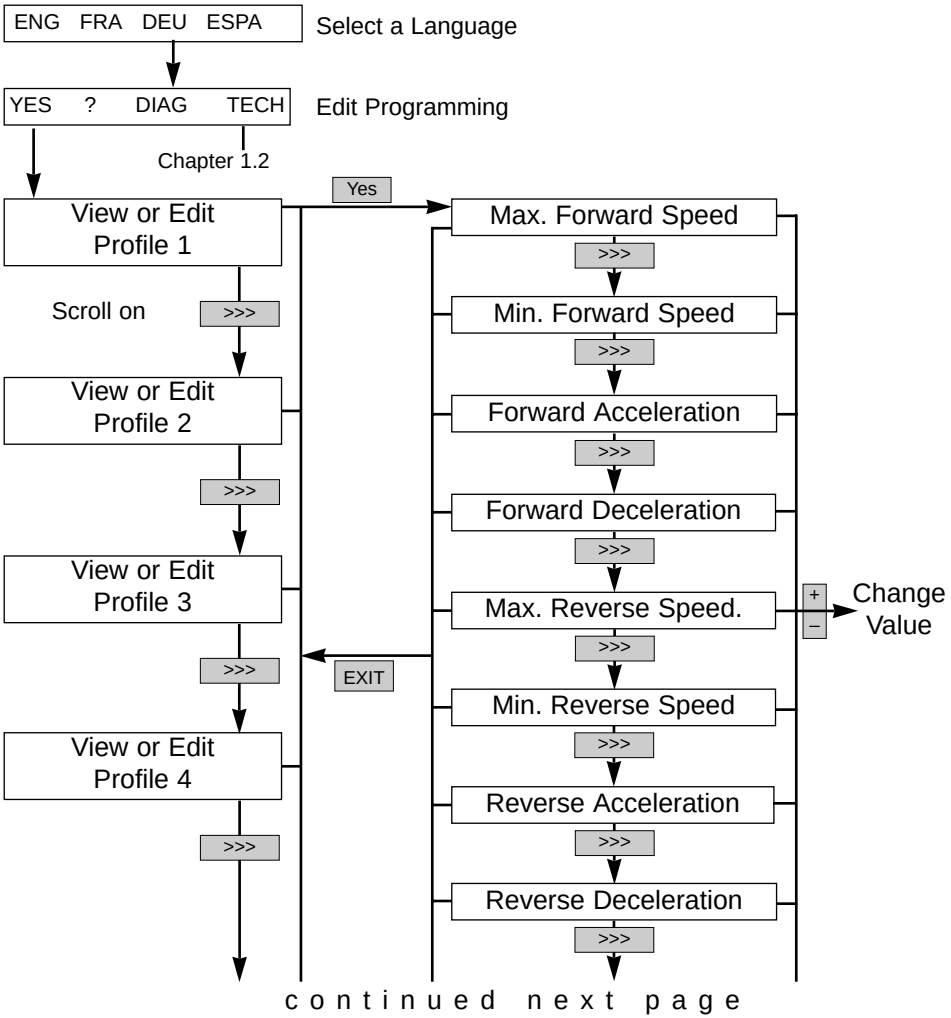
Part A Programming of REM 24 SC Joystick Boxes

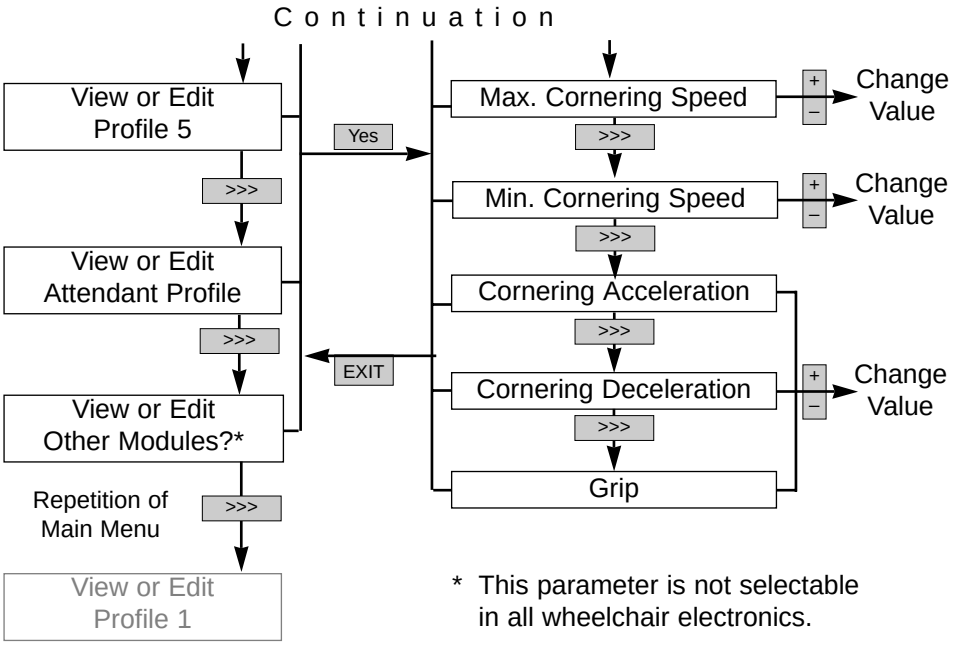
Table of Contents:

1.0 Brief Instructions REM 24 SC Joystick Boxes

The following brief instructions shall give you a general idea of the programming steps. It is imperative, however, to pay due attention to the detailed instructions contained in chapter “Operation”.
The sequence and display of the described programming parameters may differ according to the electronics of the wheelchair (i.e. G 40 / STORM).

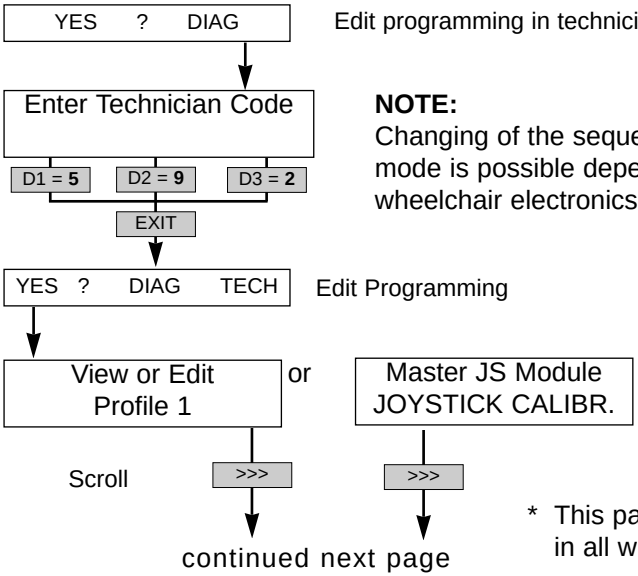
1.1 Standard Programming





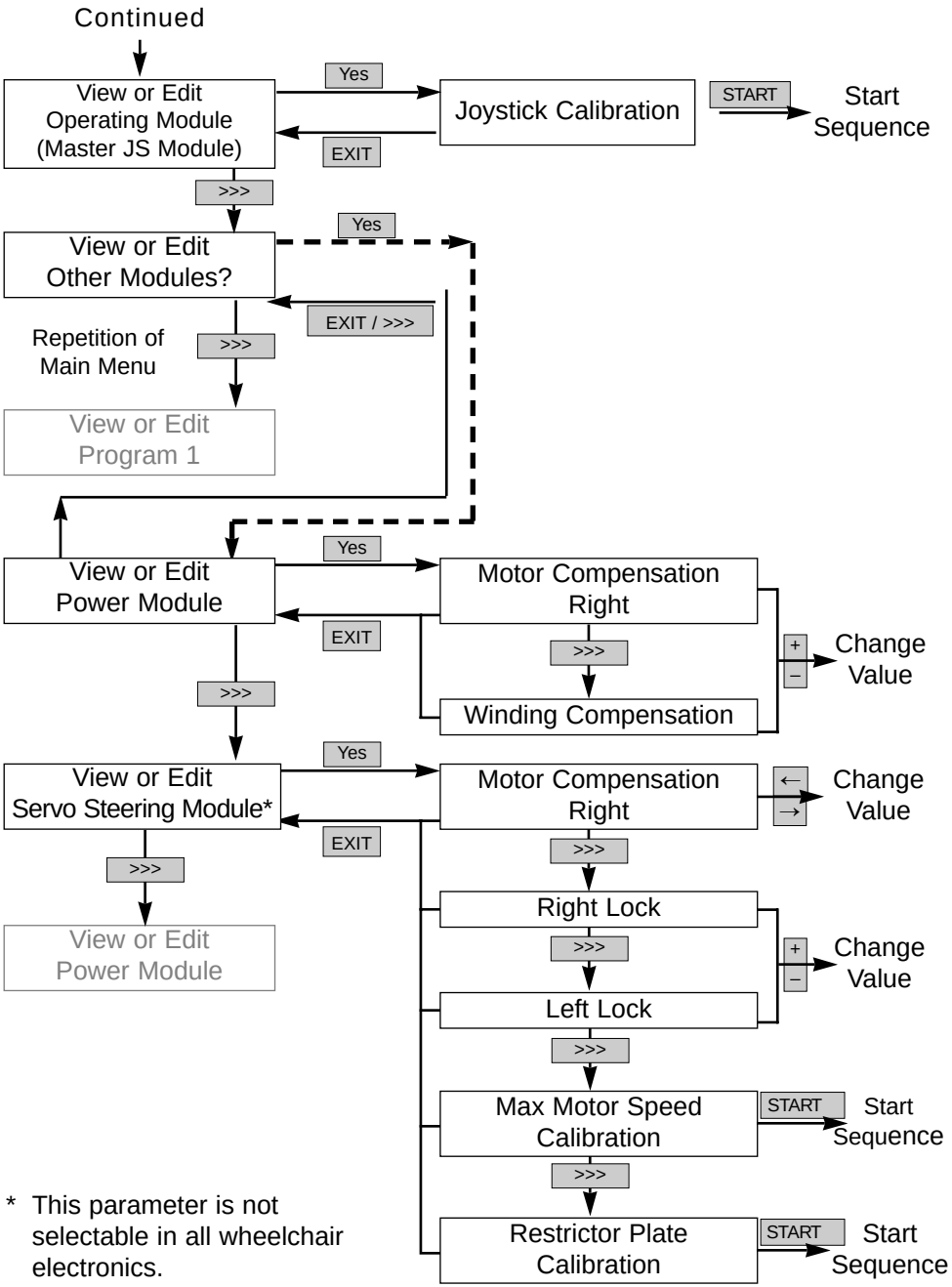
* This parameter is not selectable in all wheelchair electronics.

1.2 Technician Mode



NOTE:
Changing of the sequence in the technician mode is possible depending on the wheelchair electronics!

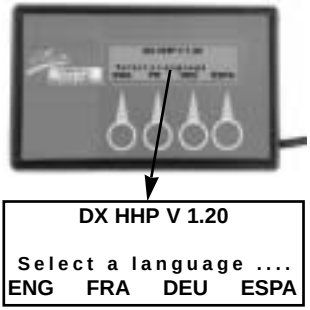
* This parameter does not appear in all wheelchair electronics.



* This parameter is not selectable in all wheelchair electronics.

2.0 Selecting a Language

Select a language:



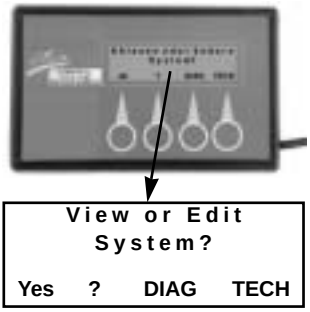
After the programmer is connected and the joystick box is switched on, the first that will appear will be the menu for selecting a language.

The following languages can be selected:

English = Selection key: ENG
French = Selection key: FR
German = Selection key: DEU
Spanish = Selection key: ESPA

3.0 Displays in the Main Menu

Main Menu Display:



After the language is selected, the main menu will appear in the display window.

The following functions can be selected via the keyboard:

YES = will switch into the menu for the adjustment of the parameters, which influence the wheelchair's driving behaviour.

? = not occupied

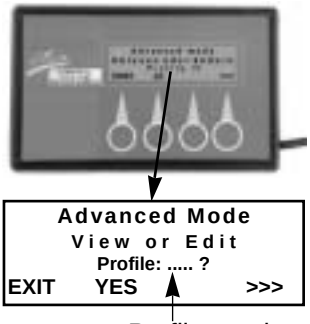
DIAG = serves to perform an error diagnosis

TECH = after entering an access code, will switch into the expanded sub-menu for the adjustment of the driving parameters.
Technician Mode

4.0 “YES” Menu

4.1 Profiles 1 - 5

“YES”-Menu : Profiles 1 - 5



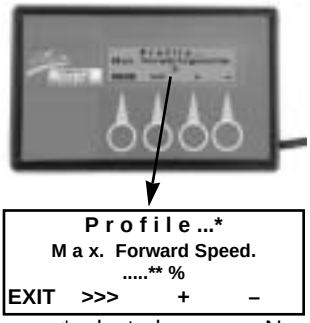
The profile number appearing in the “YES” menu corresponds to the respective drive mode of the joystick box.

Profile 1 = Drive mode 1
Profile 2 = Drive mode 2
Profile 3 = Drive mode 3
Profile 4 = Drive mode 4
Profile 5 = Drive mode 5

By selecting the “YES” commands, you will reach the sub-menu for the modification of the parameters of profiles 1 to 5 and the attendant profile.

4.1.1 Minimum* and maximum forward, reverse, and cornering speeds

Profiles 1 - 5: Maximum Speed



*selected program No.
**editable value

Designations:
forward speed = Vorwärtsgeschwindigkeit
reverse speed = Rückwärtsgeschwindigkeit
cornering speed = Drehgeschwindigkeit

This parameter allows a percentage regulation of the forward, reverse and cornering speeds at full deflection of the joystick.
For each individual profile (drive mode) a differently high speed can be entered (%-value).
The graduation is performed in 5%-steps.

Settings:
10 % = lowest speed
100 % = highest speed

* All minimum values are relevant for Compact joystick boxes only.
For REM 24 SC joystick boxes the lowest value must be selected.

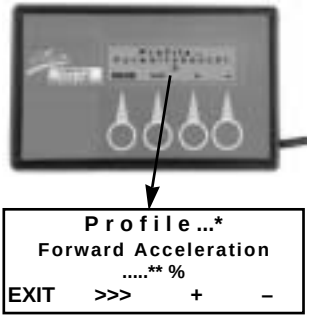
4.1.2 Forward, Reverse and Cornering Accelerations

This adjustment allows the percentage regulation of the forward, reverse and cornering accelerations.
The acceleration determines how fast the motor will reach the adjusted maximum speed at full deflection of the joystick.
For each single profile (driving mode) a differently high acceleration value (%-value) can be entered.
The graduation is performed in 5%-steps.

Adjustments:

10 % = lowest acceleteration
(slow response)
100 % = highest acceleration
(fast response)

Profiles 1 - 5: Acceleration



*selected program No.
**editable value

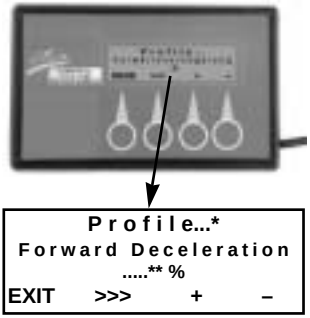
4.1.3 Forward, reverse and cornering deceleration

This parameter allows the percentage regulation of the forward, reverse and cornering decelerations.
The decelerlation determines how fast the motor will slow down to a standstill, after the joystick is brought into the neutral position = central position.
For each single profile (driving mode) different deceleration values (%-values) can be entered.
The graduation is performed in 5%-steps.

Adjustments:

10 % = lowest deceleration
(slow speed reduction)
100 % = highest deceleration
(fast speed reduction)

Profiles 1 - 5: Deceleration



*selected program No.
**editable value

4.1.4 Grip

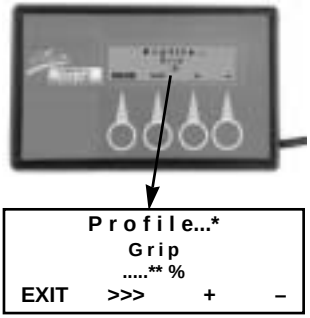
The adjustment of the grip will stabilise the driving behaviour of the wheelchair when entering and accelerating in curves.

For each individual driving mode a different grip value can be entered.

The graduation is performed in 5%-steps.

Settings:
20 % = lowest setting
100 % = highest setting

Profiles 1 - 5: Grip



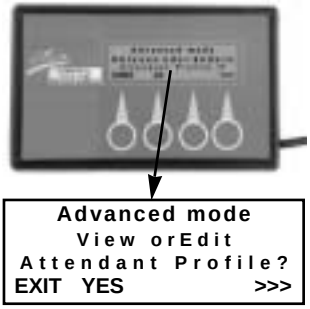
*selected program No.
**editable value

4.2 “YES” Menu: Attendant Profile

The menu item ”Attendant Profile“ appearing in the ”YES-Menu” serves to program an additionally mounted joystick box, such as a connectable joystick box for attendants.

By selecting the “YES” instructions, you will reach the sub-menu for the modification of the parameters.
The properties of the parameters to be modified are described in sections 4.1.1 - 4.1.4 .

“YES” Menue: Attendant Profil



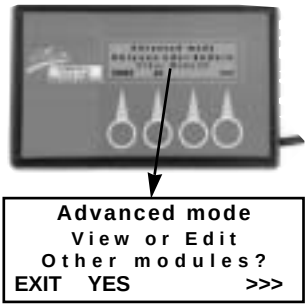
NOTE:
“Attendant Profile” is not selectable in all wheelchair electronics.

4.3 “YES”Menu: Other modules

The menu option “Other modules“ is not selectable in all wheelchair electronics. For programming this option, the technician mode must be switched on.

NOTE:
For programming this option, the technician mode must be switched on.

“YES” Menu: Other Modules

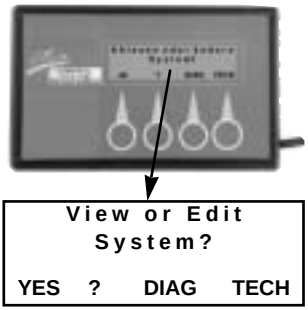


5.0 “TECH” Menu (Technician Mode)

The technician mode (TECH), which can be selected from the programmer’s main menu, allows further interventions into the ACS control’s driving modes.

The parameters of the technician mode are protected and can only be reached by entering the access code.

Technician Mode



NOTE:
Once the programmer’s plug connection is interrupted, the technician mode will be automatically saved again.

CAUTION: Danger of Accident!

- *Interventions into the technician mode’s parameters are to be performed only after getting thoroughly acquainted with these operating instructions.*
- *After each modification, the driving safety must always be checked by means of a test drive.*

5.1 Entering the Code

By activating the "TECH"-key you will reach the level, where the technician code is entered.

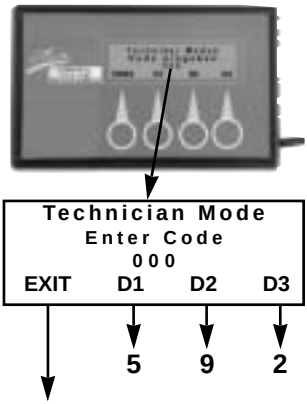
The access code for the technician mode is:

*** 5 * 9 * 2 ***

Entering Sequence:

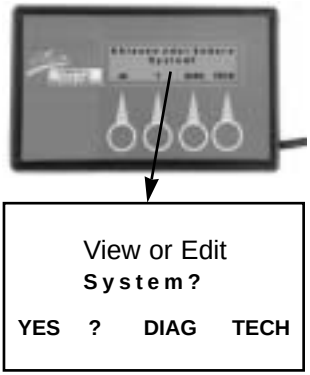
5 x D1 * 9 x D2 * 2 x D3 plus EXIT.

“TECH” Menu:
Enter the Code



After the input is terminated, the main menu will be displayed again.
After activating the ”YES” key, the parameters described in section 4.0 (“YES” menu) can be adjusted.
In addition, the parameters described starting section 5.2 “YES-Menu in the Technician Mode” are selectable and editable.

Display of Main Menu:



NOTE:
The technician mode can be exited only after disconnecting the programmer’s plug connection.

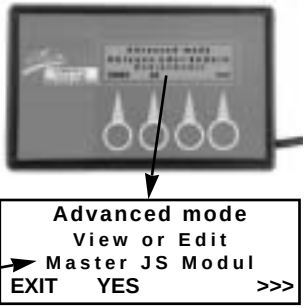
5.2 “YES” Menu in the Technician Mode: Operating Module (Master JS Module)

The term control module appearing in the “YES”-Menu allows an intervention into the settings of the joystick box.

By selecting the “YES” commands you will reach the sub-menu for the modification of the following parameters.

or “operating module”, depending on the electronics

“YES”-Menu: Control Module



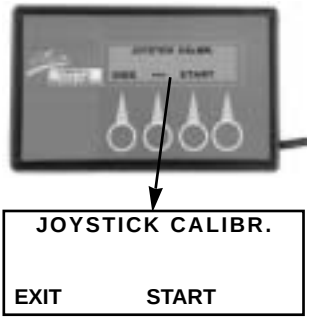
5.2.1 Joystick Calibration

When calibrating the joystick, the positions of the joystick’s driving directions are programmed into the electronics.

The calibration is only required after a replacement of the joystick.

By selecting the “START” commands you will reach the sub-menu for the calibration of the joystick.

Control Module: Joystick Calibration



Sequence of Commands:

Rotate joystick	=	to move the joystick along the restrictor plate in a rotating way
Neutral	=	Guide joystick into the central (neutral) position
STOP	=	Save sequence by pressing down the STOP key.
EXIT	=	Causes the termination of the option without saving.

Restrictor Plate = mechanical restrictions of the joystick movements

Sub-Menu:

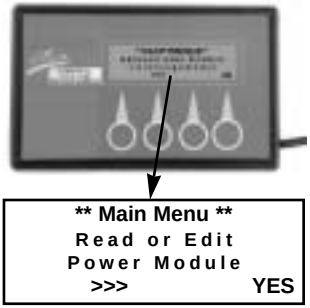
Rotating the Joyjstick:

5.3 The “YES”Menu in Technician Mode: Power Module

The term power module appearing under "other modules" in the technician mode, allows the intervention into the electronics of the main module.

By selecting the “YES” commands you will reach the sub-menu for the modification of the following parameters.

“YES” Menu: Power Module



5.3.1 Motor Compensation

This parameter allows the percentage adaptation of the synchronization of the right and left motors.

Only if both motors are synchronized, an exact directional stability of the power wheelchair can be guaranteed.

An adjustment of this parameter may become necessary, for instance, after the replacement of a driving motor.

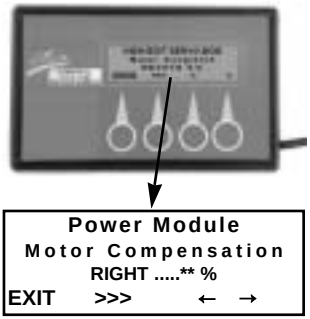
The graduation is performed in 1%-steps.

Settings:

← = slowing down left motor

→ = slowing down right motor

Performance Module: Motor Compensation



**editable value

5.3.2 Winding Compensation

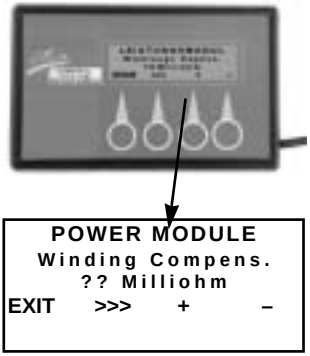
This parameter is necessary for matching the electronics to the different types of motors. The value is preset by the factory and may not be modified by any means.

Setting Values and Driving Properties:

Value too low = steering movements not precise

Value too high = jerking driving movements jerking, unprecise steering movements

Power Module: Winding Compensation



CAUTION: Danger of Accident

An incorrect setting leads to uncontrollable driving movements.

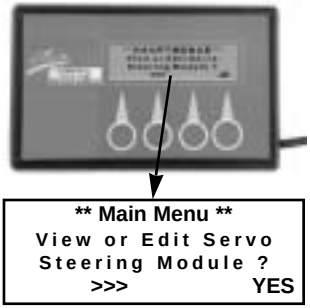
Do NOT modify the setting!

5.4 “YES”Menu in the Technician Mode: Servo Steering Module

The definition Servo Steering Module appearing in the technician mode under "Other Modules" allows an intervention into the electronics of the servo/lighting module.

By selecting the “YES” command, you will open the sub-menu for modifying the following parameters.

“YES”Menu: Servo Steering Module



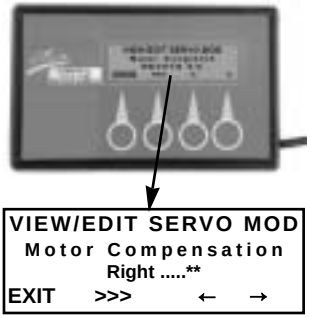
NOTE:
This parameter is only editable in power wheelchairs that are provided with a servo steering motor.

5.4.1 Motor Compensation

This parameter allows the adjustment of the directional position of the servo steering motor.

The adjustment of this parameter can become necessary, for example, following the replacement of a servo steering motor.

Servo Steering Module: Motor Compensation



**editable valuet

Settings:

← = adjusting motor to the left
graduation 0 - 128 left (left correction)

→ = adjusting motor to the right
graduation: 0 - 128 right
(right correction)

Standard setting = RIGHT 0 %

NOTE:
Due to the small graduation steps, a very precise adjustment of the directional stability is made possible. A visible change is hard to detect, that is why the wheels must be carefully observed.

5.4.2 Right Lock

This parameter allows the adjustment of the maximum right steering deflection.

The graduation is performed in 1%-steps

CAUTION: Danger of Accident
The activation of this setting makes the wheels turn automatically inward.

Settings:

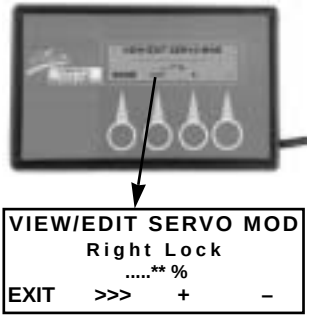
+ = deflection closer to the mechanical steering lock
– = deflection farther away from the mechanical steering lock

Default setting = RIGHT 79 %

Adjusting measure:
Air gap of 1 mm to the mechanical steering lock at maximum steering deflection.

NOTE:
If the lever of the servo steering motor touches the mechanical lock, it can lead to its destruction.

Servo Steering Module: Right Lock



**editable value

5.4.3 Left Lock

This parameter allows the adjustment of the maximum left steering deflection.

The graduation is performed in 1%-steps.

CAUTION: Danger of Accident
The activation of this setting makes the wheels turn automatically inward.

Settings:

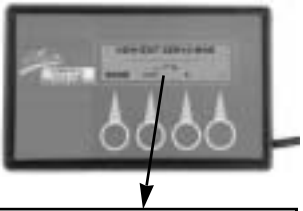
+ = deflection closer to the mechanic steering lock
– = deflection farther away from the mechanic steering lock

Default setting = LEFT 25 %

Adjusting measure:
Air gap of 1 mm to the mechanic steering locks at maximum steering deflection.

NOTE:
If the lever of the servo steering motor comes into touch with the mechanic steering lock, it can lead to its destruction.

Servo Steering Module: Left Lock



VIEW/EDIT SERVO MOD			
Left Lock			
.....** %			
EXIT	>>>	+	–

**editable valuet

5.4.4 Maximum Motor Speed Calibration

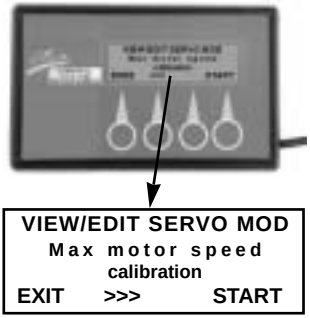
This parameter performs the adjustment of the electronics to the servo steering motor's maximum obtainable steering speed.

The adjustment takes place automatically after the function is activated (START).
It is done at the factory and no adjustment is required.

CAUTION: Danger of Accident
The activation of this adjustment makes the wheels turn automatically inward.

Setting:
Should a calibration be necessary, the power wheelchair concerned must be subjected to a test load.
Test load = 140 kg

Servo Steering Module: Max motor speed calibration



5.4.5 Restrictor Plate Calibration

This parameter adapts the servo steering motor to the joystick restrictor plate. This causes the servo steering motor to turn the maximum joystick deflection to the right and to the left exactly into the maximum steering movement.
The adjustment is performed at the factory and no further adjustment is necessary.

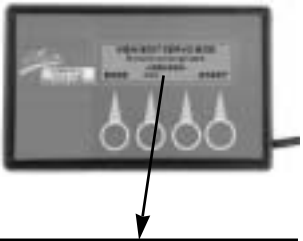
By selecting the “START” command you will open the sub-menu for the calibration of the joystick.

Sequence of commands:

Trace Joystick = Move the joystick along the restrictor plate in a rotating motion.
SAVE = Save the sequence by pressing the SAVE key
EXIT = Causes the cancellation of the option without saving.

***Restrictor Plate =** mechanical limitation of the the joystick movements

Servo Steering Module: Restrictor Plate



Sub-Menu

Trace Joystick: (Rotate Joystick)

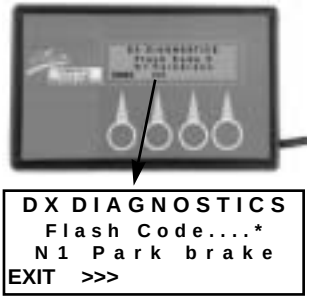
6.0 “DIAG” = Error Diagnosis

The DIAG key appearing in the main menu allows the performance of a diagnosis of the entire ACS-system.
In the presence of a malfunction in the system, the number of the error will be displayed.
The error number shown corresponds to the error code of the joystick box.

Example:
Error number 1 = flash code 1 x flashing

You will find a list of error codes in the annex.

“DIAG” = Error Test



*Error Number

7.0 Operation

The sequence and the display language of the described programming steps depend on the electronics of the power wheelchair.
Example:
Master JS Module (G40) = Operating module (STORM)

Should a desired programming parameter not appear at the position shown, you will reach it by “scrolling” [>>>] the sequence menu.

7.1 Function of the Key Symbols

EXIT = Serves to save a sequence while simultaneously returning to an upper menu.

>>> = Scrolling the menu items.

YES = Switches from the main menu to a sub-menu.

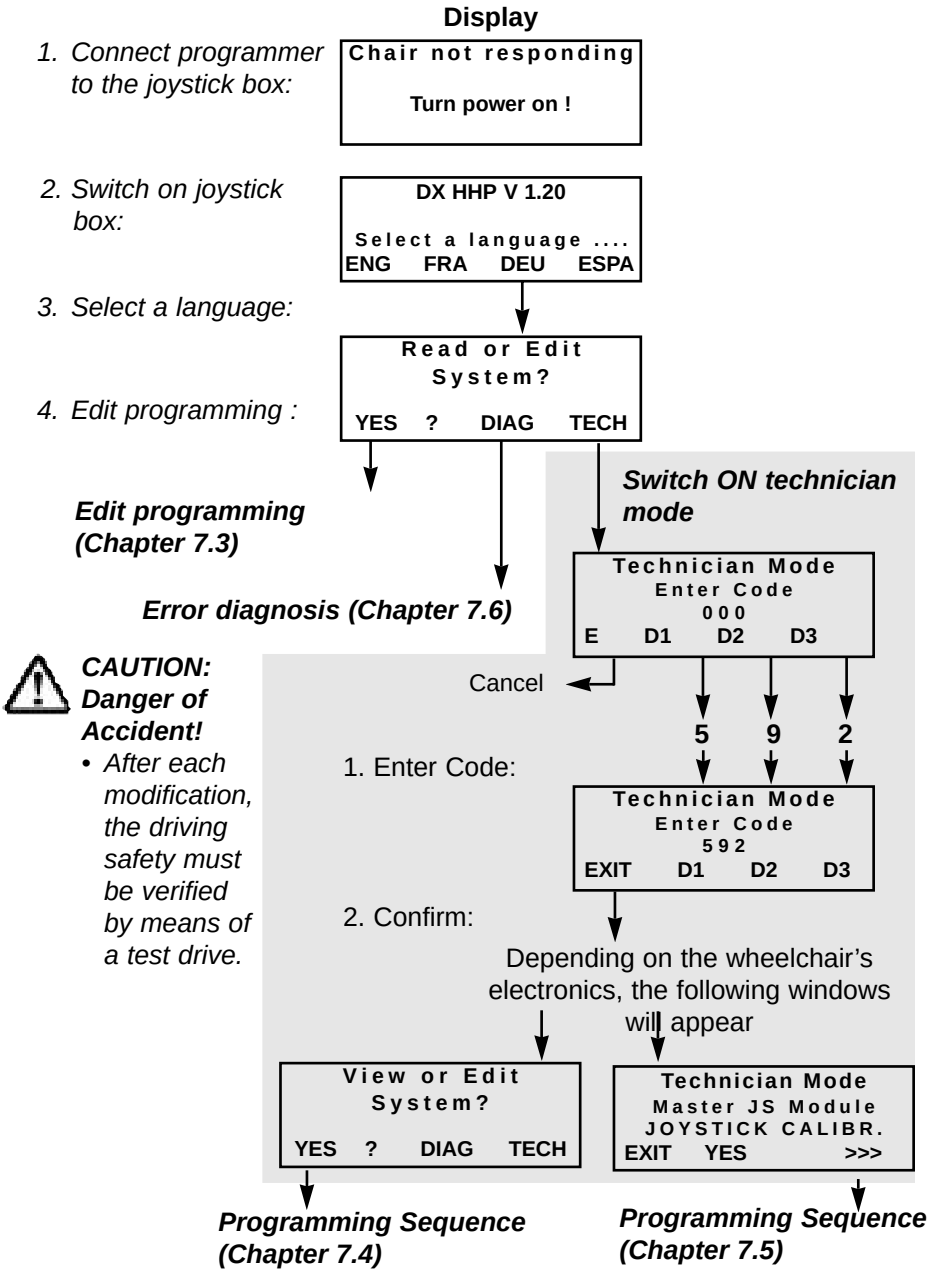
\+ – = Increases (+) / decreases (–) the setting value.

← → = Changes direction-related adjustment values.
Adjustment direction to the left (←)/ to the right (→)

START = Starts a sub-menu providing calibration and triggering or requiring movements.

STOP = Serves to save a sequence while simultaneously terminating the programming sequence.

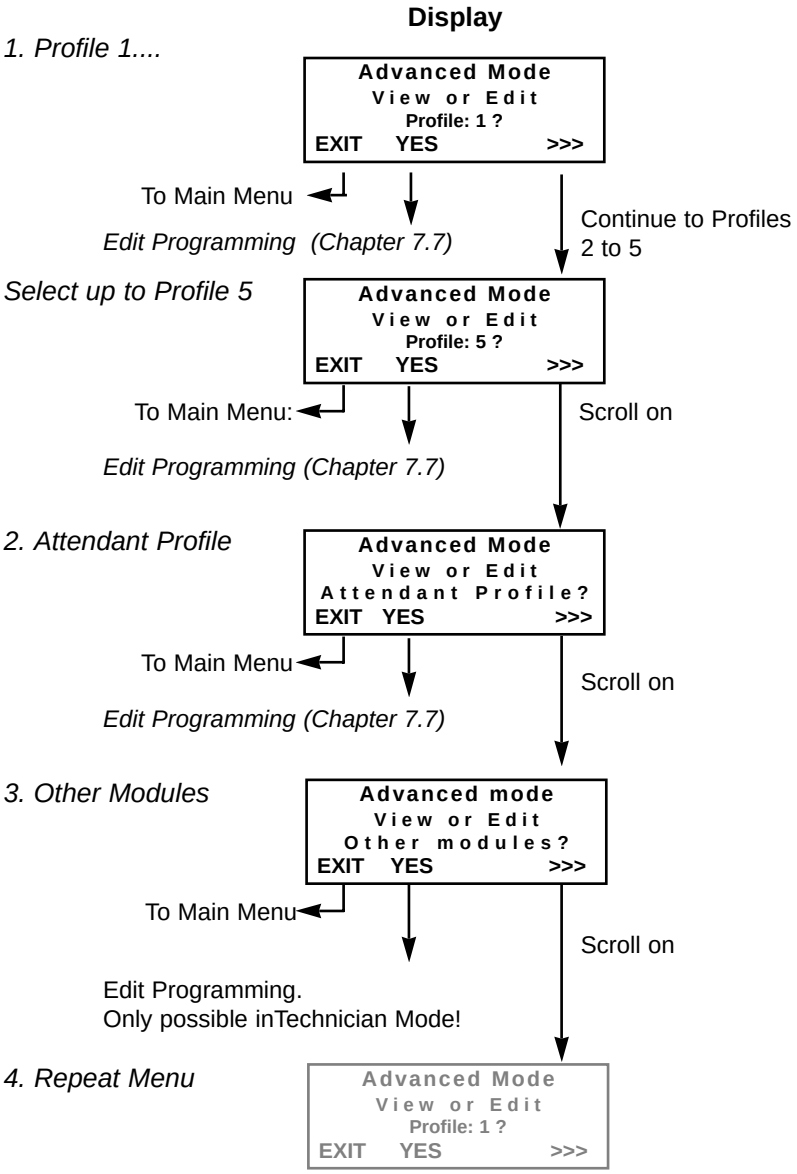
7.2 Operations in the Main Menu



CAUTION: Danger of Accident!

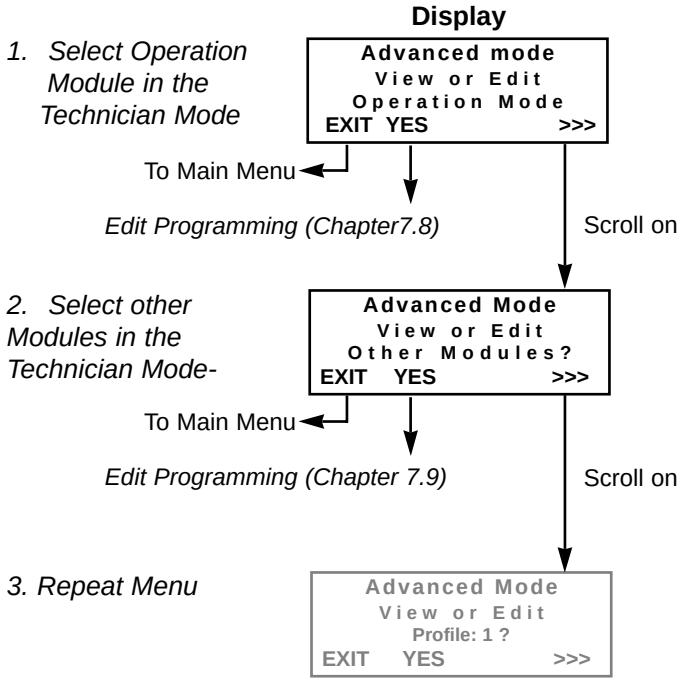
- *After each modification, the driving safety must be verified by means of a test drive.*

7.3 Operation in the “YES” Menu



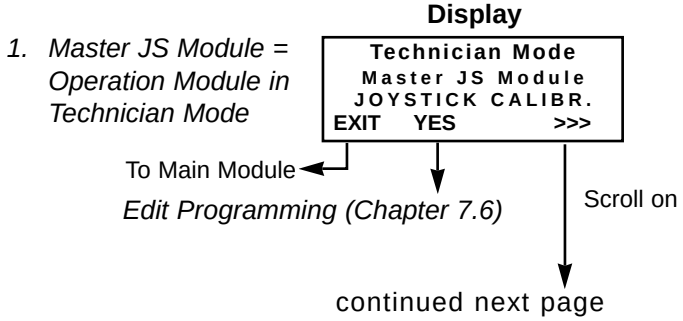
7.4 Technician Mode: Sequence 1

The following program points can only be selected when the technician mode is switched on *(Chapter 7.2, Switch ON technician mode*!)



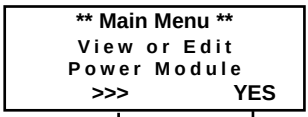
7.5 Technician Mode: Sequence 2

The following program points can only be selected when the technician mode is switched on *(Chapter 7.2, Switch Technician Mode ON)*!



Continuation:

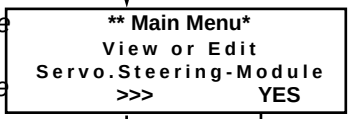
2. *The Power Module in the Technician Mode*



Scroll on

Edit Programming (Chapter 7.9)

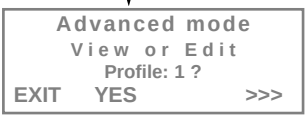
3. *Servo Steering Module = Servo Steering in the Technician Mode*



Scroll on

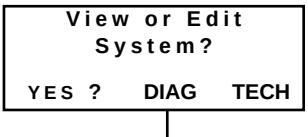
Edit Programming (Chapter 7.10)

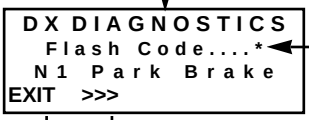
4. *Repeat Menu*



7.6 Error Diagnosis: “DIAG” Menu

1.Activate Test



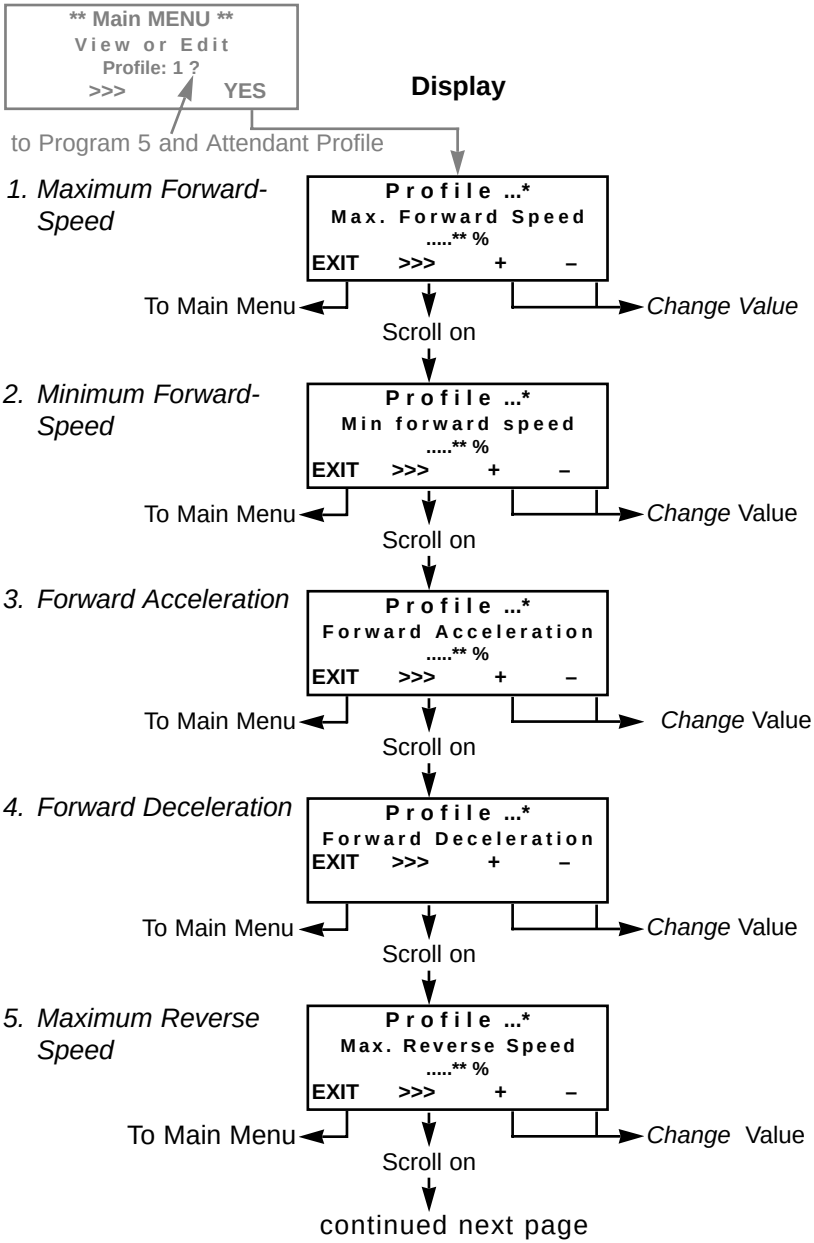


No. of Error Code. Error Code List in the Annex

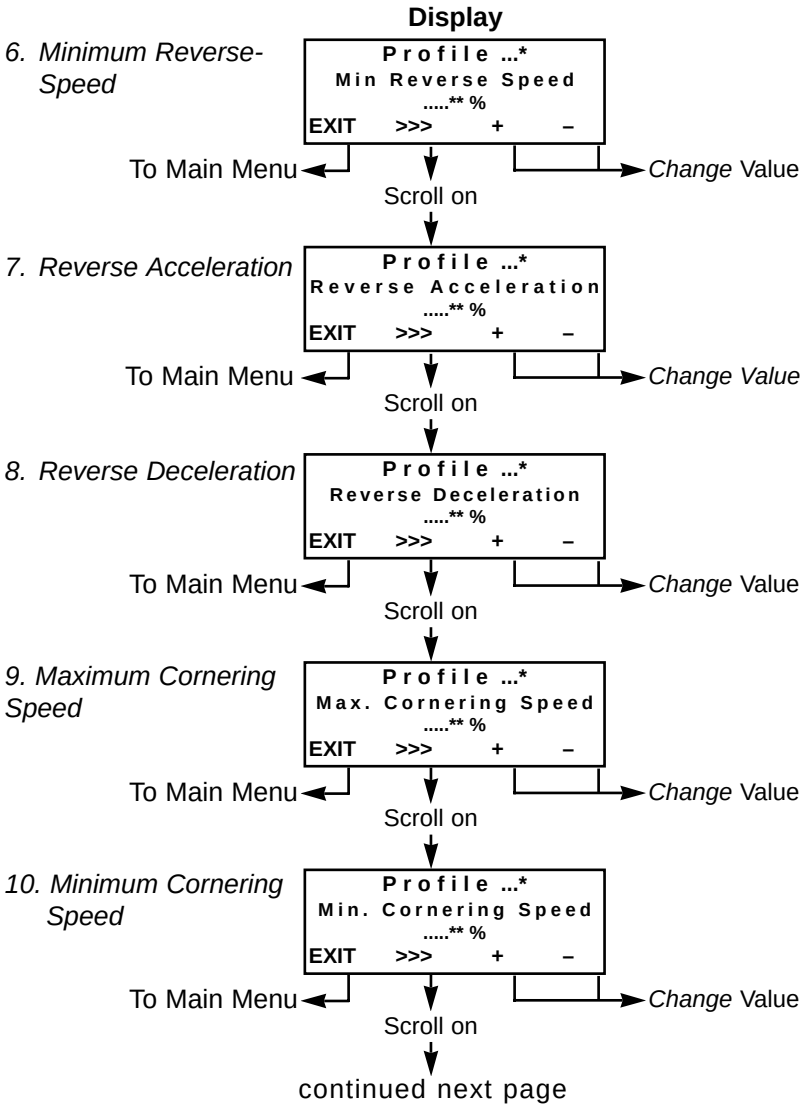
To Main Menu

Scroll On

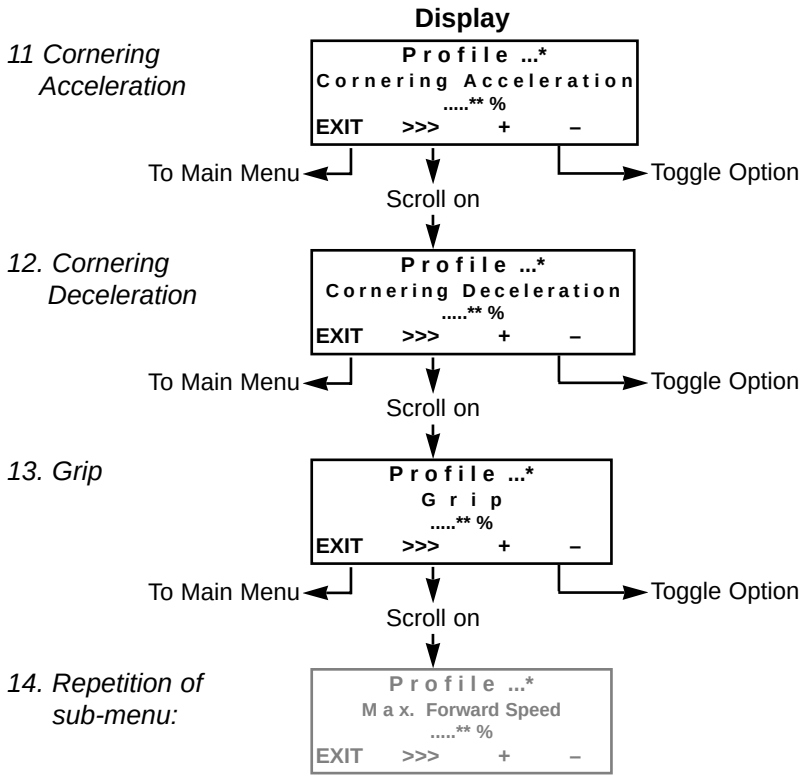
7.7 Edit Programming: Profiles 1 - 5 / Attendant Profile



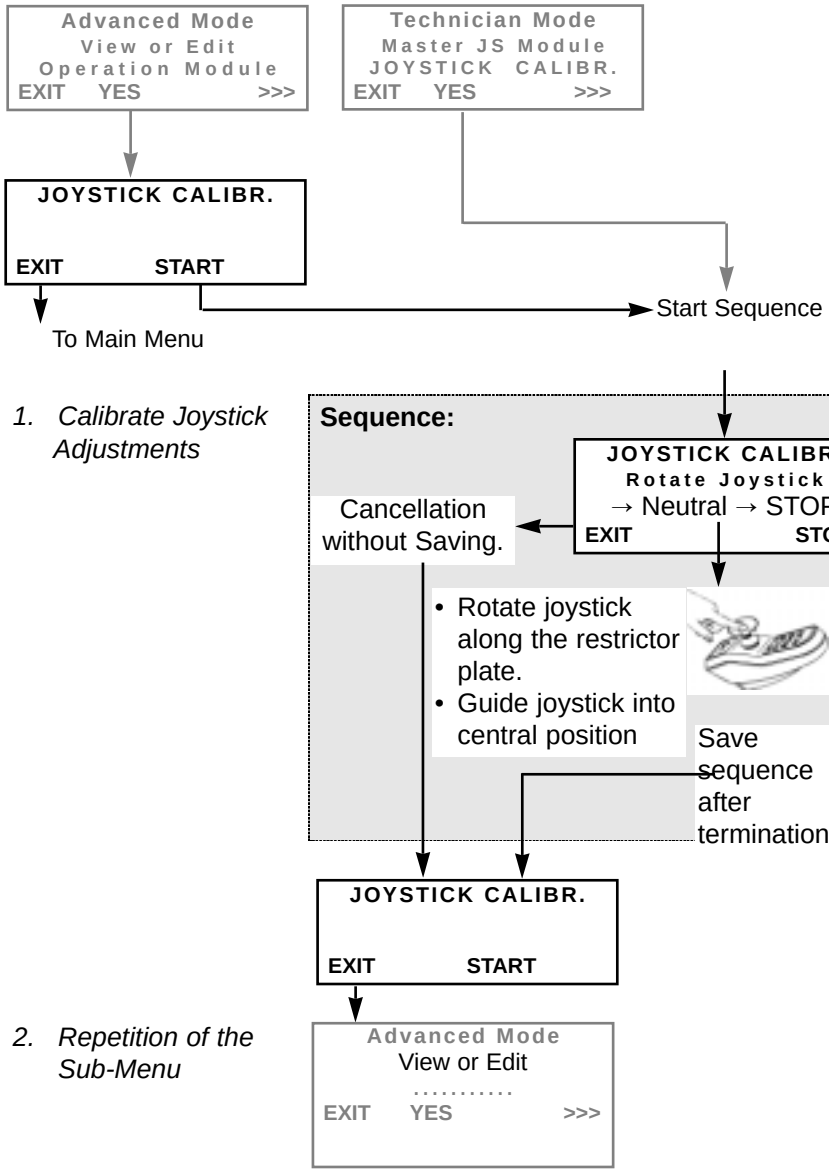
C o n t i n u a t i o n :



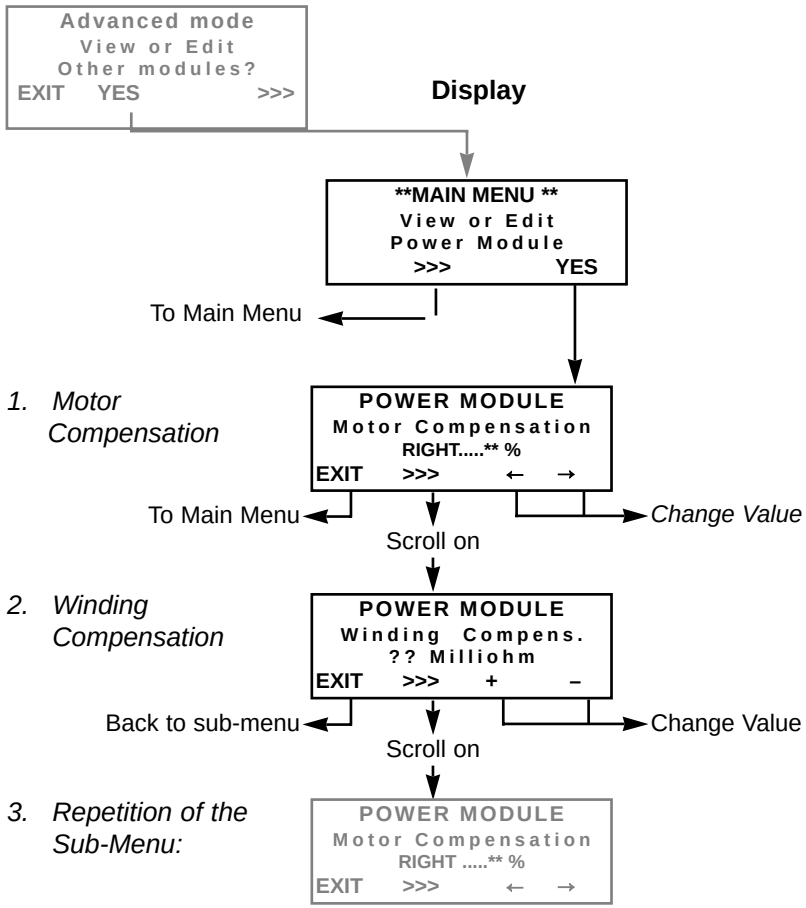
C o n t i n u a t i o n :



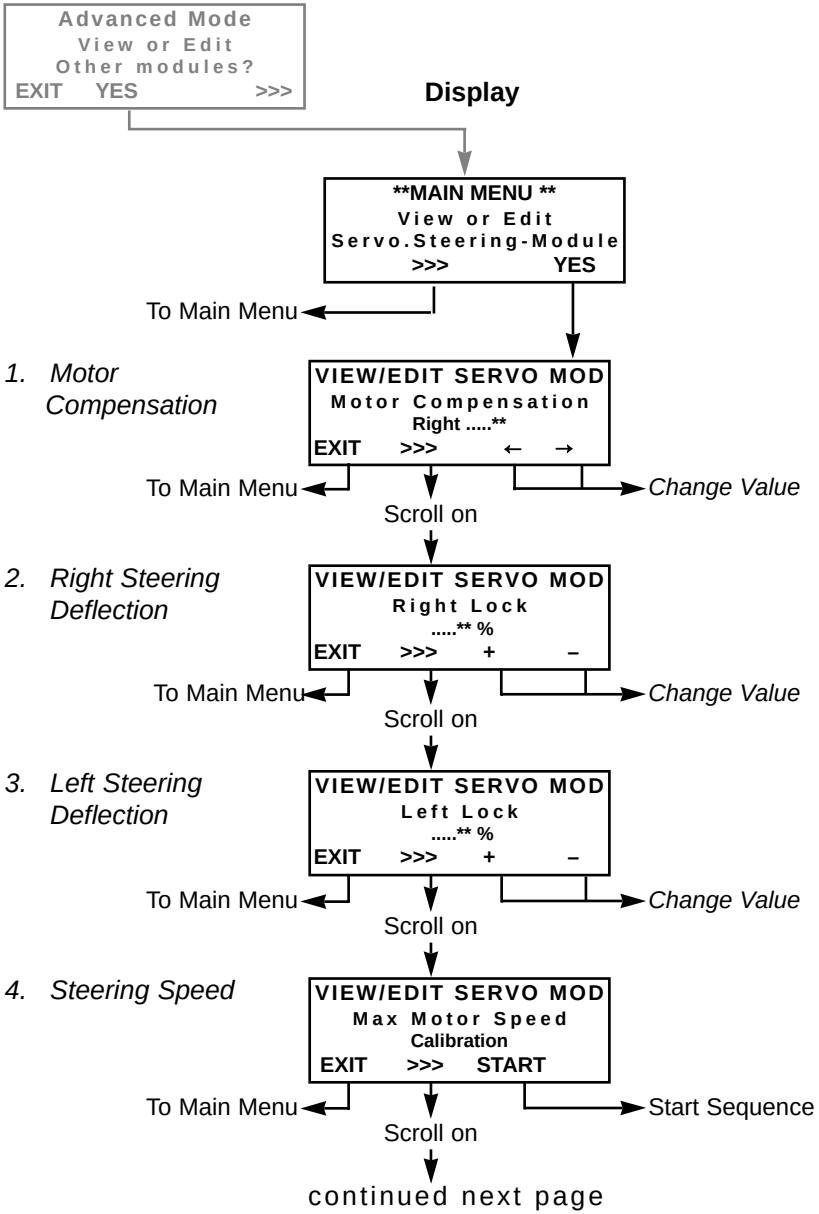
7.8 Edit Programming (Technician Mode): "Operation Module (Master JS Modul)"



7.9 Edit Programming (Technician Mode): "Other Modules - Power Module"



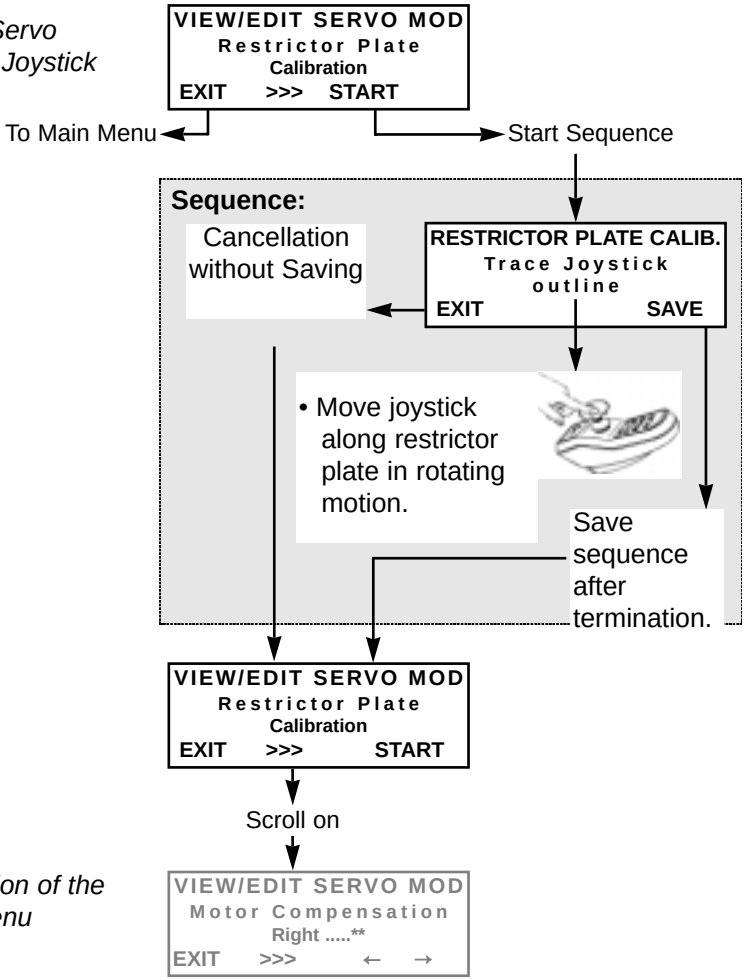
7.10 Edit Programming (Technician Mode): "Other Modules - Servo Steering Module"



C o n t i n u a t i o n :

Display

5. Adapt Servo Steering to Joystick



6. Repetition of the Sub-Menu

PART B

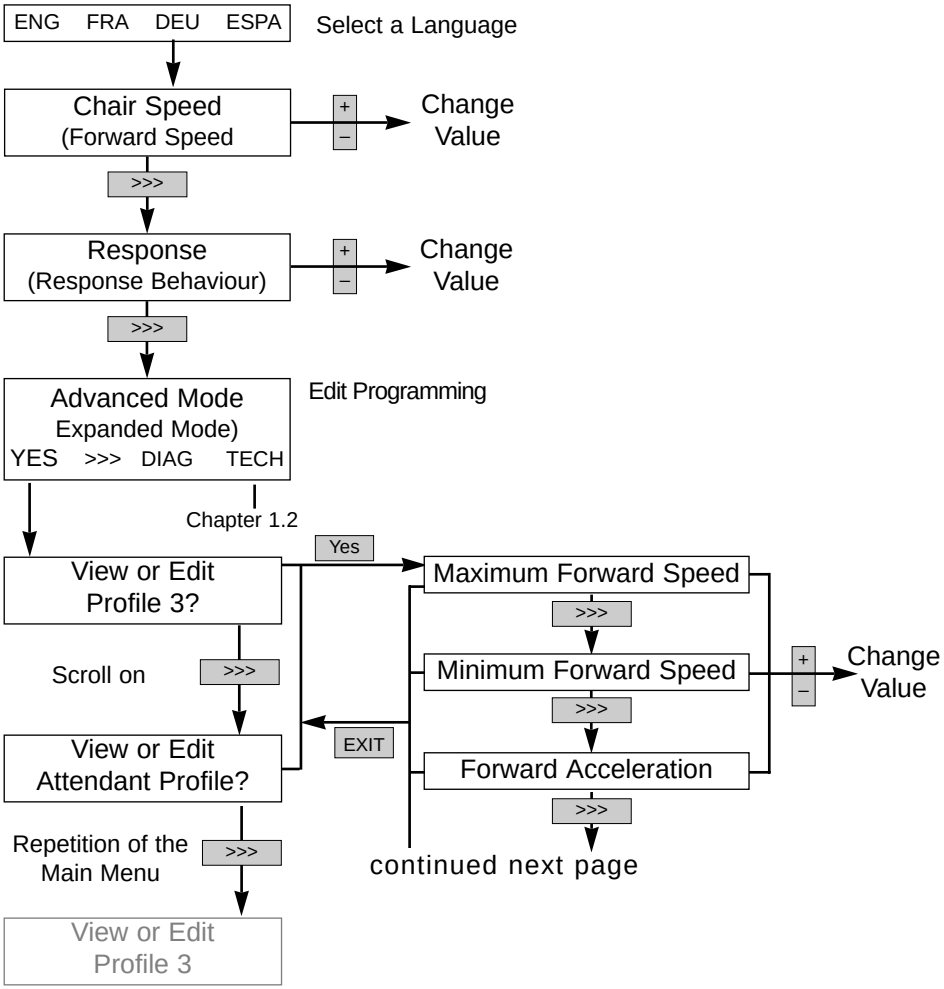
Pogramming of ACS Compact Joystick Boxes

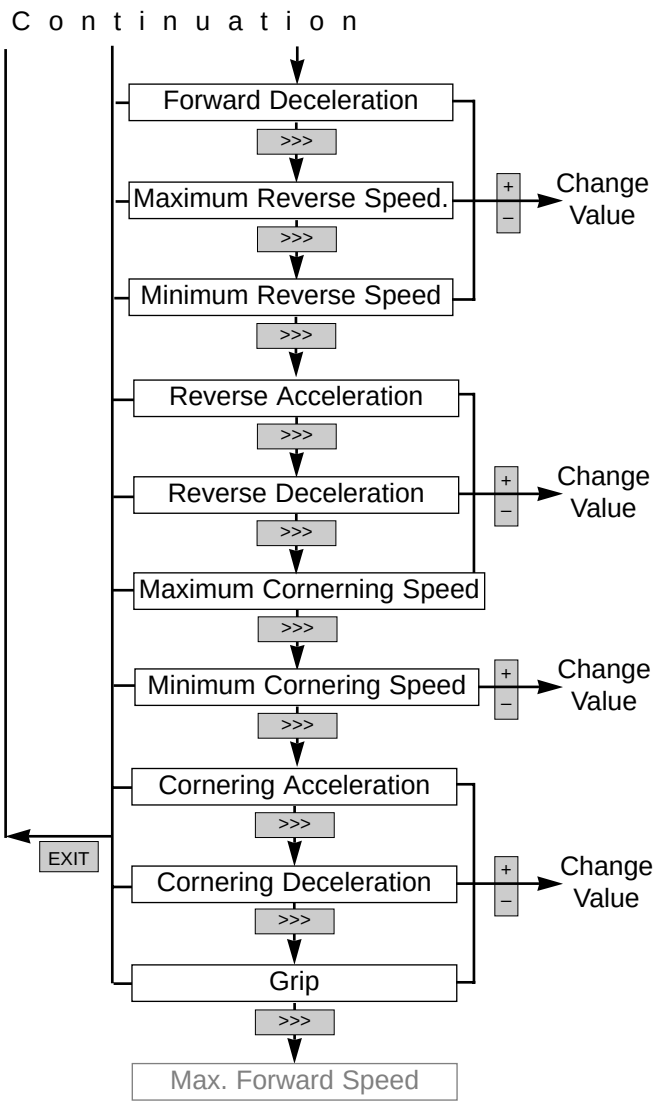
Table of Contents:

1.0 Brief Instructions - ACS Compact Joystick Boxes

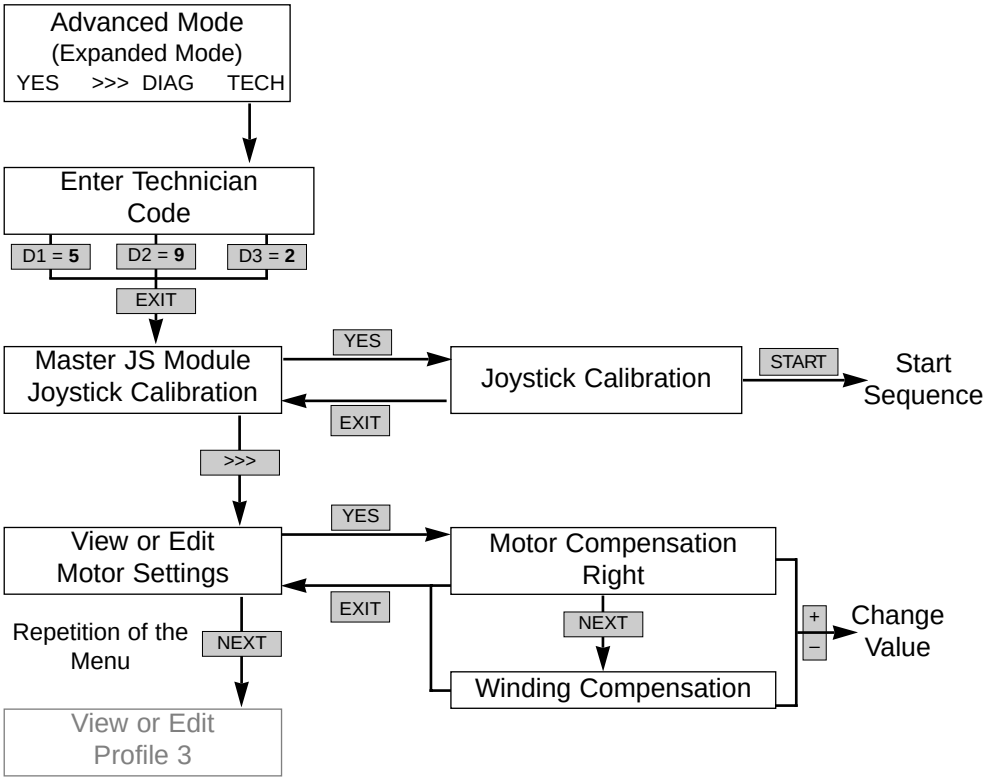
The following brief instructions shall give you a general idea of the programming steps. It is imperative, however, to pay due attention to the detailed instructions contained in chapter “Operation”.
The sequence and display of the described programming parameters may differ according to the electronics of the wheelchair

1.1 Standard Programming



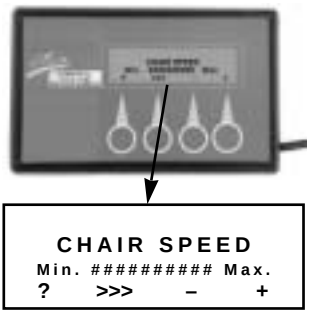

C o n t i n u a t i o n
Forward Deceleration
>>>
Maximum Reverse Speed.
>>>
Minimum Reverse Speed
>>>
Reverse Acceleration
>>>
Reverse Deceleration
>>>
Maximum Cornerning Speed
>>>
Minimum Cornering Speed
>>>
Cornering Acceleration
>>>
Cornering Deceleration
>>>
Grip
>>>
Max. Forward Speed
EXIT
+
–
Change Value
+
–
Change Value
+
–
Change Value
+
–
Change Value

1.2 Technician Mode



2.0 CHAIR SPEED - Maximum Speed

CHAIR SPEED



This parameter allows the regulation of the speed at full deflection of the joystick. This influences the forward, reverse and cornering speeds.

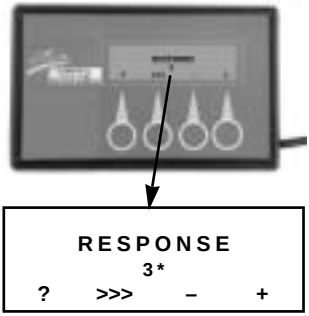
The number of #-symbols determines the speed selected.

Settings:

1 # -symbol = lowest speed
10 # -symbols = highest speed

3.0 RESPONSE - Driving Behaviour

RESPONSE



*editable value

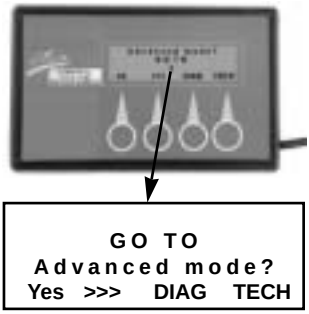
This parameter allows the basic setting of the wheelchair's driving behaviour. By changing the parameters described in paragraph 5.0, a fine adjustment of the driving behaviour can be performed.
The graduation is performed in 5 steps.

Settings:

5 = fast driving behaviour
1 = slow driving behaviour

4.0 Advanced Mode - expanded mode

Advanced Mode (Expanded Mode)



The advanced mode allows the adjustment of individual parameters, which influence the wheelchair's driving behaviour.

The following functions can be selected by means of the keyboard:

YES = switches into the menu for the adjustment of the driving parameters.

>>> = switches to the next menu point

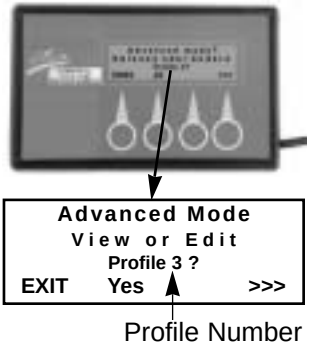
DIAG = serves to perform an error diagnosis

TECH = after entering an access code, switches into the expanded sub-menu for the adjustment of the driving parameters. **Technician Mode.**

5.0 "Advanced Mode" Menu

5.1 Profile 3

"Advanced Mode" Menu: Profile 3



The profile number 3 appearing in the "Advanced Mode" menu corresponds to the response setting of the joystick box.

By selecting the "YES" command you will open the sub-menu for editing the driving parameters..

5.1.1 Minimum and Maximum Forward, Reverse and Cornering Speeds (Forward, Reverse and Cornering Speeds)

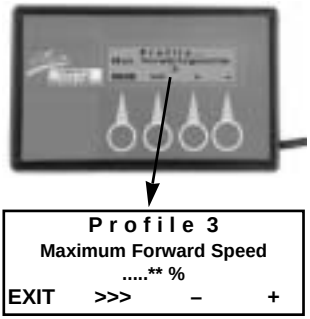
Designations:
forward speed
reverse speed
cornering speed

This parameter provides the percentage regulation of the forward, reverse and cornering speeds at full deflection of the joystick.

The graduation is performed in 5%-steps.

Settings:
10 % = lowest speed
100 % = highest speed

Profile 3: Maximum Speed



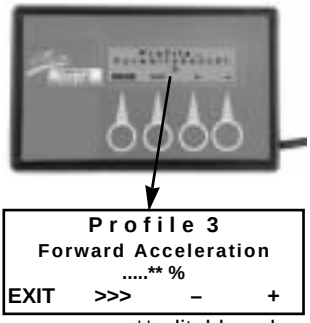
**editable value

5.1.2 Forward, Reverse and Cornering Accelerations

This setting allows the regulation of the forward, reverse and cornering accelerations. The acceleration determines how fast the motor will reach the adjusted maximum speed at full deflection of the joystick.
To each single profile (driving mode) a differently high acceleration value (%-value) can be assigned.
The graduation is performed in 5%-steps.

Settings:
10 % = lowest acceleration (slow reaction)
100 % = highest acceleration (quick reaction)

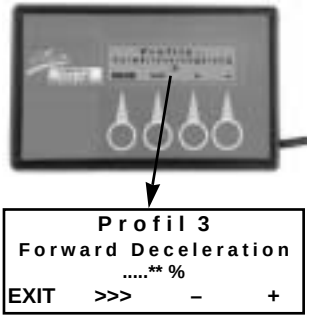
Profile 3: Acceleration



**editable value

5.1.3 Foreward, Reverse and Cornering Decelerations

Profile 3: Deceleration



**editable value

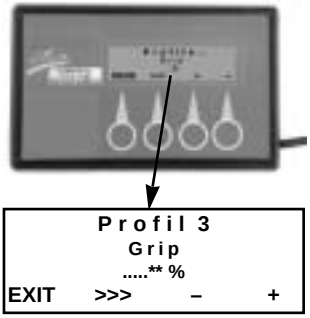
This parameter provides the percentage regulation of the forward, reverse and cornering decelerations.
The deceleration determines how fast the motor will slow down to the point of coming to a standstill, after the joystick has been brought into the neutral position = central position.
To each single profile (driving mode) different decerlation values (%-value) can be assigned.
The deceleration can be performed in 5%-steps.

Settings:

10 % = lowest deceleration (slow braking)
100 % = highest deceleration (fast braking)

5.1.4 Grip

Profile 3: Grip



**editable value

The adjustment of the grip stabilises the driving behaviour of the wheelchair when turning and accelerating in curves.

To each single driving mode a differently high grip value can be assigned.

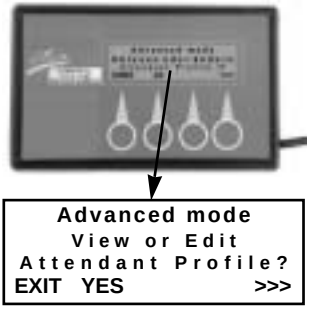
The graduation is performed in 5%-steps.

Settings:

20 % = lowest setting
100 % = highest setting

5.2 “Advanced Mode” Menu: Attendant Profile

“Advanced Mode”: Attendant Profile

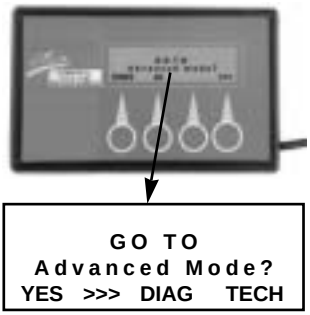


The menu point ”Attendant Profile“ appearing in the ”Advanced Mode” Menu serves to program an additonally mounted joystick box, such as the connectable joystick box for attendants.

By selecting the “YES” command you will reach the sub-menu for editing the driving parameters.
The properties of the parameters to be edited are described in paragraphs 5.1.1 - 5.1.4.

6.0 “TECH” Menu (Technician Mode)

Technician Mode



The technician mode (TECH) selectable in the “advanced mode” display of the programmer allows further interventions into the ACS-control’s driving parameters.

The parameters of the technician mode are protected and can only be reached by entering the access code.

NOTE:
After separating the programmer’s plug connection, the technician mode will automatically be saved again.

ATTENTION: Danger of Accident!

- *Any interventions into the technician code should only be performed after getting thoroughly acquainted with the present operating instructions..*
- *It is imperative to verify the driving safety after each modification by means of a test drive.*

6.1 Enter Code

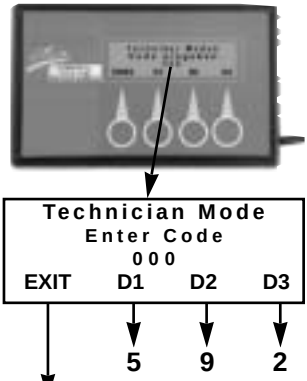
By activating the "TECH" key you will reach the level for entering the technician code.

The access code is:

*** 5 * 9 * 2 ***

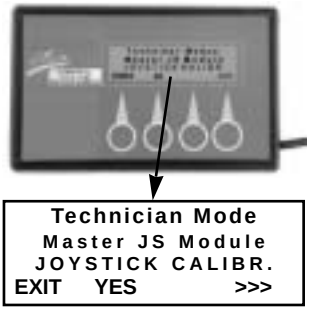
Input Sequence:
5 x D1 * 9 x D2 * 2 x D3 and confirm with EXIT
.

“TECH” Menu: Enter Code



After confirming with the “EXIT” key, the parameters described in paragraph 5.0 (“Attendant Profile” menu) can be edited. Additionally selectable and editable are the parameters described in the “YES/TECH” menu from paragraph 6.2 on.

“Technician Mode”- Master JS Module



NOTE:
You can exit from the technician mode only by separating the plug connection of the programmer.

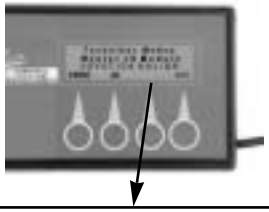
6.2 Technician Mode:

Master JS Module (Operating Module)

The term Master JS Module (operating module) appearing in the “YES” menu allows an intervention into the settings of the joystick box.

By selecting the “YES”command you will reach the sub-menu for the calibration of the joystick.

Master JS Module (Operation Module)



```
Technician Mode
Master JS Module
JOYSTICK C ALIBR.
EXIT    YES          >>>
```

6.2.1 Joystick Calibration

During the calibration of the joystick the adjustments of the joystick’s driving directions are programmed into the electronics.
The calibration is only necesary after the replacement of the joystick.

Sub-Menu: Joystick Calibration

```
JOYSTICK CALIBR.
Rotate Joystick
→ Neutral → STOP
EXIT          STOP
```

Sequence of Commands:

Rotate Joystick	=	Move joystick along the restrictor plate in rotating motions.
Neutral	=	Guide joystick into the central position (neutral)
STOP		After termination, save/ confirm sequence by pressing down STOP key.
EXIT	=	Causes the cancellation of the option without saving.

Rotate Joystick:

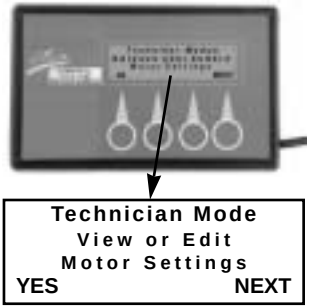
Restrictor Plate = mechanical restriction of the joystick movements

6.3 Technician Mode: Motor Settings

The "Motor Settings" in the technician mode allow an intervention into the electronics of the-main module.

By selecting the “YES” command you will reach the sub-menu for editing the following parameters.

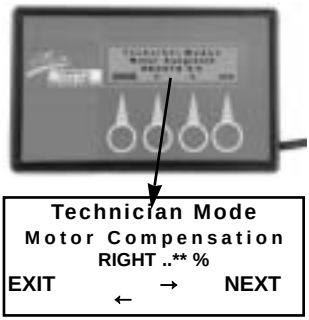
Motor Settings



6.3.1 Motor Compensation

This parameter allows the percentage synchronization of the right and the left motor. Only when both motors run in the same direction, an exact directional stability of the wheelchair can be guaranteed.
The adjustment of this parameter can become necessary, for example, after the replacement of a drive motor.
The graduation is performed in 1%-steps.

Motor Compensation



**editable value

Settings:

← = slow down left motor
→ = slow down right motor

Standard Setting = RIGHT 0 %

6.3.2 Winding Compensation

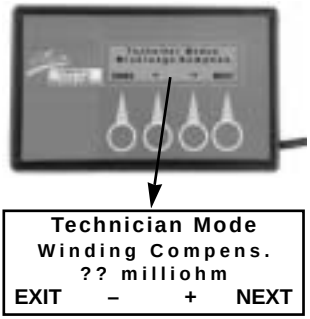
This parameter is necessary for adapting the electronics to the different types of motors. The value is preset at the factory and is not allowed to be changed by any means.

Setting Values and Driving Properties:

Value too low = Unprecise steering movements

Value too high = jerky driving movements
jerky, unprecise steering movements

Winding Compensation



**editable value

CAUTION: Danger of Accident
An incorrect setting leads to uncontrollable driving movements.
Do NOT change setting!

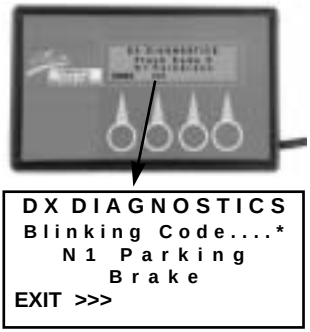
7.0 "DIAG" = Error diagnosis

The DIAG key appearing in the main menu serves to carry out a diagnosis of the entire ACS system.
In the presence of a malfunction, the number of the error will be displayed.
The error number displayed corresponds to the error code of the joystick box.

Example:
Error number 1 = blinking code 1 x blinking

You will find a list of the error codes in the annex.

"DIAG" = Error Check



*Error Number

8.0 Operation

The sequence and the display language of the programming steps depends on the electronics of the wheelchairs.

Should a programming parameter not appear at the position shown, it can be reached by “scroll on” [>>>] of the sequence menu.

8.1 Function of the Key Symbols

EXIT = Serves to save a sequence while simultaneously returning into an upper menu.

>>> or NEXT = Scroll through the menu items.

YES = Switch from the main menu to a sub-menu.

\+ – = Increase (+) / decrease (–) setting value.

← → = Changes direction-related adjustment values. Adjustment direction to the left (←) / to the right (→)

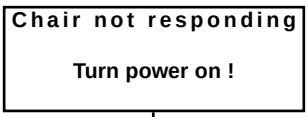
START = Starts a sub-menu which serves calibration and triggers or requires movements.

STOP = Serves to save a sequence while simultaneously terminating the programming sequence.

8.2 Operation in the Main Menu

Display

1. *Connect programmer to joystick box:*

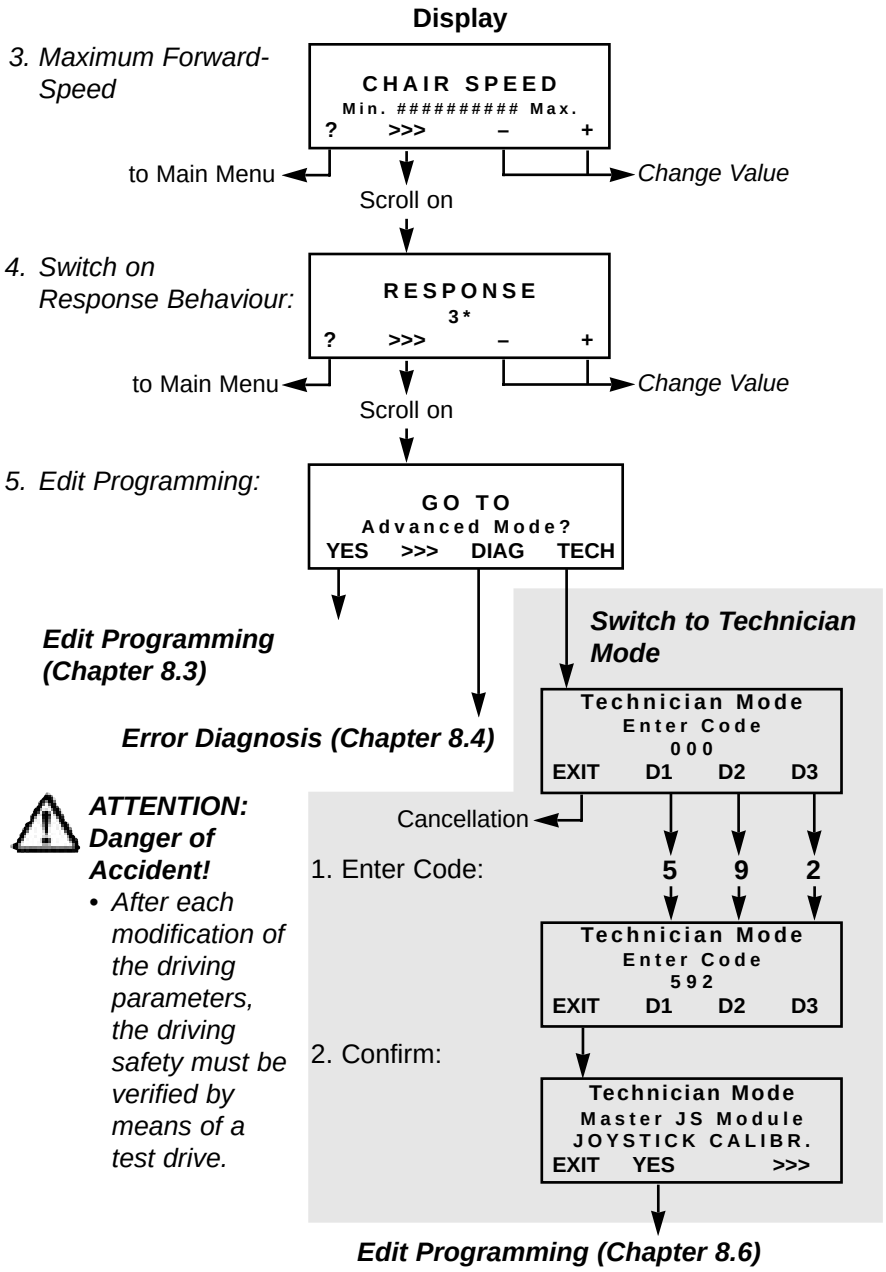


2. *Switch on joystick box:*

continued next page

continued next page

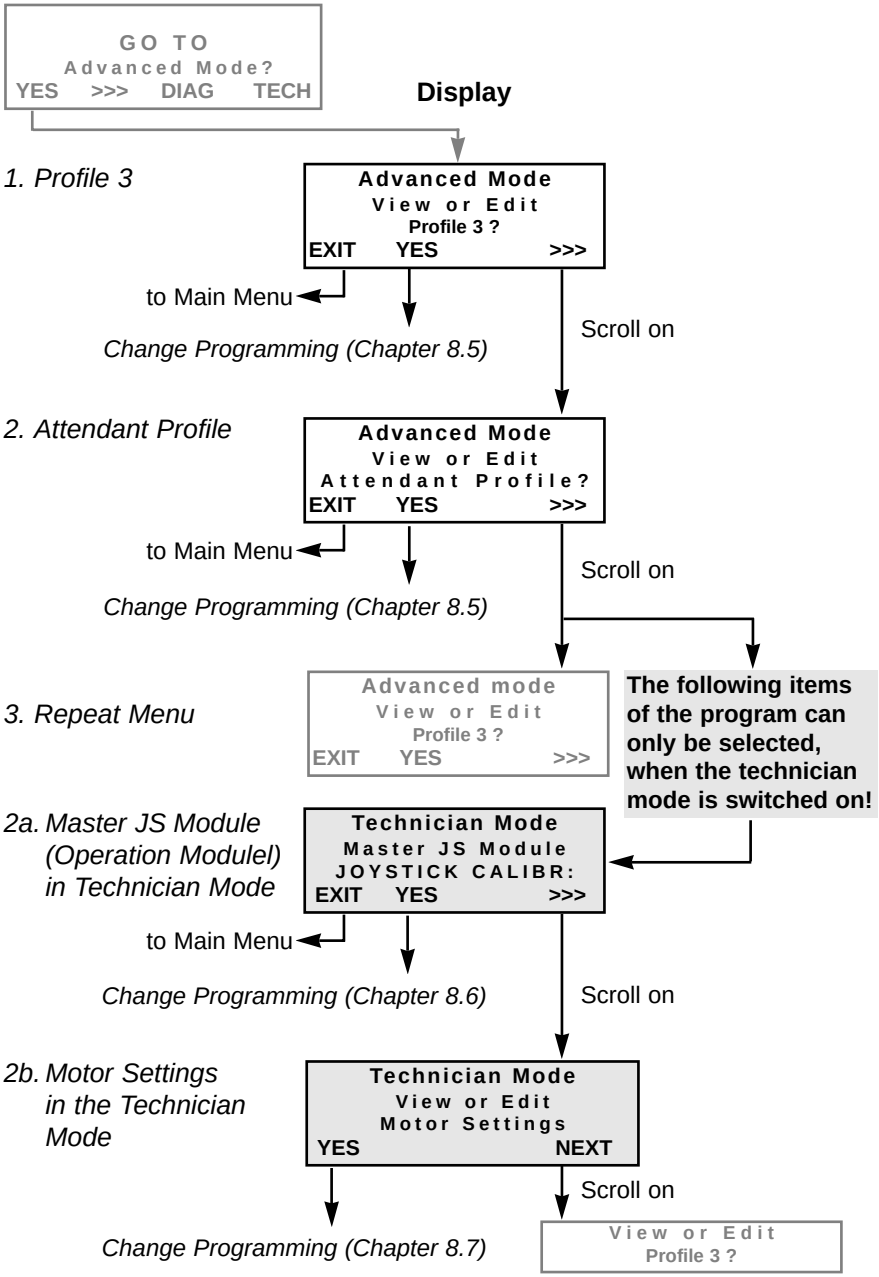
C o n t i n u a t i o n



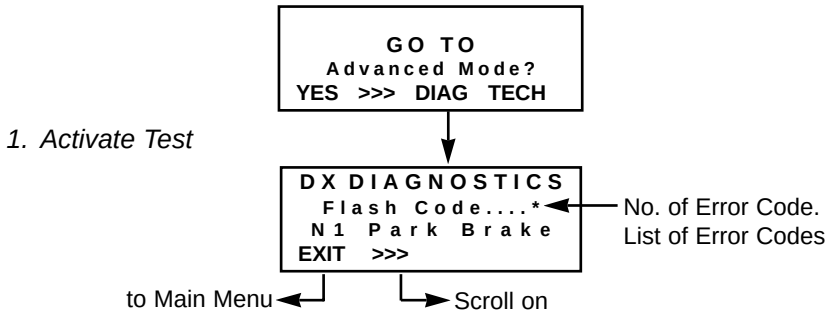
ATTENTION: Danger of Accident!

- *After each modification of the driving parameters, the driving safety must be verified by means of a test drive.*

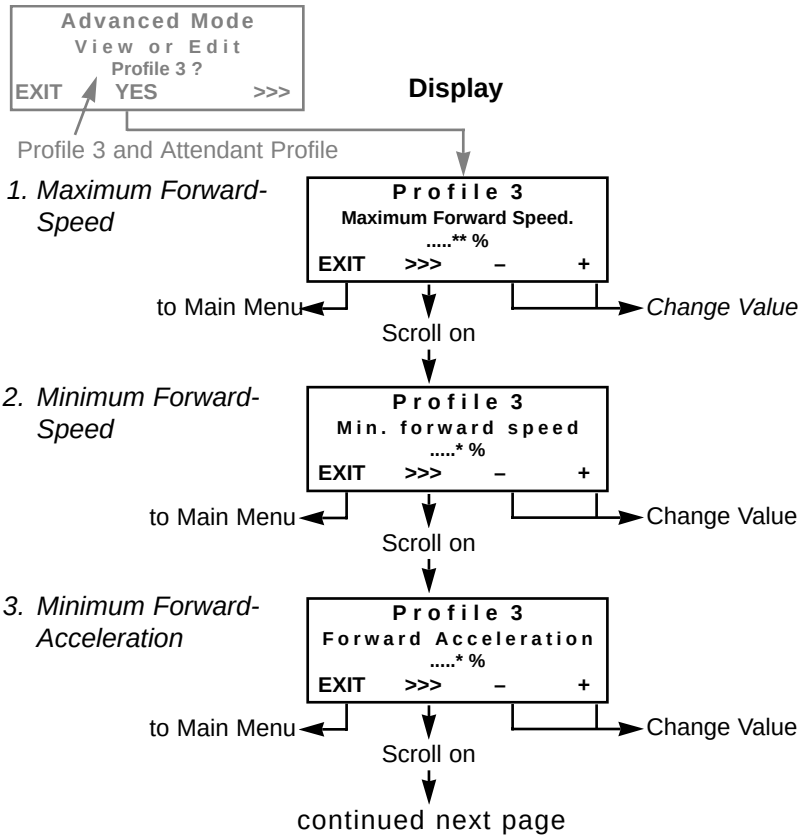
8.3 Operation in the “Advanced Mode” Menu



8.4 Error Diagnosis: “DIAG” Menu



8.5 Edit Programming: Profile 3 / Attendant Profile



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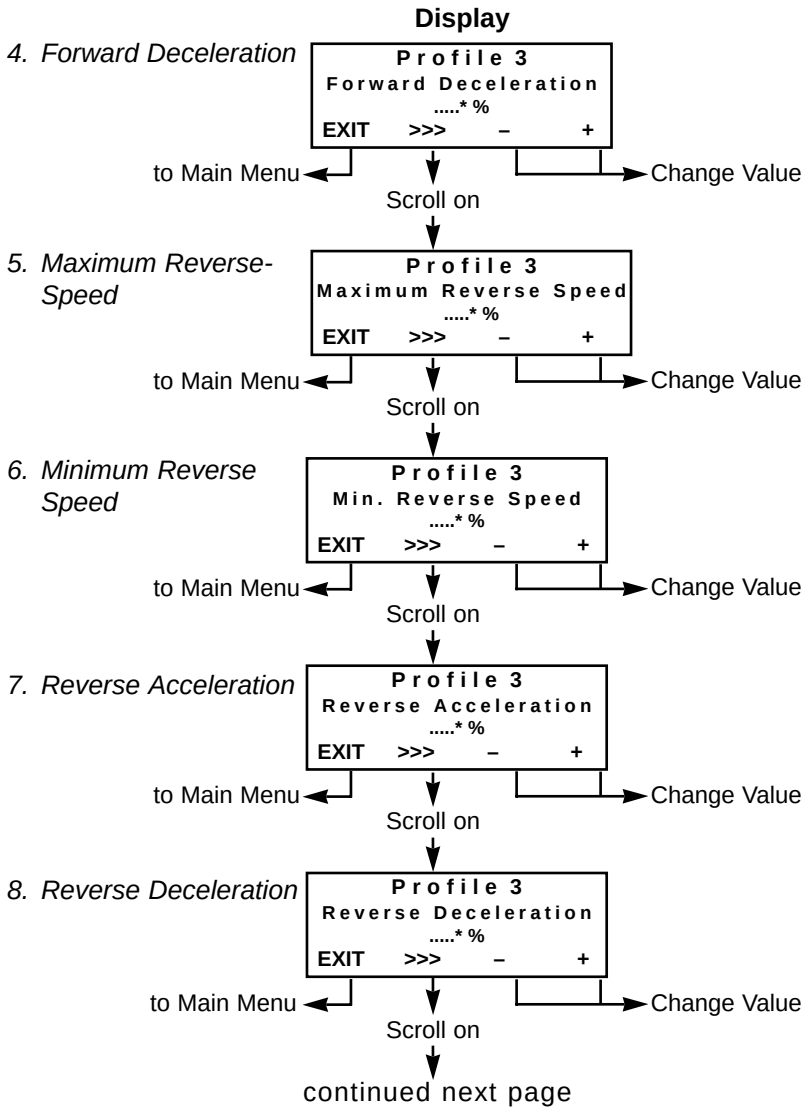
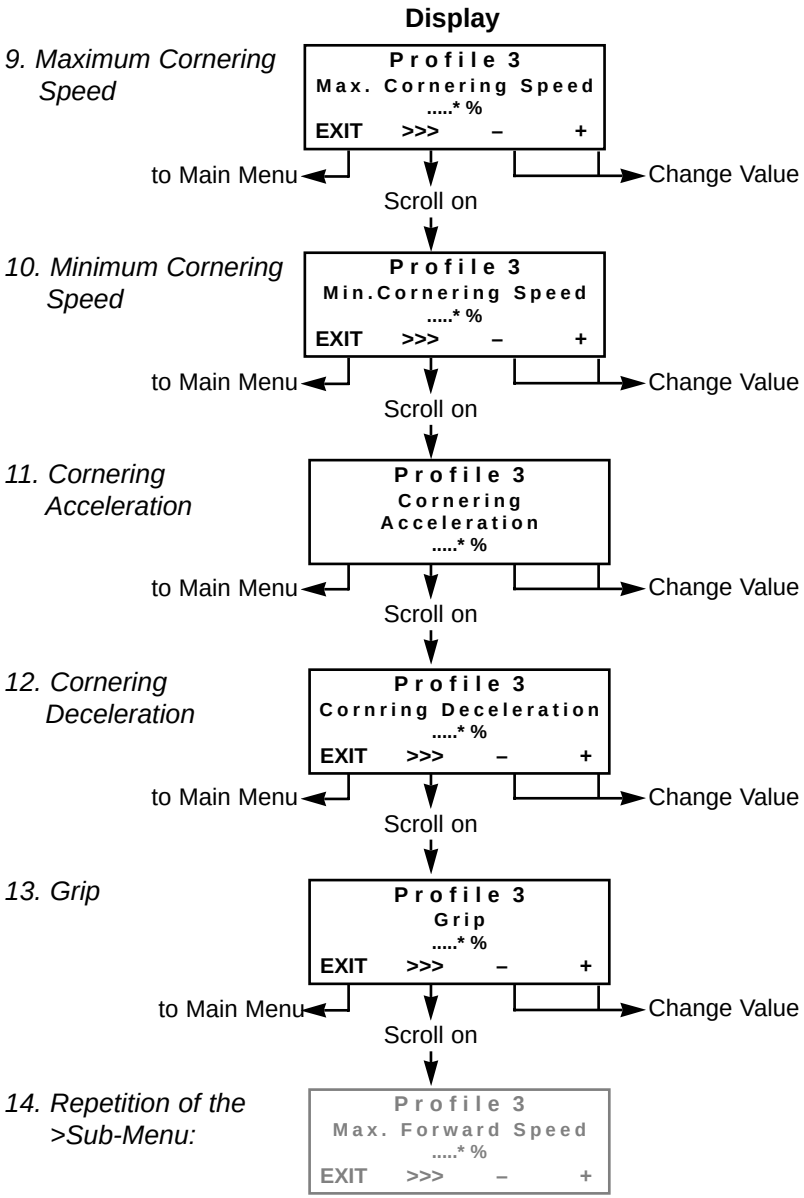
C o n t i n u a t i o n :

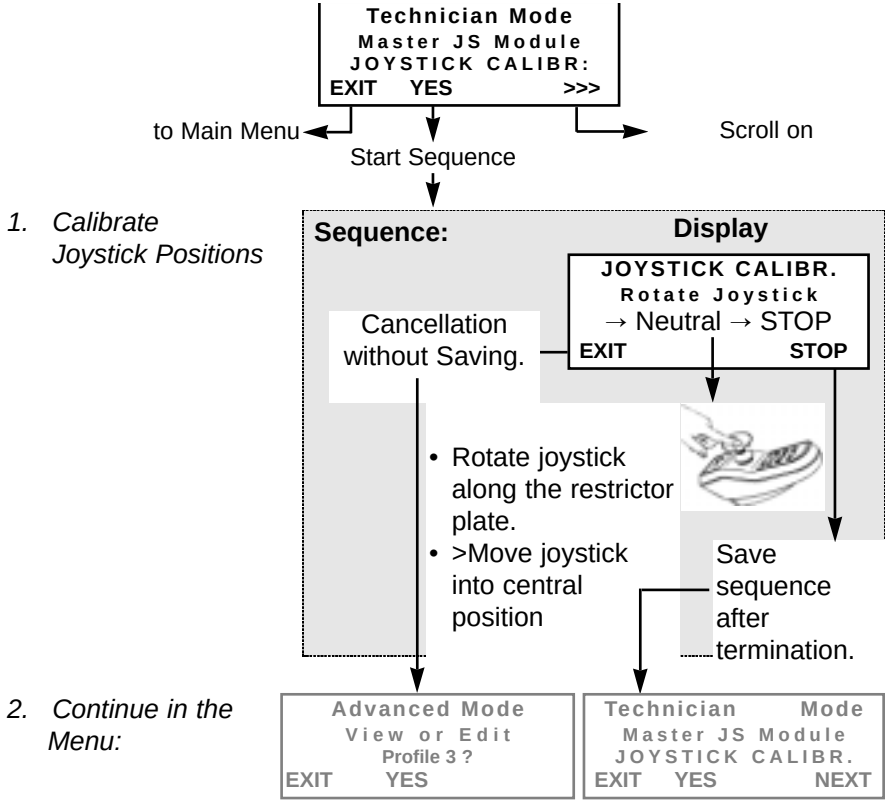


C o n t i n u a t i o n :

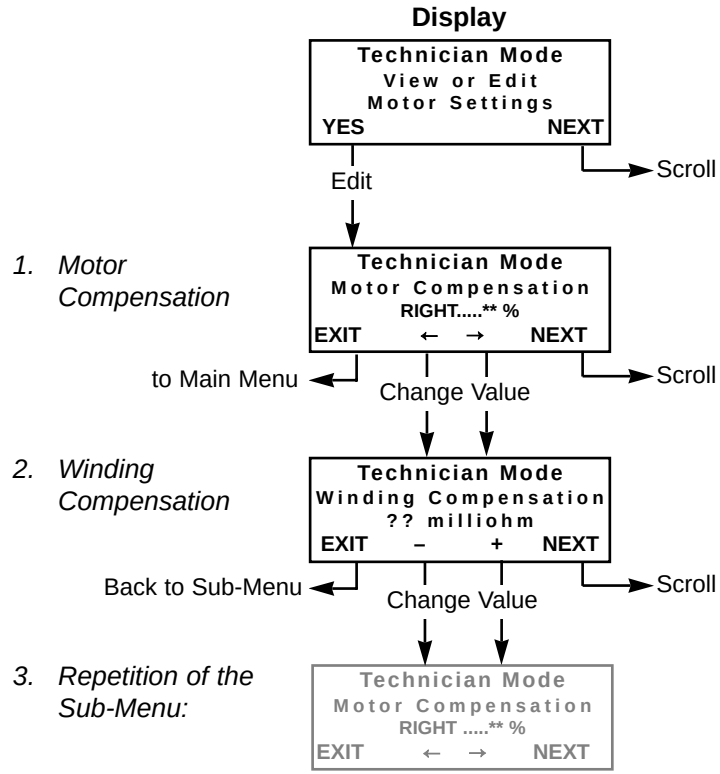


8.6 Edit Programming (Technician Mode):

8.6.1 Master JS Module (Operation Menu)



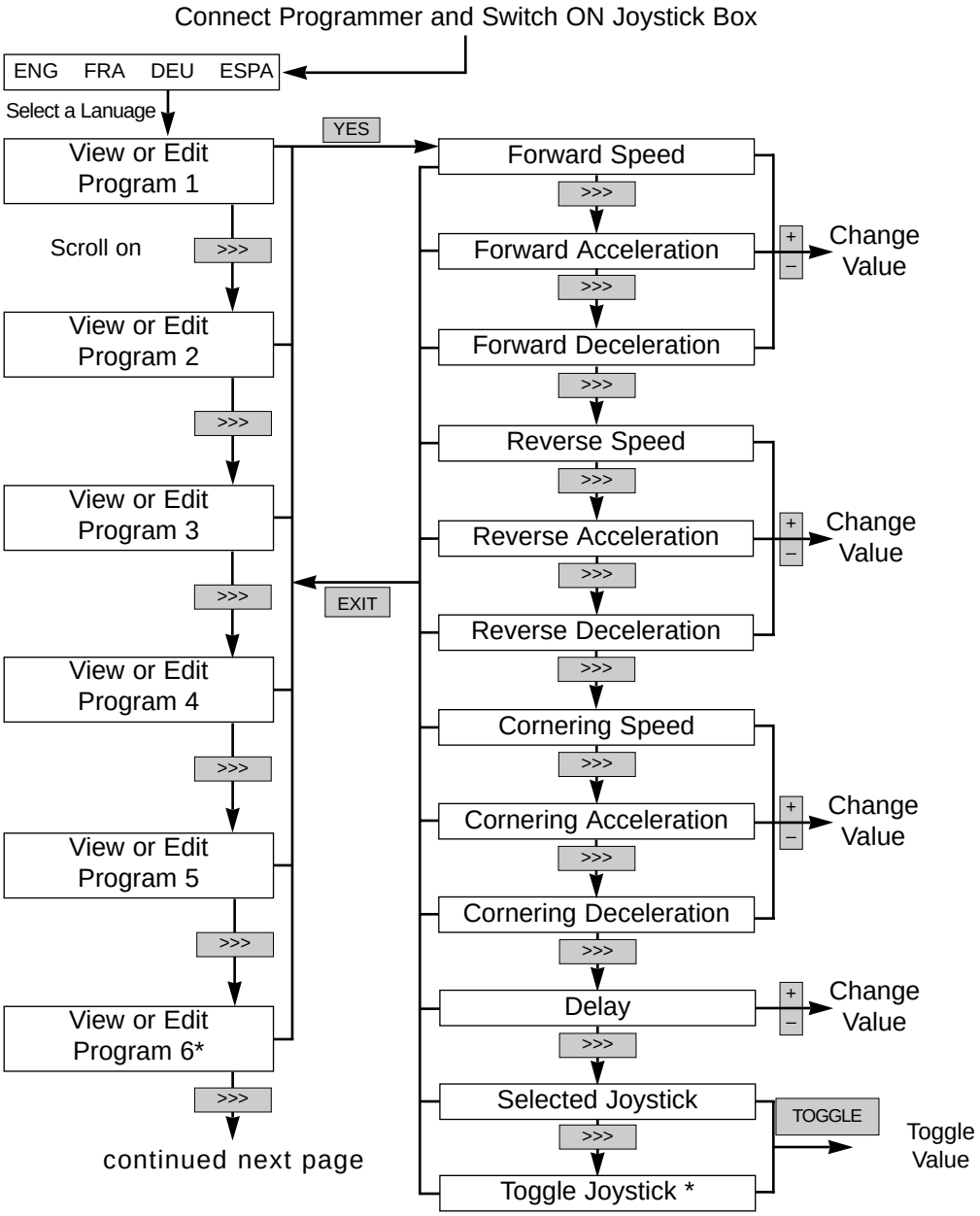
8.6.2 Motor Settings



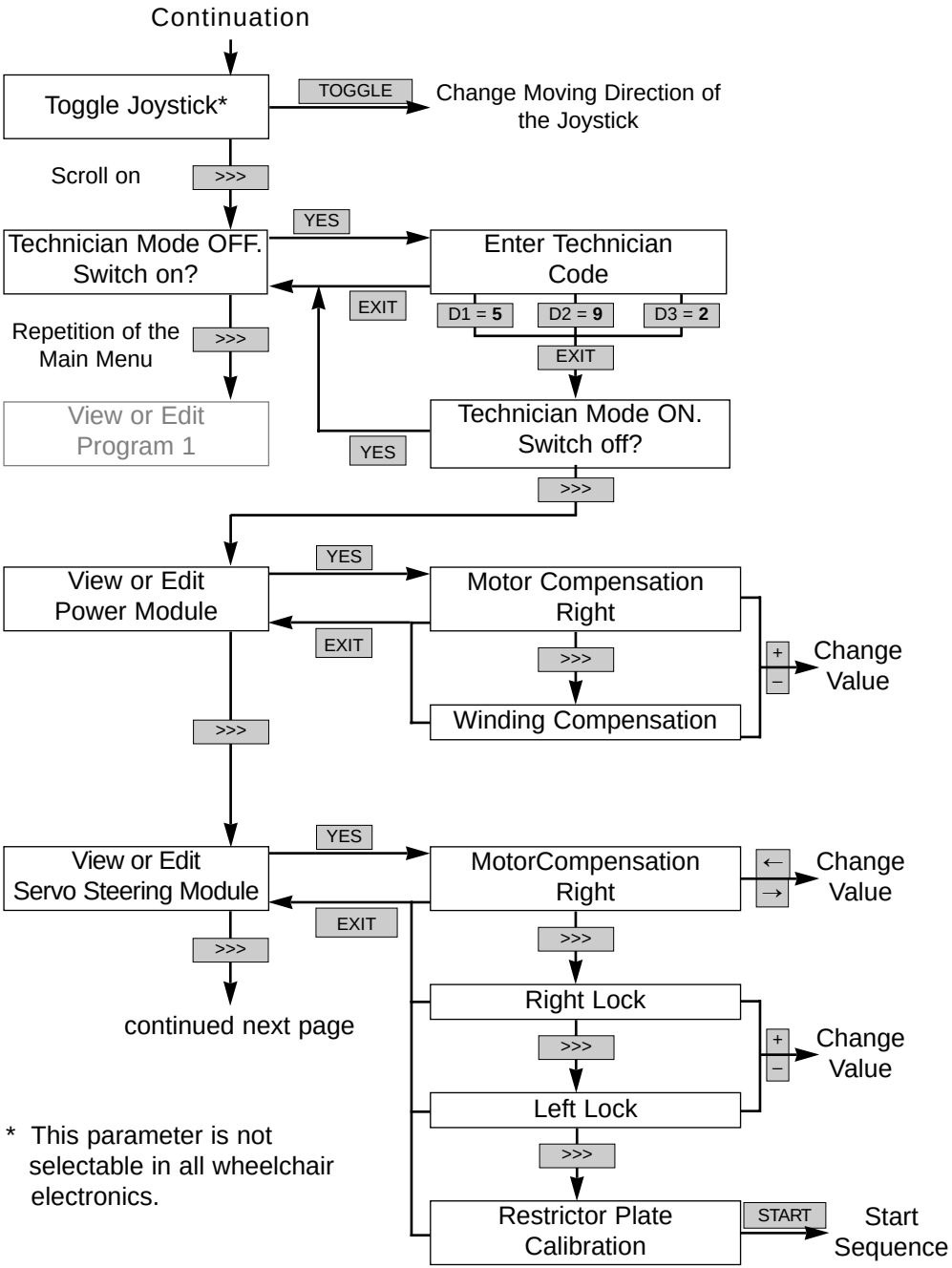
Part C Pogramming of the REM 24 / REM 24 AS / REM 24 S / REM 24 SB Joystick Boxes

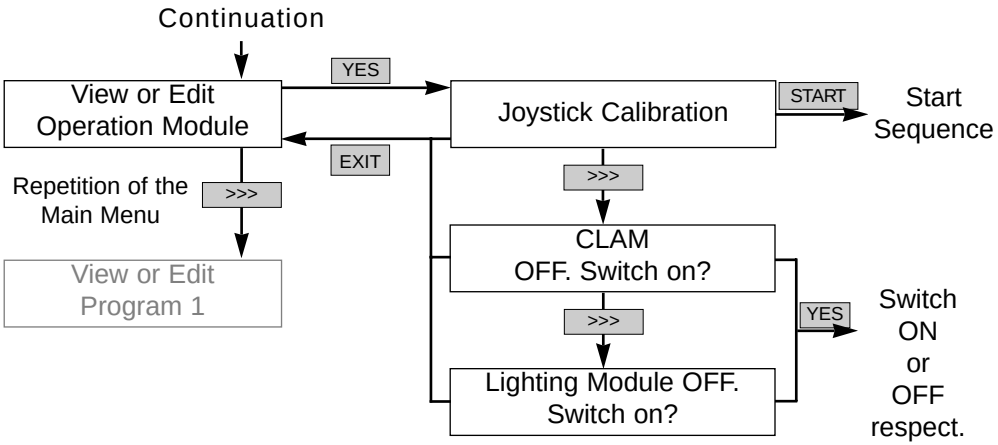
Table of Contents:

1.0 Brief Instructions REM 24 / - AS / - S / - SB



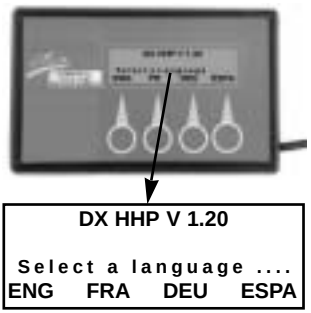
* This parameter is not selectable in all wheelchair electronics.


Continuation
Toggle Joystick*
TOGGLE
Change Moving Direction of the Joystick
Scroll on
>>>
Technician Mode OFF. Switch on?
YES
Enter Technician Code
EXIT
D1 = 5
D2 = 9
D3 = 2
EXIT
Repetition of the Main Menu
>>>
View or Edit Program 1
Technician Mode ON. Switch off?
YES
>>>
View or Edit Power Module
YES
Motor Compensation Right
EXIT
>>>
Winding Compensation
+
–
Change Value
>>>
View or Edit Servo Steering Module
YES
MotorCompensation Right
←
→
Change Value
EXIT
>>>
Right Lock
>>>
Left Lock
>>>
Restrictor Plate Calibration
START
Start Sequence
continued next page
* This parameter is not selectable in all wheelchair electronics.


Continuation
View or Edit
Operation Module
YES
Joystick Calibration
START
Start
Sequence
EXIT
Repetition of the
Main Menu
>>>
>>>
View or Edit
Program 1
CLAM
OFF. Switch on?
>>>
YES
Switch
ON
or
OFF
respect.
Lighting Module OFF.
Switch on?

2.0 Selection of Language

Selection of Language:



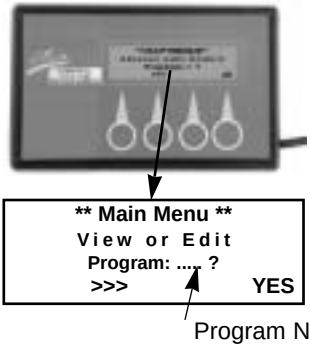
After the programmer is connected and the joystick box switched on, the first thing that will be displayed will be the menu for the selection of a language.

The following languages are available:

English = Selection key: ENG
French = Selection key: FR
German = Selection key: DEU
Spanish = Selection key: ESPA

3.0 Main Menu Display: Programs 1 - 6

Main Menu Display: Program: 1 ?



The program numbers appearing in the programmer's"Main Menu" display correspond to the driving modes of the joystick box.

Program 1 = Driving Mode 1
Program 2 = Driving Mode 2
Program 3 = Driving Mode 3
Program 4 = Driving Mode 4
Program 5 = Driving Mode 5

Program 6 = This program number is intended for the integration of the connectable joystick box for attendants.

NOTE:
"Program 6" is not selectable in all wheelchair electronics.

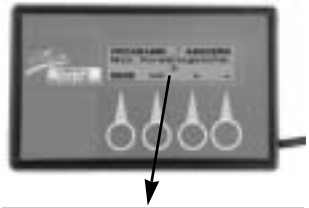
By selecting the "YES" command you will reach the sub-menu for editing the following parameters of programs 1 to 6.

3.1 Maximum Forward, Reverse and Cornering Speeds

This parameter allows the percentage adjustment of the forward, reverse and cornerning speeds at full deflection of the joystick.
To each single program (driving mode) a differently high speed (% value) can be assigned.
The graduation is performed in 5%-steps.

Settings:
10 % = lowest speed
100 % = highest speed

Program Parameter: Maximum Speed



*Selected Program Number
**editable value

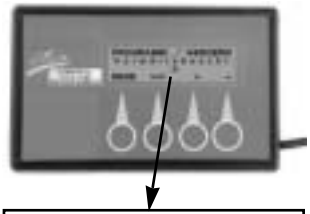
3.2 Forward, Reverse and Cornering Accelerations

This setting allows the percentage regulation of the forward, reverse and cornering accelerations.
The acceleration determines how fast the motor will reach the adjusted maximum speed at full deflection of the joystick.
To each single program.(driving mode) a differently high acceleration value (% value) can be assigned.

The graduation is performed in 5%-steps.

Settings:
10 % = lowest speed
(slow response)
100 % = highest speed
(fast response)

Programming Parameter: Acceleration



*selected program No.
**editable value

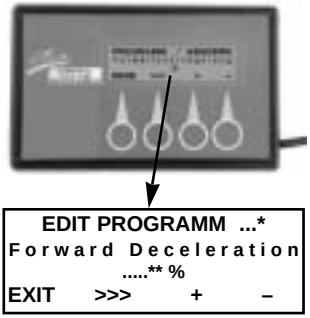
3.3 Forward, Reverse and Turning Decelerations

This parameter allows the percentage regulation of the forward, reverse and turning decelerations.
The deceleration determines how fast the motor will slow down to come to a standstill, if the joystick is brought into the neutral position = central position.
To each single profile (driving mode), differently high deceleration values (%-value) can be assigned.
The graduation is performed in 5%-steps.

Settings:

10 % = lowest deceleration
(slow braking period)
100 % = highest deceleration
(fast braking period)

Programming Parameter: Deceleration



*selected program No.
**editable value

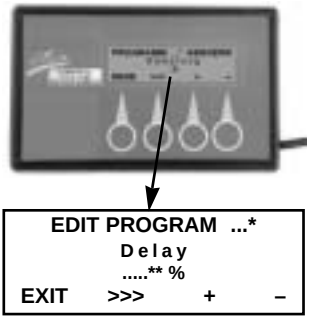
3.4 Delay

This parameter allows the percentage regulation of the delay of the joystick's response behaviour.
The delay determines how fast the movements of the joystick are converted into driving commands.
To each single profile (driving mode) a differently high delay value (%-value) can be assigned.
The graduation is performed in 5%-steps.

Settings:

10 % = lowest delay
(fast response behaviour)
100 % = highest delay
(slow response behaviour)

Programming Parameter: Delay



*selected programming No.
**selectable value

3.5 Selected Joystick

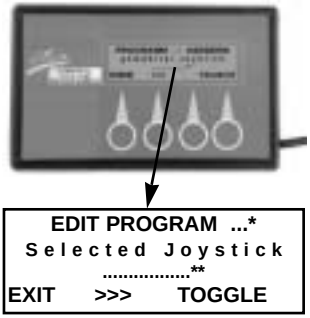
This setting allows the integration of external operating elements (e.g. finger control) or switching elements into the ACS control.
You will find further information on switching elements and their integration under technical information K960 102.

Settings:

internal = joystick function set on the joystick of the joystick box.
external = joystick function set on an external operating or switching element.

Standard Setting = internal

Program Parameter Selected Joystick



*selected program No.
**editable option

3.6 Toggling Joystick

This parameter allows the toggling of the joystick movements for forward and reverse drive.
This setting can be used for all driving programs.

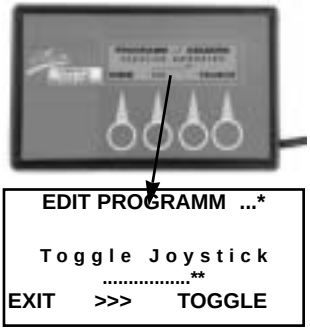
Setting:

NO = Pushing joystick forward >> forward
Pushing joystick backward >> reverse
YES = Joystick function toggled.
Pushing joystick forward >> reverse
Pushing joystick backward >> forward

Standard Setting = NO

NOTE:
This parameter is not selectable in all wheelchair electronics.

Program Parameter: Toggle Joystick



*selected program No..
**editable option

4.0 Main Menu Display: “Toggle Joystick”

The parameter “Toggle Joystick” appearing in the “MAIN MENU” display of the programmer allows to toggle the joystick movement for cornering to the left and to the right.
This setting can be used for all driving programs.

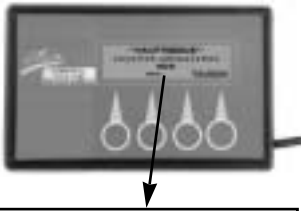
Setting:

NO = Joystick to the right >> right-hand bend
Joystick to the left >> left-hand bend
YES = Joystick function reversed.
Joystick to the right >> left-hand bend
Joystick to the left >> right-hand bend

Standard Setting = NO

NOTE:
This parameter is not selectable in all wheelchair electronics.

Main Menu Display: Toggle Joystick



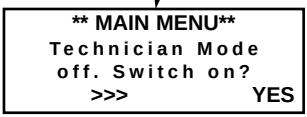
**** MAIN MENU ****
Toggle Joystick
.....**
>>> Toggle

**editable option

5.0 Main Menu Display: “Technician Mode”

The technician mode appearing in the “MAIN MENU” display of the programmer allows to intervene into the electronics of the ACS control.
The electronics can be adapted to the wheelchairs’ different types of equipment.

Main Menu Display: Technician Mode



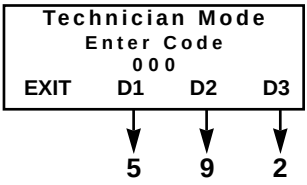
or:

Settings:

OFF. = The parameters of the technician mode are protected and can only be reached by entering the access code.

ON. = The parameters of the technician mode can be edited.

By selecting the “YES” command, you will reach the sub-menu for entering the technician code.



The access code for the technician mode is:

*** 5 * 9 * 2 ***

Enter input sequence 5 x D1 / 9 x D2 / 2 x D3.

NOTE:
After the programmer is disconnected, the technician mode will automatically be protected again (OFF-position).

CAUTION: Danger of Accident!

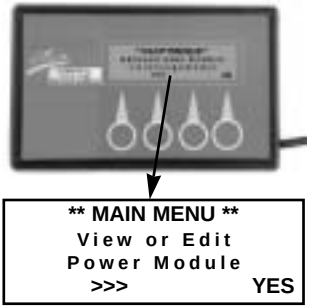
- *Any interventions into the parameters of the technician mode are to be performed only after getting thoroughly familiar with the present operating instructions.*
- *After each modification it is imperative to verify the driving safety by means of a test drive.*

5.1 Main Menu Display (Technician Mode): Power Module”

With the term power module appearing in the “MAIN MENU” display of the technician mode it is made possible to intervene into the electronics of the main menu.

By selecting the “YES” command, you will reach the sub-menu for editing the following parameters.

Main Menu Display: Power Module



5.1.1 Motor Compensation

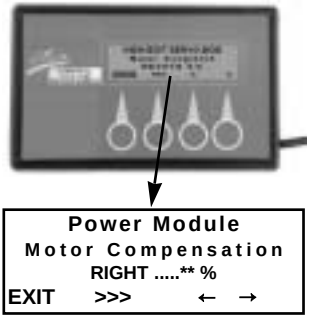
This parameter allows the percentage synchronisation of the left and right motors. Only if both motors are synchronised, an exact directional stability of the power wheelchair can be guaranteed.
The adjustment of these parameters can become necessary, for example, after the replacement of a drive motor.
The graduation is performed in 1%-steps.

Settings:

← = slow down left motor
→ = slow down right motor

Standard Setting = RIGHT 0 %

Program Parameters: Motor Compensation



**editable value

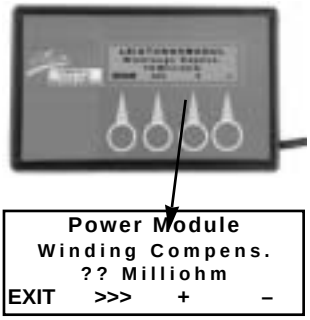
5.1.2 Winding Compensation

This parameter is necessary for the adaptation of the electronics to the different types of motors .
The value is preset at the factory and may not be changed under any circumstances.

Setting Values and Driving Properties:

Value too low = unprecise steering movements
Value to high = jerking driving movements jerking, unprecise steering movements

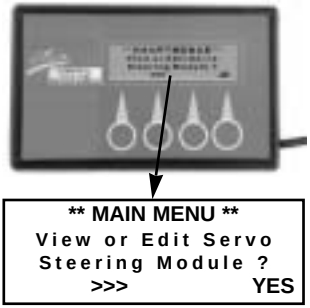
Program Parameters: Winding Compensation



CAUTION: Danger of Accident
An incorrect setting leads to uncontrollable driving movements.
Do NOT change the setting!

5.2 Main Menu Display (Technician Mode): “Servo Steering Module”

Main Menu Disply: Servo Steering Module



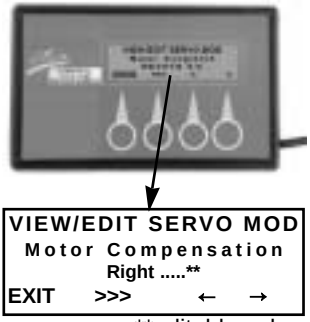
The term Servo Steering Module appearing in the “Main Menu” display of the technician mode allows to intervene into the electronics of the servo-/lighting module.

When selecting the “YES” command you will reach the sub-menu for editing the following parameters.

NOTE:
This parameter is editable only in power wheelchairs that have a servo steering motor.

5.2.1 Motor Compensation

Program Parameter: Motor Compensation



**editable value

This parameter serves to adjust the directional position of the servo steering motors.

The adjustment of this parameter can become necessary, for instance, after the replacement of a servo steering motor.

Setting:

← = Adjusting motor to the left
graduation 0 - 128 left (left correction)

→ = Adjusting motor to the right
graduation 0 - 128 right
(right correction)

Standard Setting = RIGHT 0 %

NOTE:
Very small graduation steps make it possible to perform a very exact adjustment of the directional position.
It is difficult to detect a visible change, that is why the wheels must be carefully observed.

5.2.2 Right Lock

This parameter allows the adjustment of the maximum right steering deflection.

The graduation is performed in 1%-steps.

CAUTION: Danger of Accident
The activation of this setting automatically causes the wheels to turn inward.

Setting:

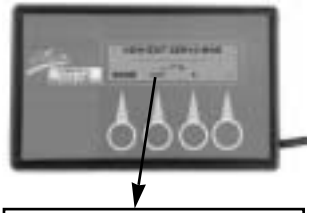
+ = Deflection closer to the mechanical steering lock
– = Deflection farther away from the mechanical steering lock

Standard Setting = RIGHT 79 %

Adjustment Dimension:
Air gap of 1 mm to the mechanical steering locks at maximum steering deflection.

NOTE:
If the lever of the servo steering motor touches the mechanical steering lock, it can lead to its destruction.

Program Parameter: Right Lock



VIEW/EDIT SERVO MOD			
Right Lock			
.....** %			
EXIT	>>>	+	–

**editable value

5.2.3 Left Lock

This parameter allows the adjustment of the maximum left steering deflection.

The graduation is performed in 1%-steps.

CAUTION: Danger of Accident
The activation of this setting automatically causes the wheels to turn inward.

Setting:

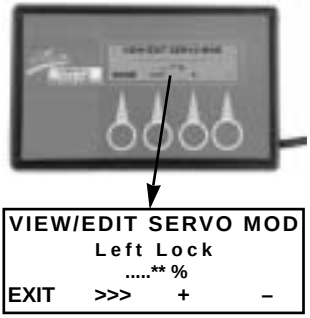
+ = Deflection closer to the mechanical steering lock
– = Deflection farther away from the mechanical steering lock

Standard Setting = LEFT 25 %

Adjustment Dimension:
Air gap of 1 mm to the mechanical steering locks at maximum steering deflection

NOTE:
If the lever of the servo steering motor touches the mechanical steering lock, it can lead to its destruction.

Program Parameter: Left Lock



**editable value

5.2.4 Maximum Motor Speed Calibration

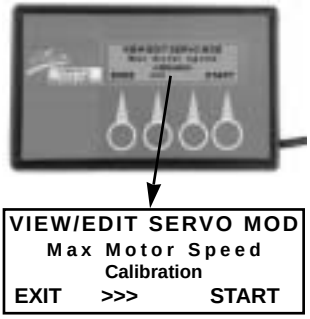
This parameter performs the adjustment of the electronics to the servo steering motor's maximum attainable steering speed.

The setting is performed automatically after the function is triggered (START).
This is done at the factory and no adjustment is necessary.

CAUTION: Danger of Accident
The activation of this setting automatically causes the wheels to turn inward.

Setting:
Should a calibration become necessary, the power wheelchair concerned must be subjected to a test load.

Program Parameter: Maximum Motor Speed Calibration



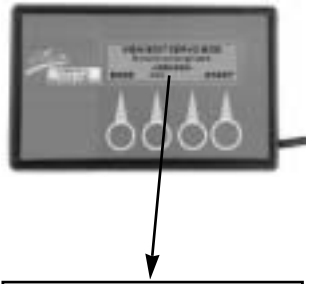
5.2.5 Restrictor Plate Calibration

By means of this parameter the servo steering motor is adapted to the restrictor plate, which causes the servo steering motor to convert the maximum joystick deflection to the left and to the right into exactly the maximum steering movement.

The synchronization is made at the factory and no adjustment is necessary.

By selecting the “START” command you will reach the sub-menu for the calibration of the joystick.

Program Parameter: Restrictor Plate



VIEW/EDIT SERVO MOD		
Restrictor Plate Calibration		
EXIT	>>>	START

Sub-Menu:

RESTRICTORPLATE CALIB.	
Trace Joystick Outline	
EXIT	SAVE

Sequence of Commands:

Trace Joystick = Move joystick along the restrictor plate in rotating movements

SAVE = Save the sequence after termination by pressing down the SAVE key.

EXIT = Causes the cancellation of the option without saving.

Trace Joystick: (Rotate Joystick)

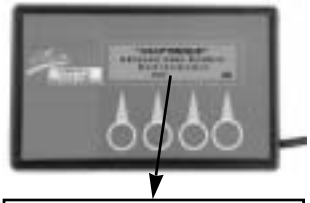
Restrictor Plate = mechanical restriction of the joystick movements

5.3 MAIN MENU DISPLAY (Technician Mode): “Operation Module”

The term operation module appearing in the “MAIN MENU” display of the technician mode allows to intervene into the electronics of the joystick box.

By selecting the “YES” command you will reach the sub-menu for editing the following parameters.

Main Menu Display: Operation Module



```
** MAIN MENU **
View or Edit
Operation Module
>>>          JA
```

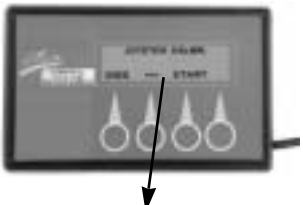
5.3.1 Joystick Calibration

When calibrating the joystick the positions of the joystick’s driving directions will be programmed into the electronics.

The calibration of the joystick is only necessary following the replacement of the joystick.

By selecting the “START” command you will reach the sub-menu for the calibration of the joystick.

Program Parameter: Joystick Calibration



```
JOYSTICK CALIBR.

EXIT   >>>        START
```

Sequence of Commands:

Trace Joystick = Move joystick along the restrictor plate in rotating movements

Neutral = Move joystick into the central position (Neutral)

STOP = Confirm/save the sequence after termination by pressing down the STOP key.

EXIT = Causes the cancellation of the option without saving.

Restrictor Plate = mechanical restriction of the joystick movements

Sub-menu:

```
JOYSTICKCALIBR.
Rotate the Joystick
→ Neutral → STOP
EXIT              STOP
```

Rotate the Joystick:

5.3.2 CLAM: On. Switch Off?

This parameter allows to activate or deactivate the Lighting/Actuator Module (Combined Lighting + Actuator Module).

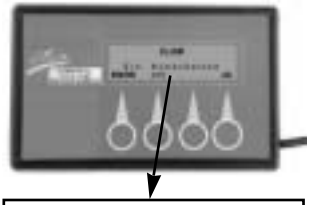
A modification of this setting becomes necessary when retrofitting or dismounting the lighting system or when performing electrical adjustments.

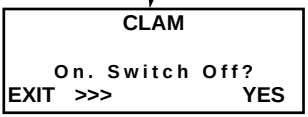
Settings:

On = when lighting/actuator module is mounted

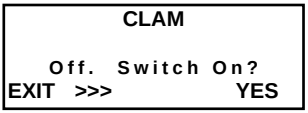
Off = when no lighting/actuator module is mounted.

Program Parameter: CLAM





or:



5.3.3 LIGHTING MODULE: On. Switch off?

This parameter serves to activate or deactivate the lighting module. (Lighting Module).

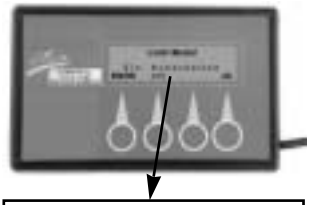
A modification of this setting becomes necessary when retrofitting or dismounting the lighting system.

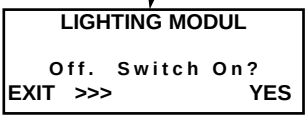
Setting:

On = when lighting module is mounted (12V/24V)

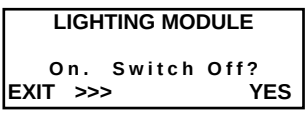
Off = when no lighting system is mounted.

Program Parameter: LIGHTING MODULE





or:



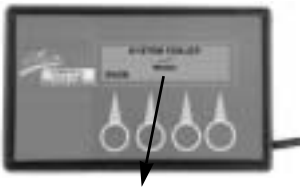
6.0 Error Check

After setting the programmer into operation, it will automatically carry out an error check.
In the presence of a malfunction in the ACS system, the number of the system error will be displayed.
The displayed error number corresponds to the error code of the joystick box.

Example:
Error number 1 = blinking code 1 x blinking

A list of error codes can be found in the annex.

Error Message



SYSTEM ERROR
....*
Module
EXIT

or:

SYSTEM ERROR
....*
Accessories
EXIT

*Error Number

7.0 Operation

7.1 Function of the Key Symbols

EXIT = Cancel input and return to the main menu .

>>> = Scroll through menu items.

YES = Switch from the main menu to a sub-menu.

\+ – = Increase (+) / decreases (–) the setting value.

TOGGLE = Toggle adjustment parameters.

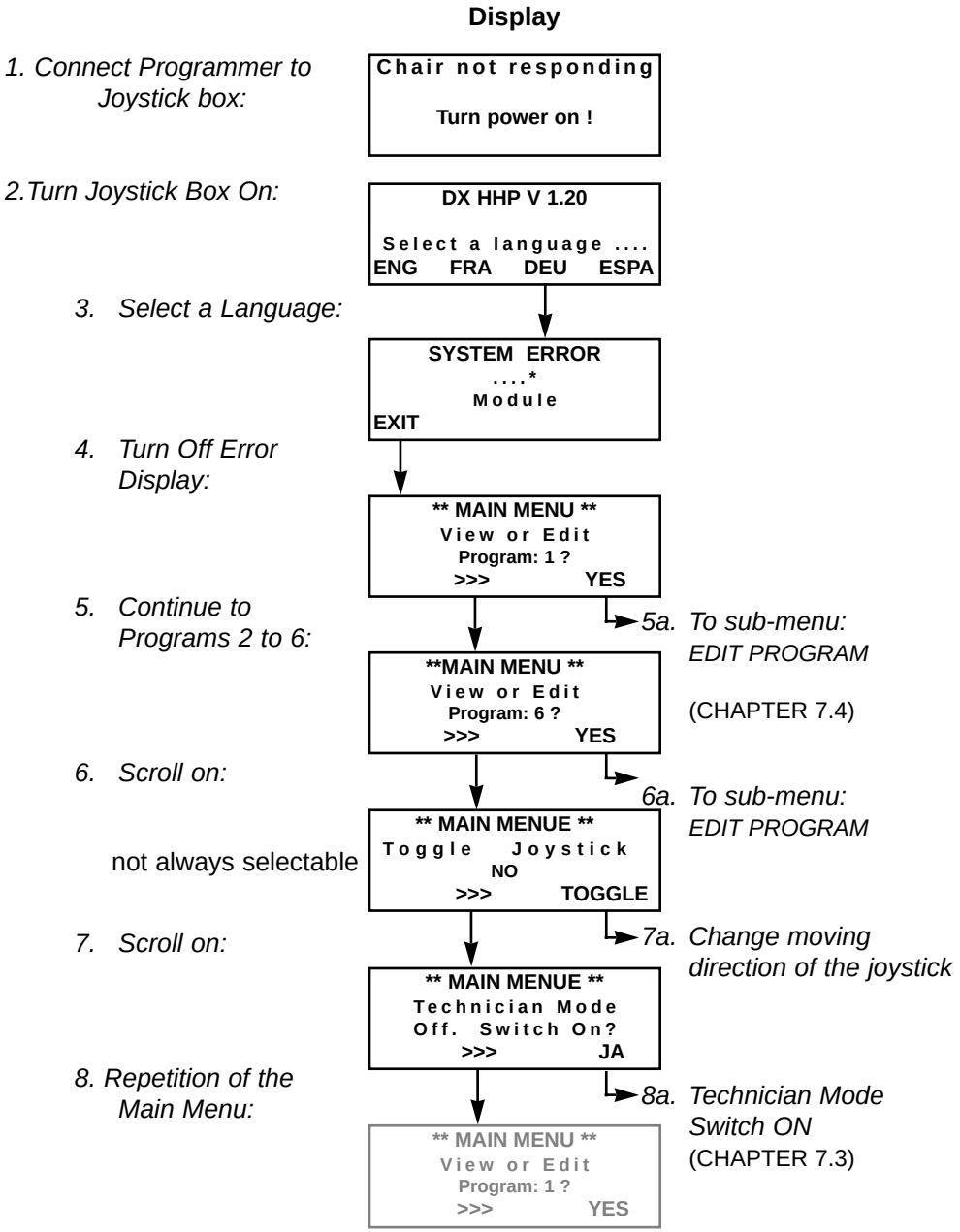
← → = Change direction-related adjustment values.
Adjustment direction to the left (←)/ to the right (→)

START = Starts a sub-menu which serves to perform adjustments and which triggers or requires movements .

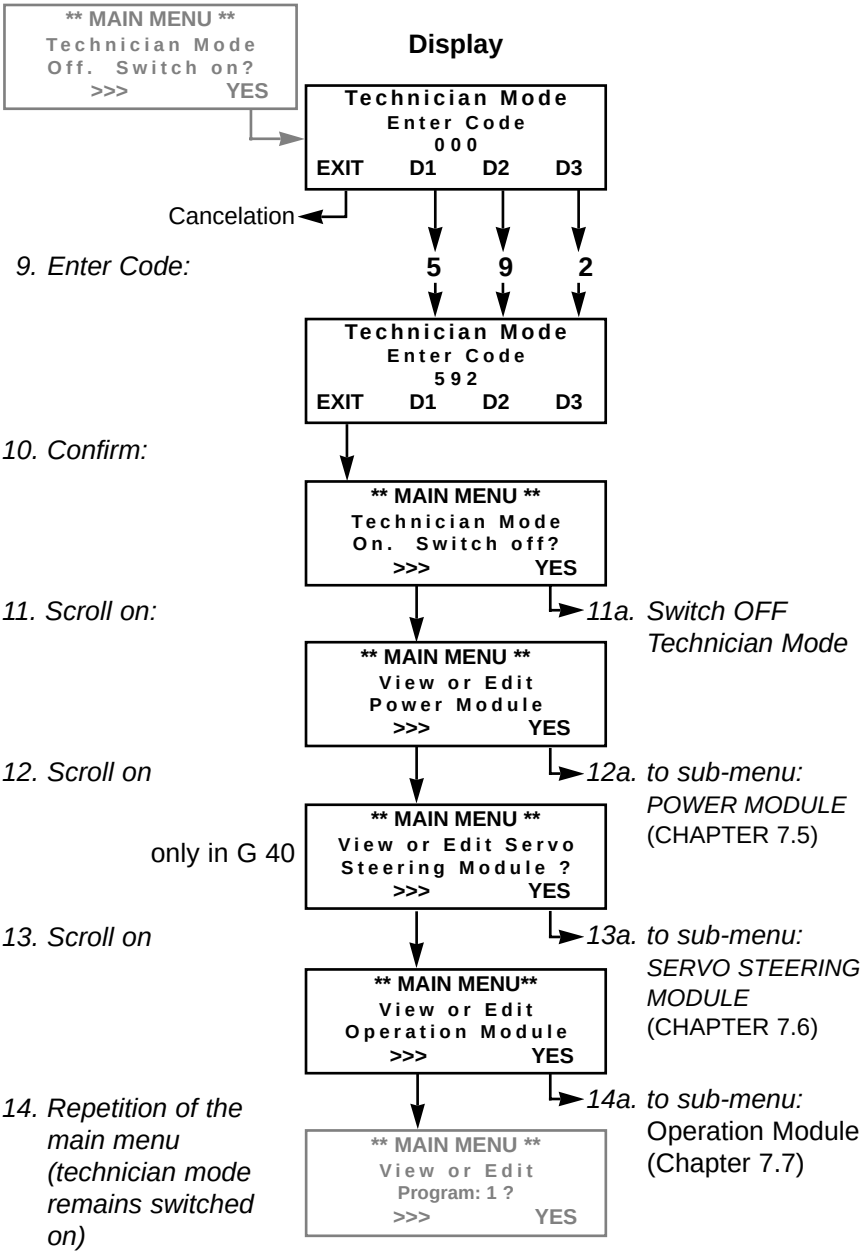
SAVE = Serves to save input data.

STOP = Serves to save a sequence while simultaneously returning to an upper menu.

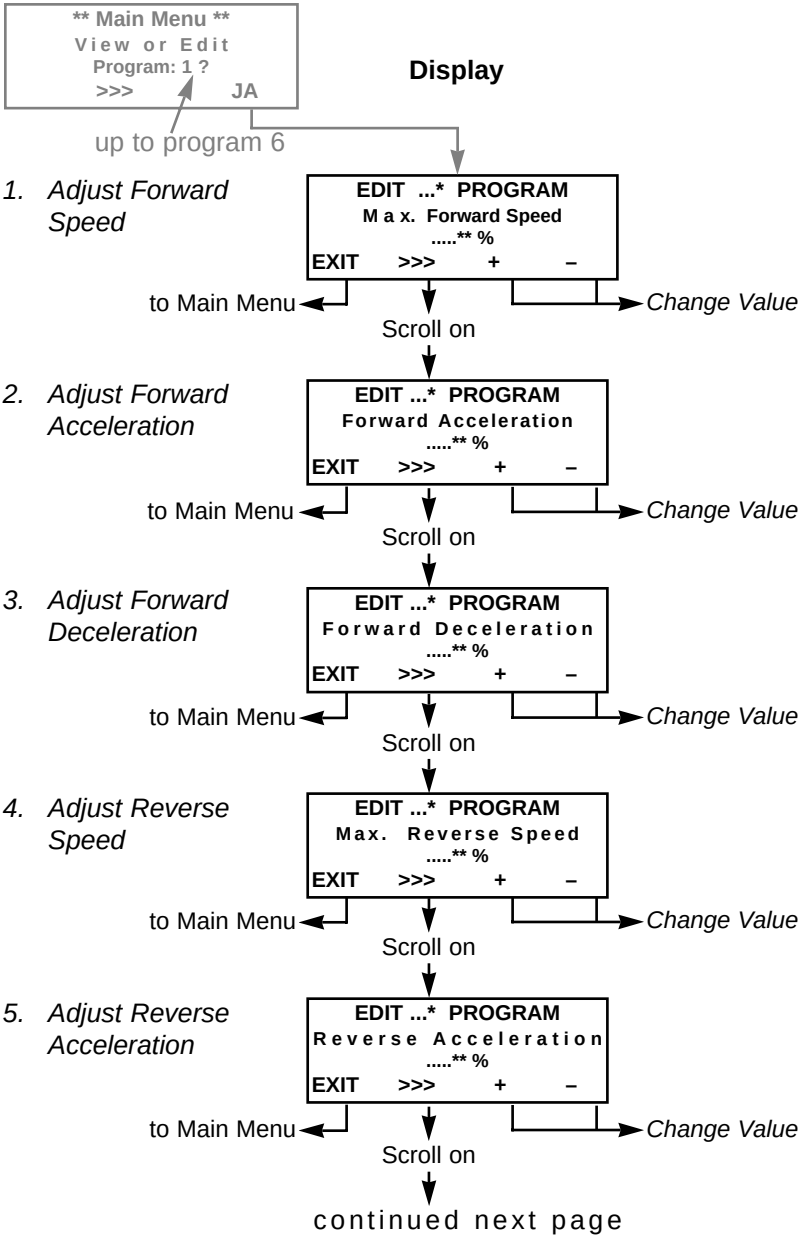
7.2 Operating in the Main Menu



7.3 Operating in the Main Menu “Technician Mode”

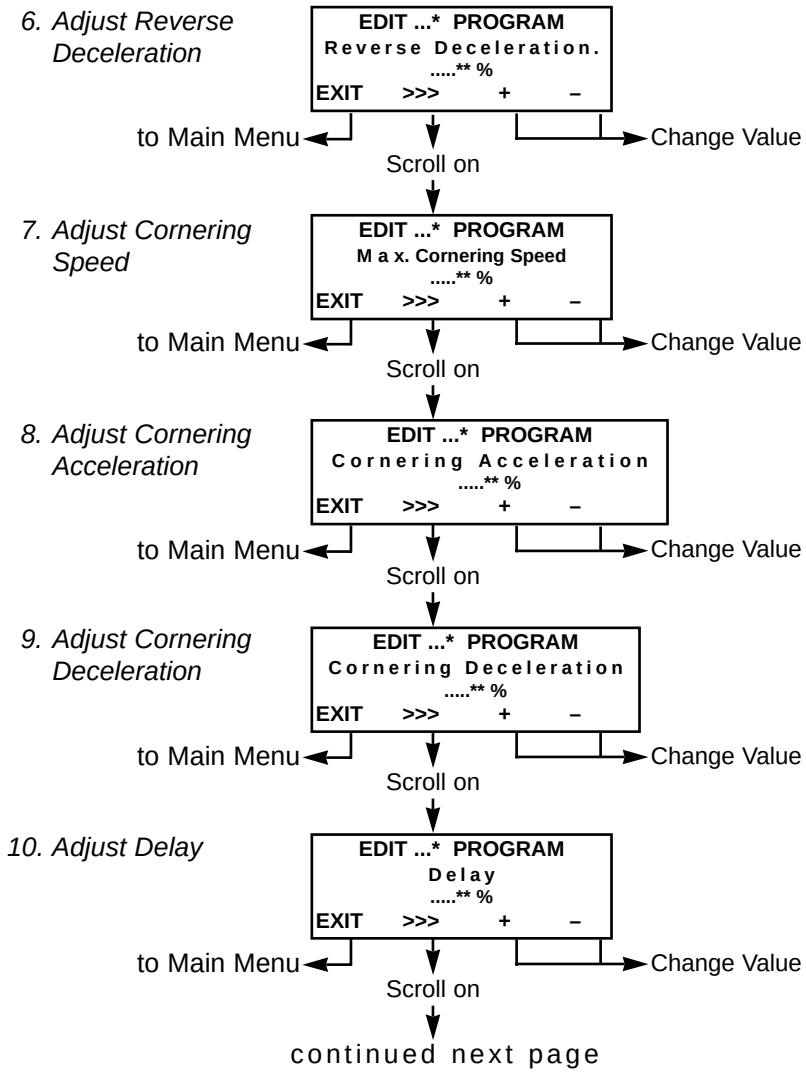


7.4 Operating in the Sub-Menu “Edit Program .....”



C o n t i n u a t i o n

Display

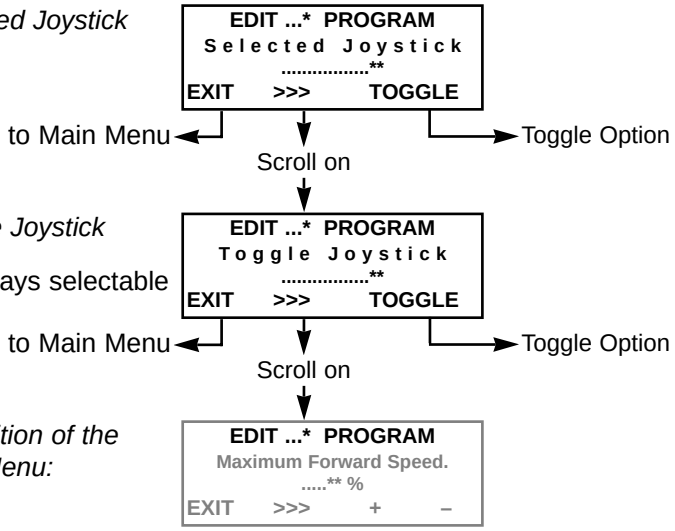


continued next page

C o n t i n u a t i o n

Display

11. Selected Joystick

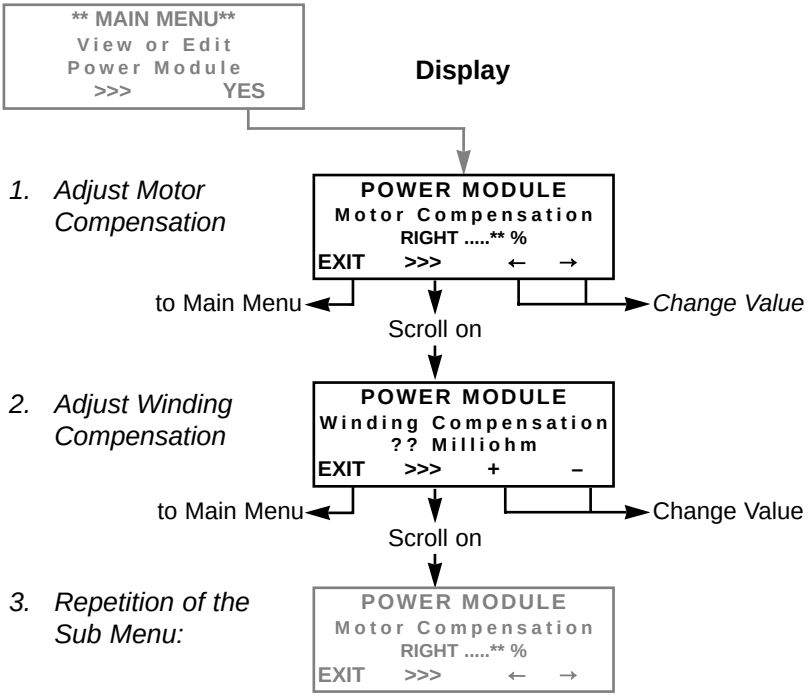


12. Toggle Joystick

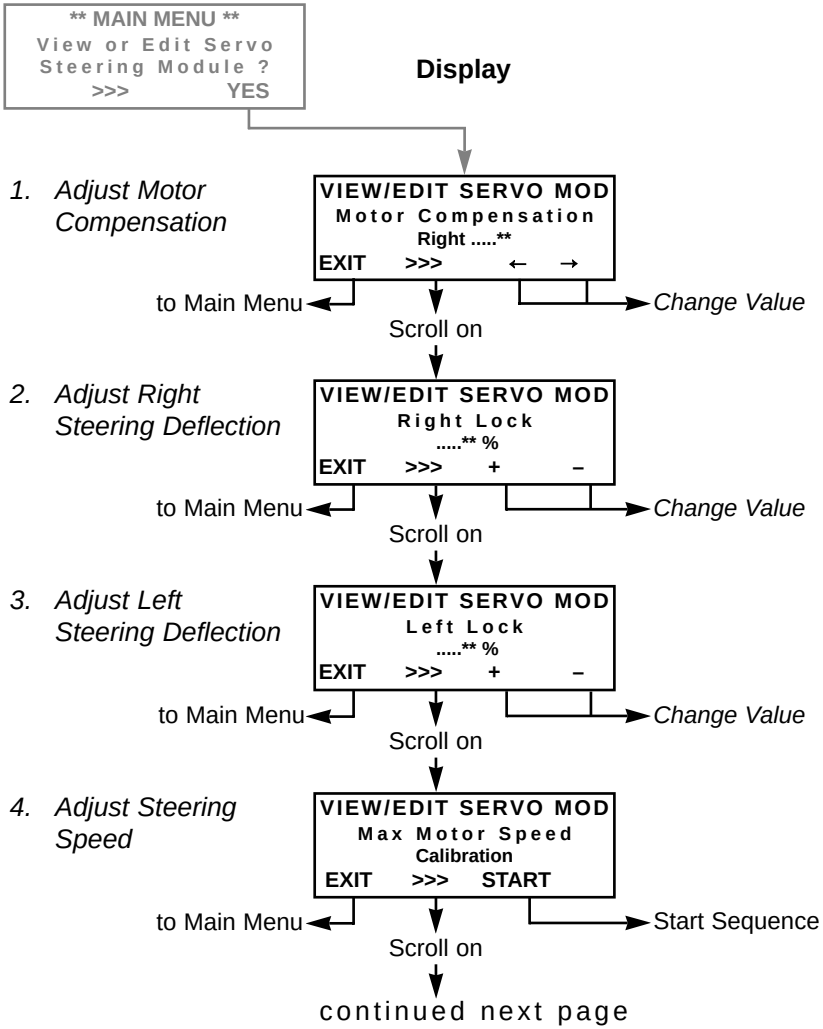
not always selectable

13. Repetition of the Sub-Menu:

7.5 Operating in the Sub-Menu “Power Module” of the Technician Mode



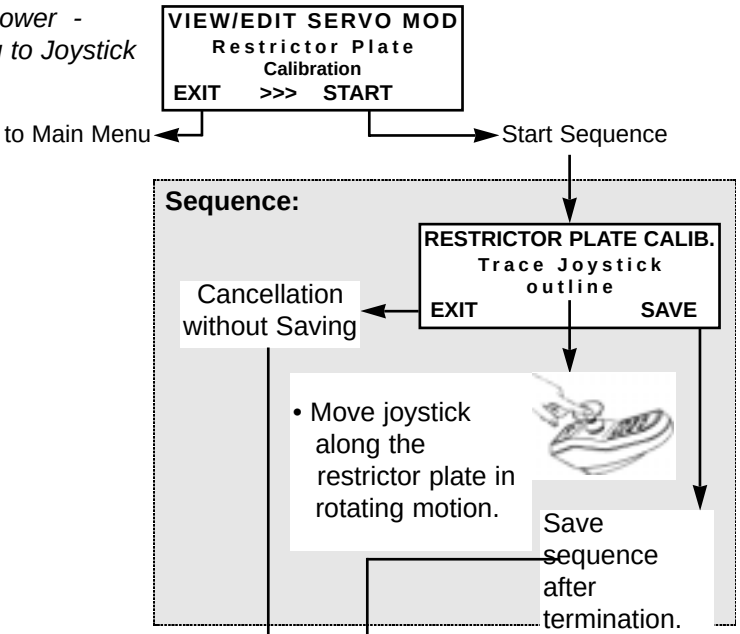
7.6 Operating in the Sub-Menu “Servo Steering Module” of the Technician Mode



C o n t i n u a t i o n :

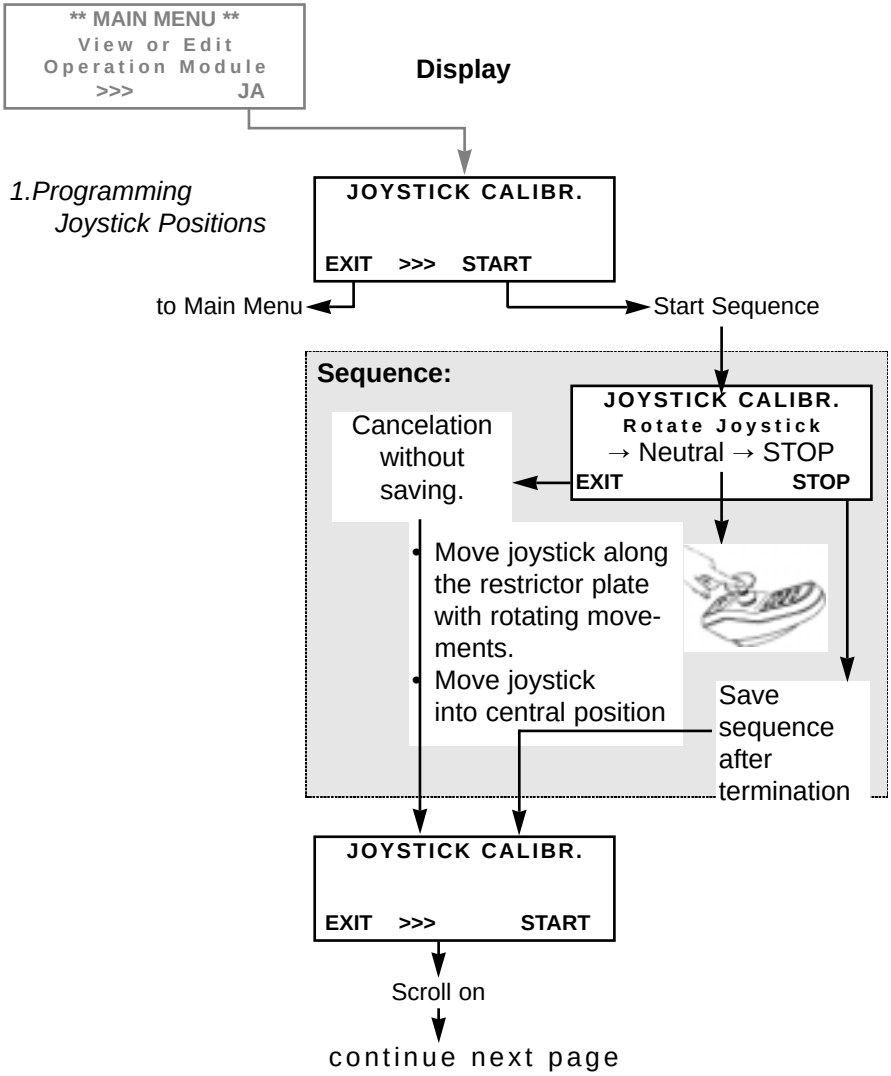
Display

5. *Adapt Power - Steering to Joystick*



6. *Repetition of the Sub-Menu:*

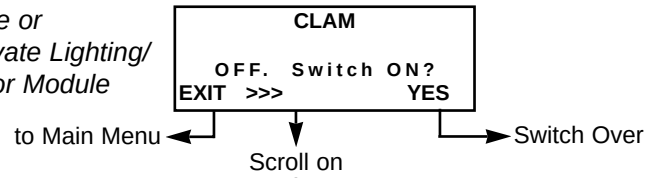
7.7 Operating in the Sub-Menu “Operation Module” of the Technician Mode



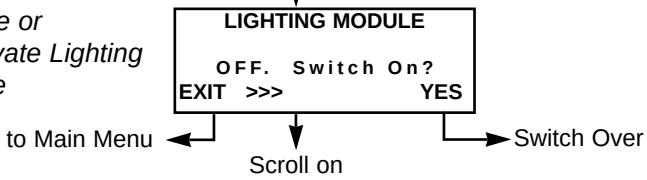
C o n t i n u a t i o n :

Display

2. *Activate or Deactivate Lighting/ Actuator Module*



3. *Activate or Deactivate Lighting Module*



4. *Repetition of the Sub-Menu:*

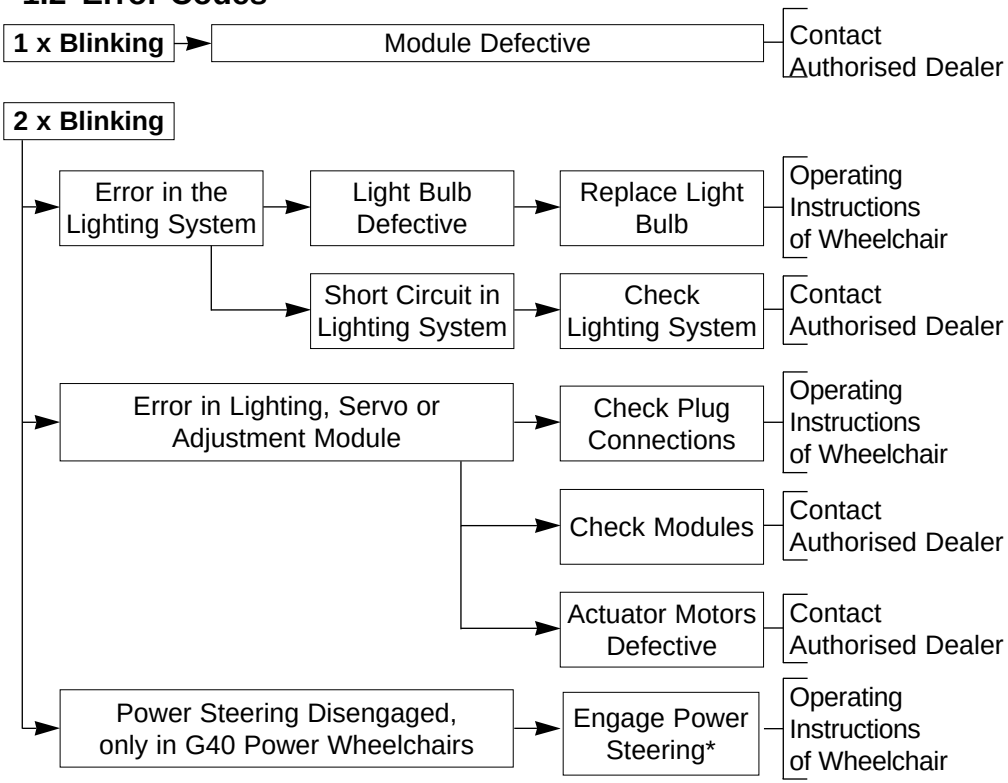
Annex

1.1 Cleaning the Programmer

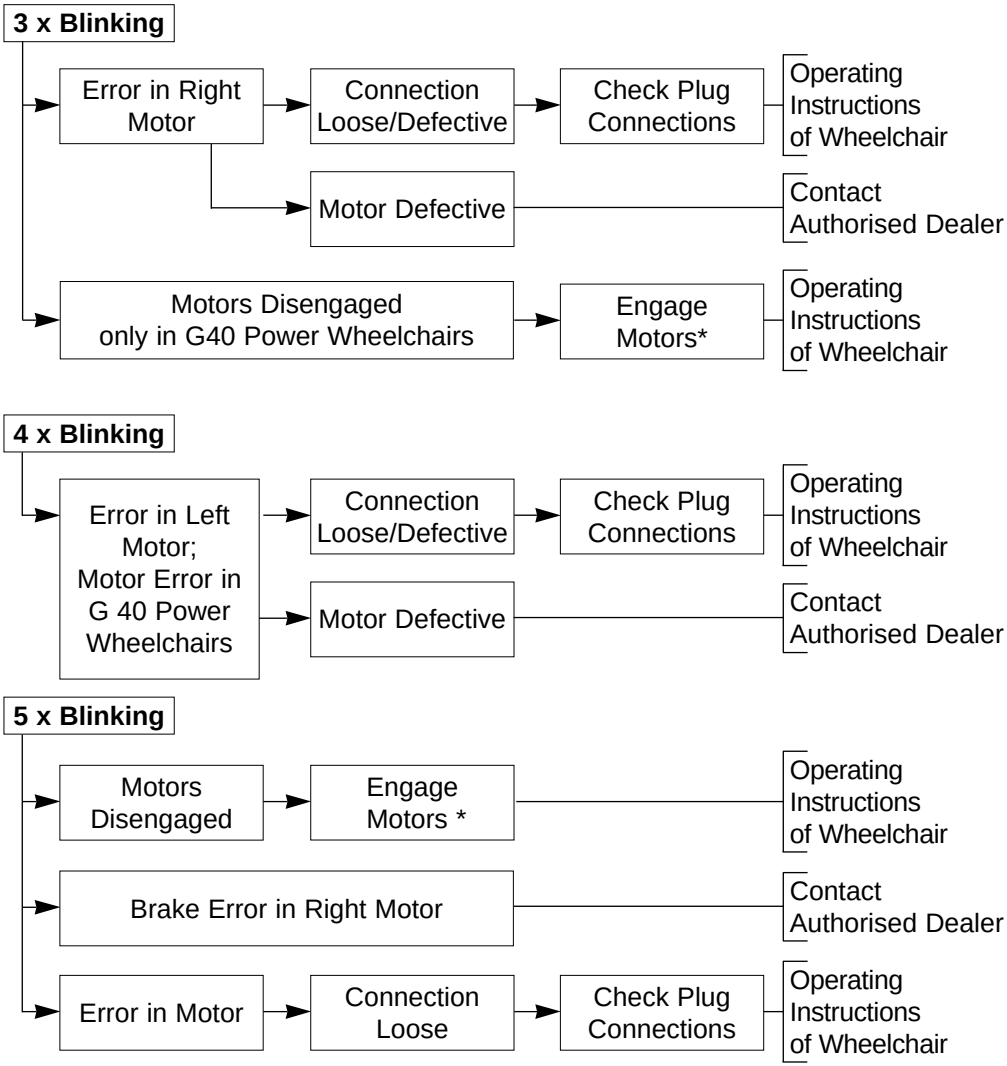
Please observe the following points when cleaning the programmer:

- Clean the programmer only with a damp cloth and a mild detergent.
- Use only abrasive-free detergents for cleaning the programmer.
- Do not subject the programmer to direct water splashing.
- Do not submerge the programmer into water.

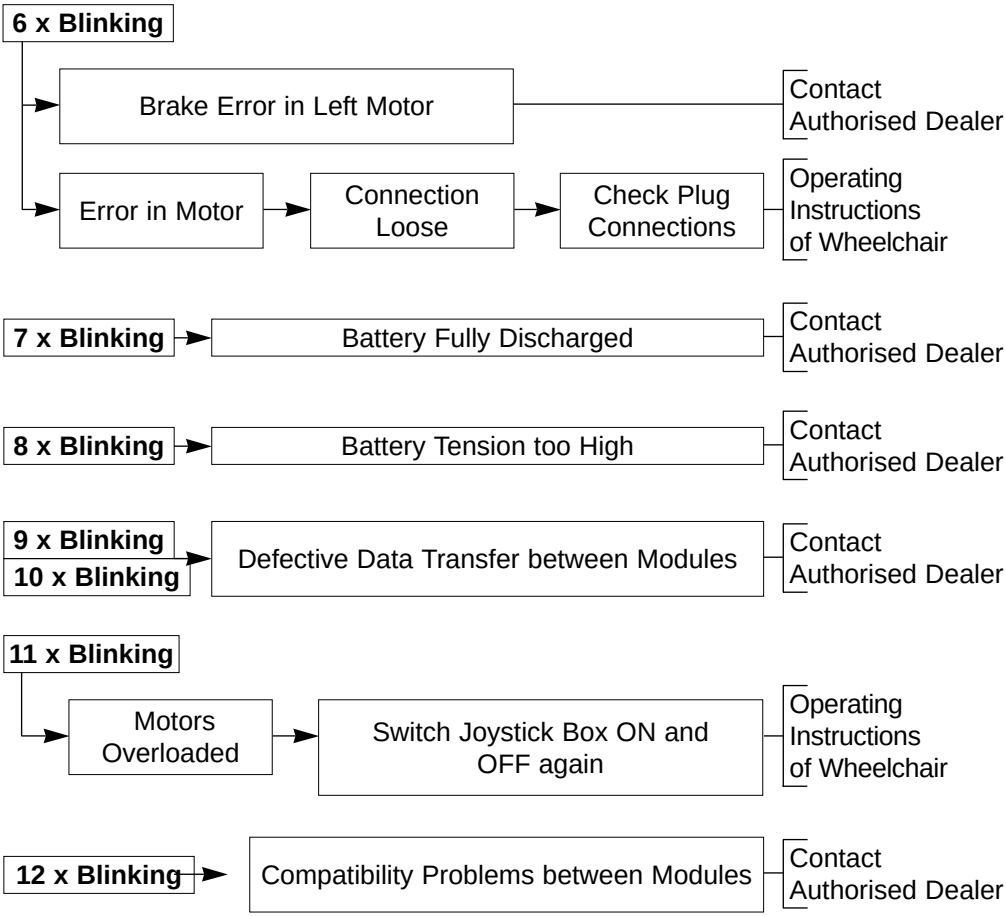
1.2 Error Codes



* Deactivate Blinking Code by Switching Off and On again.



* Deactivate Blinking Code by Switching Off and On again.



* Deactivate Blinking Code by Switching Off and On again.