# Electronic Targets

# User Manual

# System7

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# Contents

# 1    About this Manual

## 1.1    How to find Information

This manual contains basic information about the product lines SA941 and SA9004 of SIUS AG.

You can search for information by means of the list of contents or the glossary (tables, illustrations, drawings and word glossary) in the appendix to this document.

Additionally there is a separate document "Appendix to the System 7 User Manual". This document lists and explains all the targets, programs, settings and commands for the equipment.

Up to date information can be found on our web site: www.sius.com.

## 1.2    How to contact SIUS AG

| Information type | Switzerland | Worldwide |
|---|---|---|
| Sales & Administration | +41 (52) 354 60 60 | Representatives List |
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*Table 1 Sius AG Addresses*

## 1.3 TypographicConventions

This document has been produced using the following conventions:
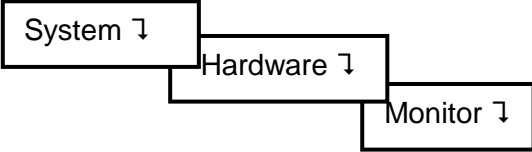
| Visual Representation | Meaning |
|---|---|
| *"Italic font in quotes"* | Reference to another document. |
| Italic Bold font in quotes separated with backslashes:<br><br>**"\System\Hardware\Control Unit"** | Menu path via the keyboard to access a command or setting on the control unit. |
| Framed texts, stepped:<br><br>System ⏎<br>   Hardware ⏎<br>      Monitor ⏎ | Menu path via the keyboard to access a command or setting on the control unit. |
| Framed Font:<br><br>*Enter* -Taste | Description of a key on the control unit keyboard. |
| ➢ Important information: | This arrow points to information meriting particular attention. |
| Courier font<br>Practice...... Start:<br>13:07:09.99 | Print outs from a printer (D112) connected to a control unit. |
| Numeration in brackets:<br>(Chapter 3.2.3 Designation) | Reference to a chapter in this document. |
| Words in capital and in quotes<br><br>„OFFLINE" | Reference to a status of the control unit. The status is displayed in the status window. |

*Table 2 Typographics Conventions*

# 2     Getting started

## 2.1     Connecting and turning on Devices

In order to use an Electronic Scoring System, at least one control unit, one monitor and one detection system have to be connected and supplied with power.



*Figure 1 Example Devices*

➢ The Monitor, depending on the model, must be switched on by its own power switch. Please make sure that the Brightness Control on the underside of the equipment is set to the central position.

At least the following cables must be connected:
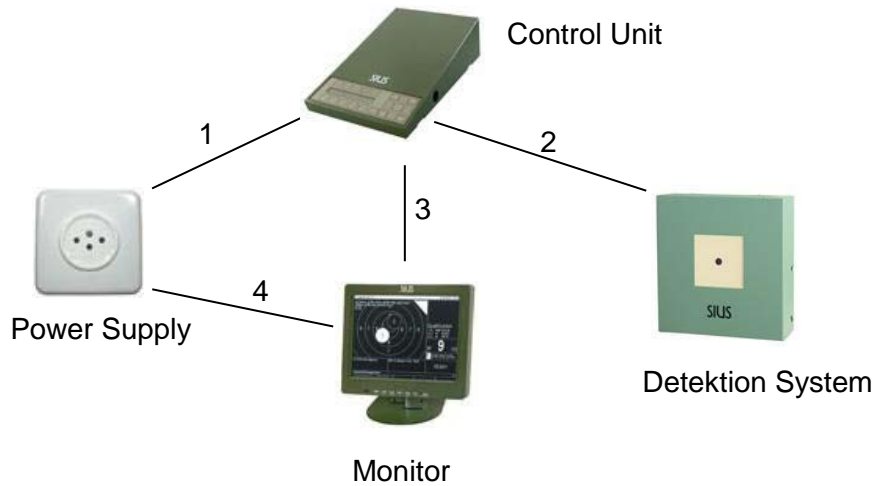


*Figure 2 Minimal Cabling*

| N°. | Device | Connection to | Description |
|-----|--------|---------------|-------------|
| 1 | Control Unit | Power Supply | Power Supply (e.g. by RJ45 cable) |
| 2 | Control Unit | Detektion System | Communication Cable(RJ45 sockets) |
| 3 | Monitor | Control Unit | Video Cable (VGA) |
| 4 | Monitor | Power Supply | Power supply cable or special power supply cables for M94 |

*Table 3 Minimal Cabling (Connections)*

After turning on and starting up the control unit for the first time the screen should show the following content:

The version details (Main V7.0i etc.) will differ from the example:
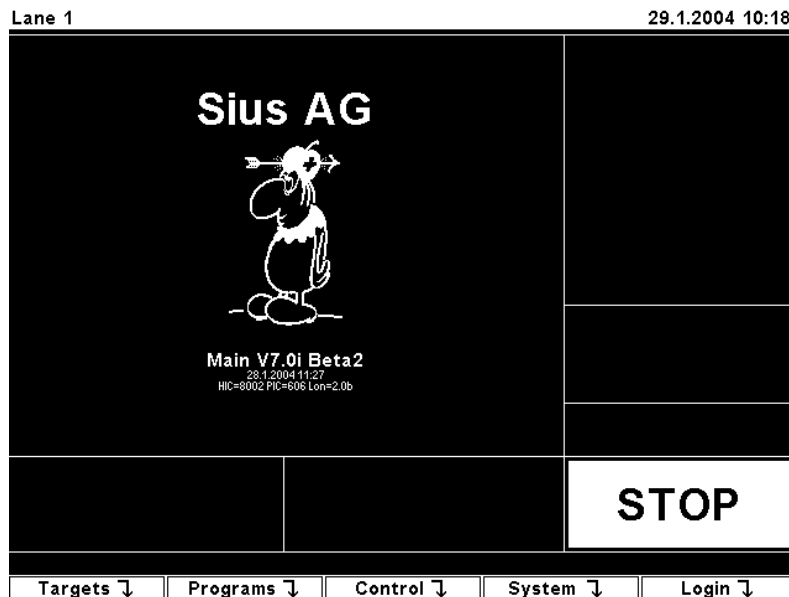


*Figure 3 Screen Display after First Startup*

## 2.2     Connect the Target

If there isn't a target connected to the control unit the status changes to "OFFLINE" (after 2 minutes at the latest). Thus the target has to be configured to the correspondent control unit. If the target features a rotary control for configuration (LS10/HS10/HS2550/LS10G2 and some LME), programme the subnet address to the corresponding lane number und the node to 0 (zero). After a re-start of the target it will be connected to the control unit. Therefore the status changes to "STOP" or "READY".

Doesn't the target feature these rotary controls it has to be programmed via service-pin. For that use the following command:

*„\System\Hardware\Target\Connect"*
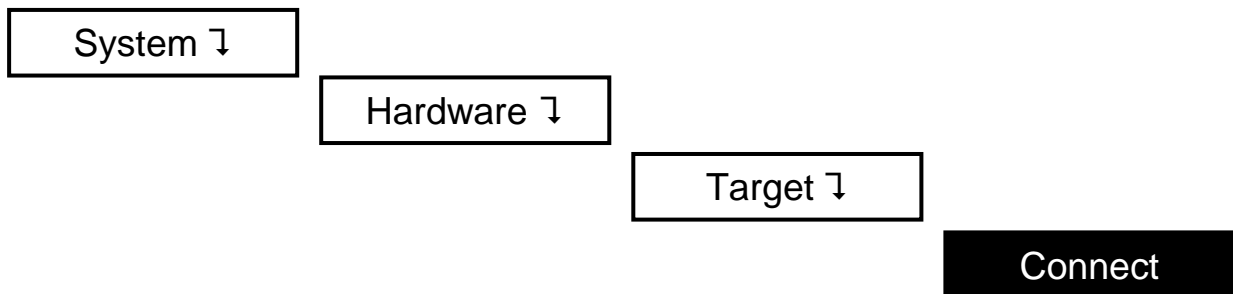
➢ The framed text represents the menu points of the LCD-Menu. They can be selected by pressing the corresponding function keys. The **"\System"** directory can be accessed by pressing the $F_4$ function key. By doing so, the content of the LCD-Menu changes. Now the "**\..\Hardware"** directory is displayed under the function key $F_4$. By pressing the $F_4$ function key you can switch to the**"\Hardware"** directory.

➢ By pressing the $Esc$ key you can move up one directory level.

➢ By pressing the $Home$ key you can return to the home directory at any time.

As an alternative to the keyboard, you can enter this command by reading the following barcode with the barcode scanner:

System\Hardware\Target\Connection



9 9 0 6 3 2 0 0 6 7

*Figure 4 Connect Target Function*

This barcode switches the control unit to a special configuration mode. The control unit waits for a service PIN message from any LON Measurement Electronic System. This message can be created on the target, either when the service PIN is pressed or when shooting takes place. However, a shot only triggers a Service PIN message if the target was not previously configured. The one target that first reports this Service PIN message is reprogrammed by the control unit to its own target number.

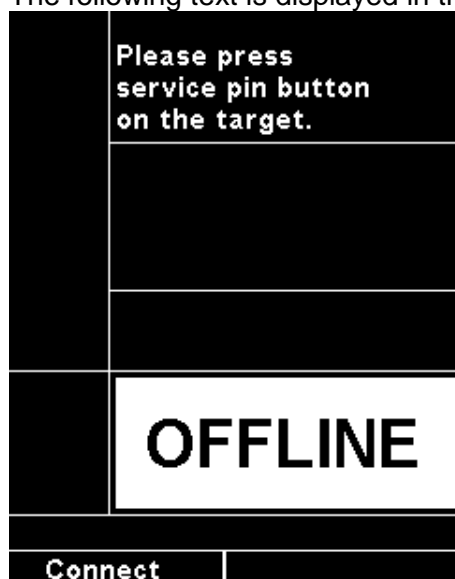The following text is displayed in the list window:



*Figure 5 Connect Target*

Press the Service Pin button  (small round blue button) on the LON Measurement Electronic (LME) System for 1 second and release it again.
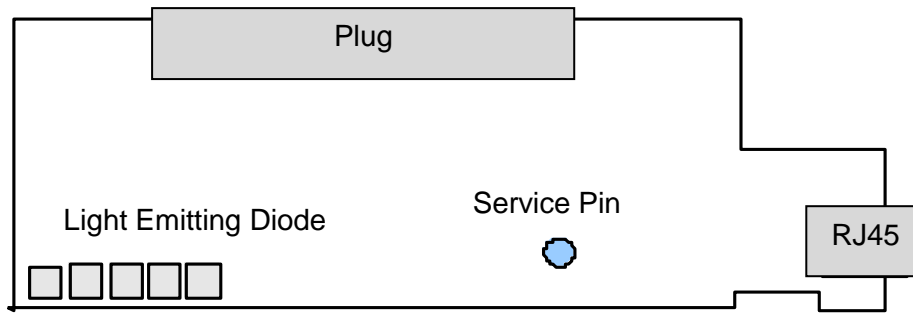


*Figure 6 LON Measurement Electronic System with Service PIN*

The control unit then confirms the successful configuration with a beep and a message in the list window. At the same time the status switches from "OFFLINE" to "STOP".
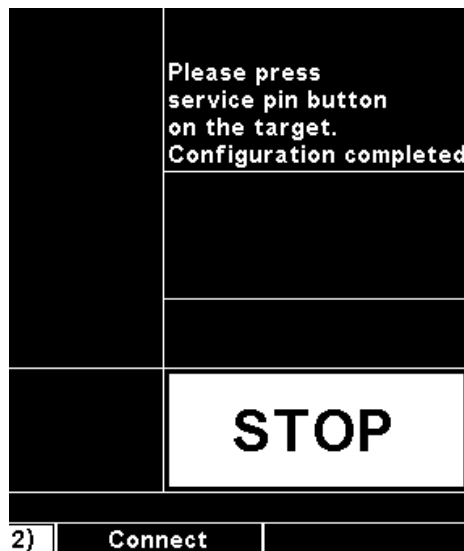


*Figure 7 Target Connected*

## 2.2.1    More than one Control Unit on the same Network

> ➢  If you need to configure several control units, all the subnet addresses of the control units have to be set first. Afterwards connect one lane after another. Please make sure that only one control unit at the time is waiting for the "Service Pin" message.

If there are more than one control units connected to the same network, all subnet addresses of the devices have to be set individually. The lane number (subnet address), which is displayed in the upper left corner of the monitor, has to be unique for all control units.To change or set the lane number (subnet address) choose the following directory via the keyboard menu:

*"\System\Hardware\Control Unit\Set Subnet"*

System ⤸

Hardware ⤸

Control unit ⤸

Set Subnet
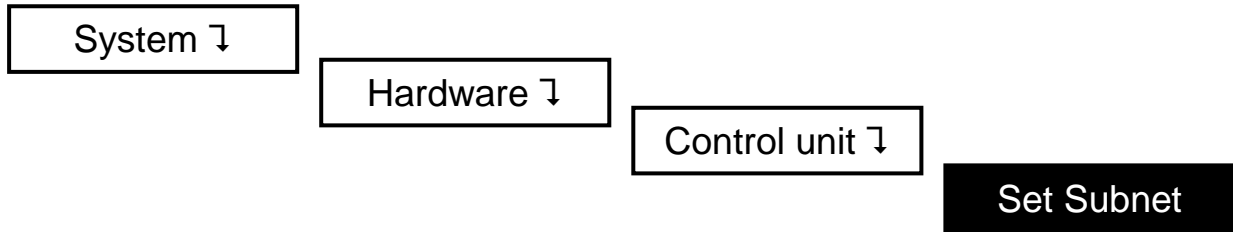
Due to this command, an edit field appears on the LCD of the control unit. The target number (Subnet Address) (can be entered via the membrane keyboard. The target number has to be between 1 and 253. Press the *Enter* key to confirm your input or press the *Esc* key to cancel.

As an alternative to the keyboard, you can enter the subnet addresses by reading the following barcode with the barcode scanner:

| Subnet | Barcode |
|--------|---------|
| 1 | …Hardware\Control Unit\Set Subnet\1..9\1 <br><br> ‖‖‖‖‖‖‖‖‖‖‖‖‖‖ <br> 9 9 0 7 2 7 0 0 0 1 5 8 |
| 2 | …Hardware\ Control Unit\Set Subnet\1..9\2 <br><br> ‖‖‖‖‖‖‖‖‖‖‖‖‖‖ <br> 9 9 0 7 2 7 0 0 0 2 5 5 |
| 3 | …Hardware\ Control Unit\Set Subnet\1..9\3 <br><br> ‖‖‖‖‖‖‖‖‖‖‖‖‖‖ <br> 9 9 0 7 2 7 0 0 0 3 5 2 |
| 4 | …Hardware\ Control Unit\Set Subnet\1..9\4 <br><br> ‖‖‖‖‖‖‖‖‖‖‖‖‖‖ <br> 9 9 0 7 2 7 0 0 0 4 4 9 |

*Table 4 Barcodes set subnet on control unit*

Further barcodes for other subnet addresses can be found in the "*Appendix to the System 7 User Manual*".

## 2.3      Set Language

The most important setting on the control unit is the language. This setting can again be selected by the keyboard or the barcode scanner. This setting can be accessed under:

| System ⌐ |

                   | Settings ⌐ |

                                      | Language (ENG) |

*"\System\Settings\Language"*
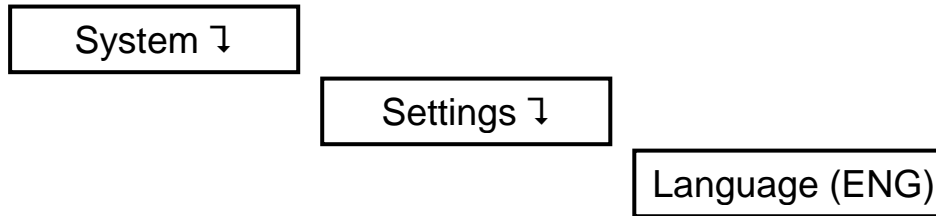
Although there are barcodes to change or set language (to be found in the "*Appendix to the System 7 User Manual")* we do not recommend to use them in connection with the control unit CU941 as there are differences in the implemented languages and their control depending on the software used.
By controlling via the keyboard menu only the available languages can be chosen.

## 2.4    Set Discipline

The complete program and target catalogue with all the corresponding barcodes can be found in the *"Appendix to the System 7 User Manual"*. Four examples are listed here so that the function can be tested:

> ➢ After the power supply has been turned on, it is important to wait one minute before shooting begins so that all the devices are correctly synchronised. (If not, it is possible that shots are marked as illegal.
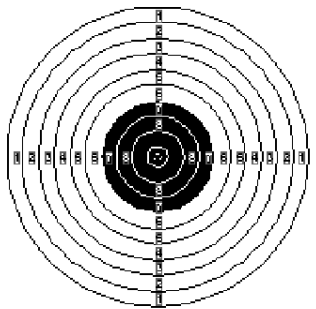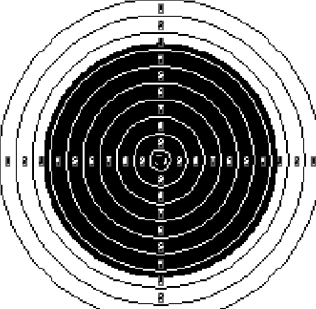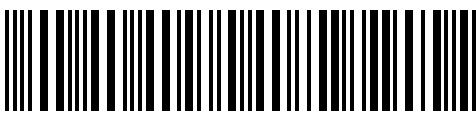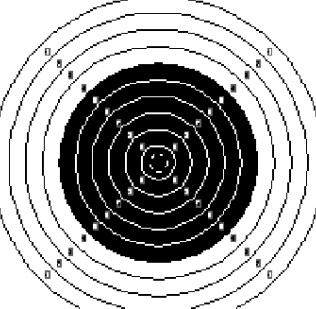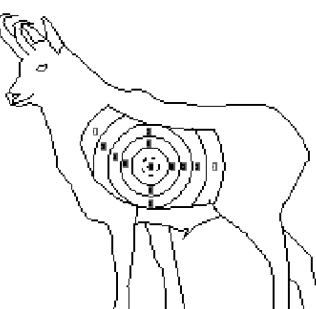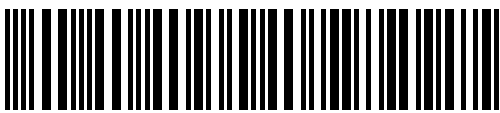
| *Target* | | *Description* | *Barcode* |
|---|---|---|---|
|  | | Example 1: 10m Pistol<br><br>*"\Targets\10m\ISSF\Pistol"*<br><br><br>0 6 0 0 0 0 1 9 0 0 0 2 0 3 5 6 | |
|  | | Example 2: 50m Rifle<br><br>*"\Targets\50m\ISSF\Rifle"*<br><br><br>0 6 0 0 0 0 1 9 0 0 0 3 0 1 5 3 | |
|  | | Example 3: 300m A10<br><br>*"\Targets\300m\ISSF\A10"*<br><br><br>0 6 0 0 0 0 1 9 0 0 0 0 0 2 7 7 | |
|  | | Example 4: Hunting<br><br>*"\Targets\Other\Hunting\Chamois"*<br><br><br>0 6 0 0 0 0 1 9 0 0 0 1 0 8 5 0 | |

*Table 5 Program Examples*

# 3    Display Overview

## 3.1    Screen Layout

Information on shooting in progress is divided into several windows on the control unit.
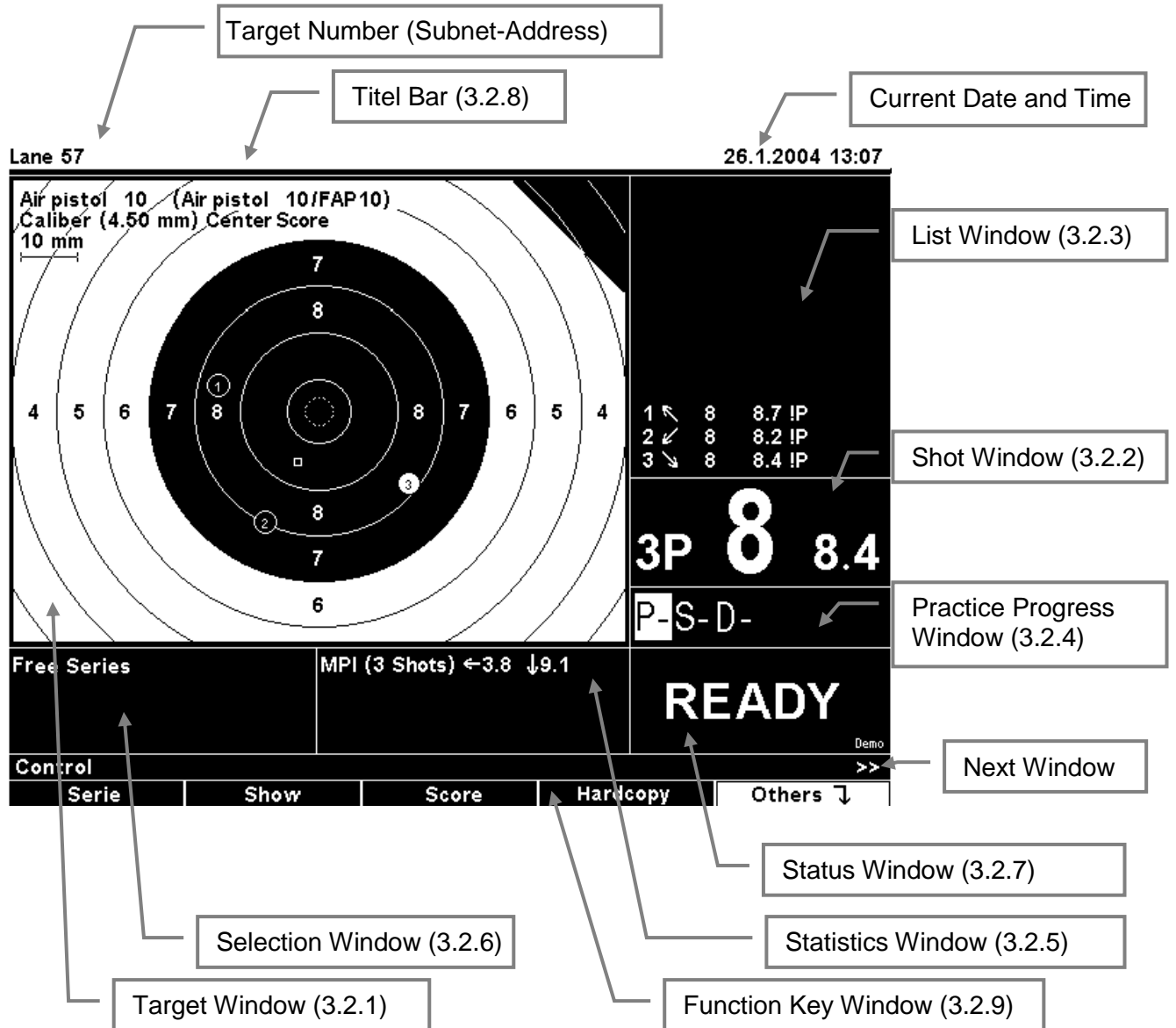


*Figure 8 Screen Layout*

The layout of the screen can be changed in the "Layout" settings. The factory setting is "Classic" display. With the "Stop Left" and "Final" settings, the display layout can be set to the needs of the marksmen and spectators.

## 3.2 Contents of Windows

### 3.2.1 Target Window

The target window shows the target name, the target image, the shooting situation and other status information.
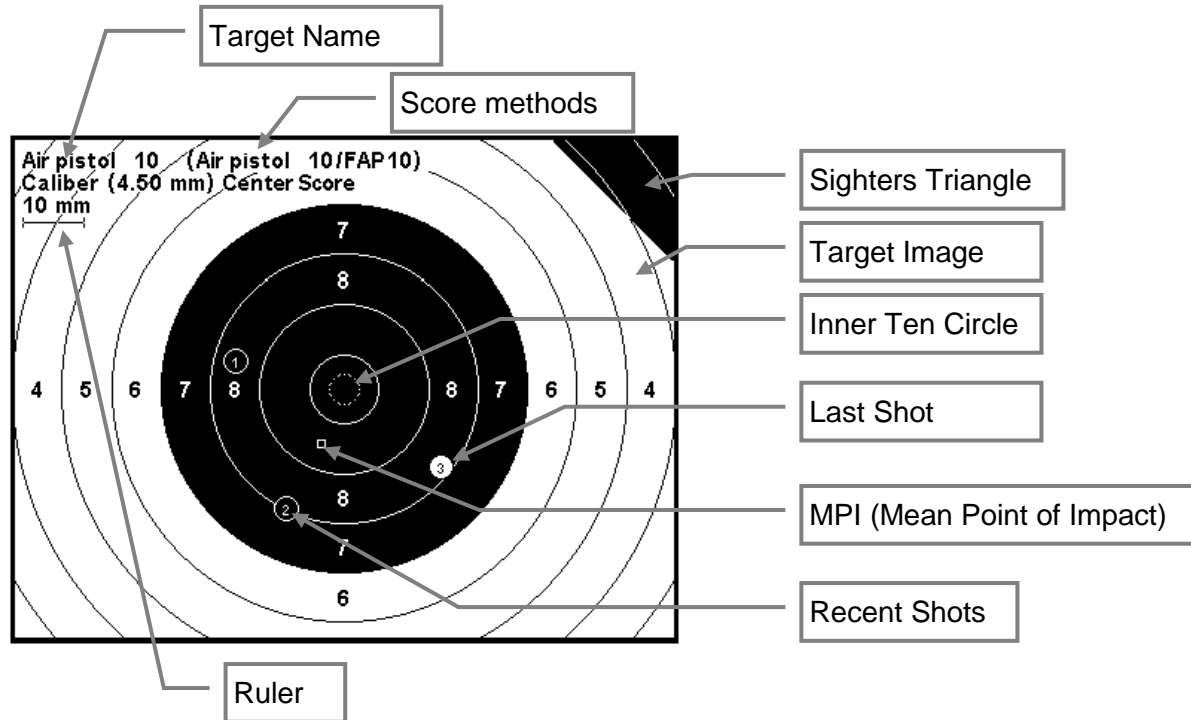


*Figure 9 Target Image*

In brackets to the right of the target name you can see the types of score method(s) (i.e. primary and secondary score; these often correspond to the qualification score in whole tens or the final score in tenths). If, as shown in the example, the calibre information indicates a center score, then the calibre settings have no effect on the shot value. The shot value in these score methods is calculated independently of the calibre which has been set. The display of the target name and the score calculations can be switched off via the settings.

The sighters triangle indicates that the type of fire is set to "Sighters". Shots fired in this fire type are marked with a "P" and are not taken into account for the overall result.

With the *Zoom* key, different zoom levels can be selected. The ruler changes accordingly.

The symbol for the last shot fired can be set independently of the symbol for all other shots. The symbol "Calibre" was selected for both as factory setting. The control unit shows the shot holes true to size, as long as the hole is not below a certain minimum size. On holes that are particularly small (e.g. for 300m distances) a cross is drawn instead of a circle. The last shot fired is shown in inverse colour.

Various parameters such as the "Mean Point of Impact (MPI)", supplement the graphical information in the target window. These parameters are optional and can be turned on or off in the parameter settings.

The "ruler" allows to estimate the target size. This helps to prevent inadvertent shooting at similar looking targets. The depiction of the calibre and of the ruler can be turned on and off in the settings.



*Figure 10 Shot Sensor Symbol and Cross Shot Symbol*

The shot sensor symbol appears in dimmed form in the lower right corner of the target window as soon as a shot sensor is connected. The display changes to the cross shot symbol if in the past seven minutes a cross shot has been fired. Cross shots can only be detected with the connected shot sensors (chapter 6.9 Shot Sensor).

### 3.2.2　Shot Window

In the shot window the last shot fired is displayed in a large font.



*Figure 11 Shot Window*

The number on the left shows the shot number. "P" stands for "sighters shot". The number in the middle is the primary score and the number on the right is the secondary score. In our example it is the 10th ring score. The layout of the shot window can be changed via several setting options.

### 3.2.3   List Window

The list window displays all shots, various totals and other information.



*Figure 12 List Window*

The number on the left shows the shot number. Sighters shots are numbered individually. The arrow shows the shot position from the target centre. The primary and the secondary scores are next. The display of the secondary score is optional and can be suppressed.

The flag on the right of the number 10 shows that it is an inner ten. On the printout the inner ten is marked with "*". The "P" (Probeschuss = Sighters Shot) with the first three shots shows that they were fired as sighters shots.

Shots can have the following attributes.

| *Symbol* | *Meaning* |
|---|---|
|  | Direction |
| (12.2 / -4.8) | Shot coordinates in millimeters |
| 11:33:17.43 | Absolute time in hours: minutes: seconds and $^1/_{100}$ seconds |
| (2.5s) | Relative time from the 1st shot of the group or overtime information on 25 meter disciplines |
|  | Inner ten |
| 97 !P | ! = Demo Shot<br>P = Sighters Shot |
|  | (Frame-Hit) |
| Miss | Miss (shot off signal without shot on; see shot sensor) |

| *Symbol* | *Meaning* |
|---|---|
| Cross Shot | Cross Shot; see (Chapter 6.9 Shot Sensor) |
| ←/→ | Direction (Sweep; Running Target) |
| S / L | Fast/Slow (Running Target) |
| OT | Over Time |
| NAMf | Non-Allowable Malfunction |

*Table 6 Shot Attributes*

### 3.2.4    Progress Window

The Progress Window is visible as an option. It can be turned on or off in the settings.

**P- S5 P- S5 D2**

*Figure 13 Practice Progress Window*

The content of the progress window depends on the chosen discipline. In our example a "pre-programmed discipline" is shown in which the number of shots is fixed. The active group has a white background. The ">>" symbol shows that there are more groups to follow the "D2" group. The display is similar for user programs and for matches. In free program series only three fire types are shown: P (Probe = Sighters), S (Shot by Shot) and D (Deferred). The fire type can be selected optionally and the number of shots is not fixed. See (Chapter 4.4 Program Types)

### 3.2.5    Statistics Window

The Statistics Window shows various information on the current program shot.
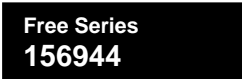
**MPI (5 Shots) ←4.1 ↓4.4**

*Figure 14 Statistic Window*

Depending on the parameters set, the content of the statistics window will change. The "Mean Point of Impact " (MPI)" is shown graphically in the target window and appears as text in the statistics window. The arrows show the position of the MPI and the figures give the distance to the target centre in millimetres. Each parameter has its own form of display. Further explanation can be found under the respective parameters in the *"Appendix to the System 7 User Manual"*.

### 3.2.6    Selection Window

The selection window displays the selected program and full information on the firer.

**Free Series**
**156944**

*Figure 15 Selection Window*

Additionally, information on the position and the weapon can be listed. In the example, the firer number and the selected program are shown.

### 3.2.7    Status Window

The status window shows whether the system is ready for shooting.

**Ready**
                **Demo**

*Figure 16 Status Window*

Several significant statuses are differentiated:

| *Status* | *Meaning* |
|---|---|
| "READY" | A program has been selected. The target has been detected and is ready. The system is ready for shooting. After a system start-up it is important to wait one minute at least before shooting begins. The control units require this time to ensure that all the connected devices are correctly synchronised. ( |
| "STOP" | The control unit has been restarted or the last program has finished. Shooting may neither start nor continue. Shots fired during the stop phase are declared illegal. |
| "SHOW" | A series with several shots has been fired. The shots are now shown one after another. During the show phase no shooting may take place. Shots fired during the show phase are declared illegal. |
| "OFFLINE" | The control unit switches to „OFFLINE" when no target with the correct target number (subnet address) have been identified. Either the target is connected incorrectly or the incorrect target number has been programmed. <br> How to reset the LON Measurement Electronic System to the correct target number is described in (Chapter 2.2 Connect Target) and in the *"Appendix to the System 7 User Manual"* under **"System\Hardware\Target\Connect"**. |
| "PAUSE" | In ISSF programs the system switches on "PAUSE" after each position. The firer can change to the next position with the RC941 (Match Button) or the keyboard. |
| "RECOVERY" | After a power supply interruption the control units restart automatically. If the last program shot has not been ended correctly, then the program that was still open is recovered. The competition can then be continued from where it was interrupted. |

*Table 7 Status Overview*

*The following additional statuses may be displayed in small font:*

| Status | Description |
|---|---|
| "DEMO" | The control unit is in demonstration mode. With the *Ins* key demo shots can be requested from the LON Measurement Electronic System. Demo shots are marked with an exclamation mark "!" on the screen and on the printout. |
| "PRACTICE CONTROL" | The control unit is in a special remote control mode. This mode is used for commanded shooting.<br>In this mode a "PAUSE" status can only be terminated from a central computer. |
| "REMOTE" | The control unit is in remote control mode. It is no longer possible to control the unit via a keyboard or a barcode scanner. |

*Table 8 Status Overview 2*

### 3.2.8    Title Bar

The target number,  the current date and the time are displayed on the title bar. The date format can be modified.

| Line 57 | 7/23/2009  14:43 |
|---|---|
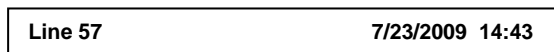
*Figure 17 Titel Bar*

The target number must be between 1 and 253. If several control units are connected in the same network, they must be differentiated by target number.

### 3.2.9    Function Key Bar

The function keys $F_1$ to $F_5$ have different tasks. The keys can be used differently depending on which status the control unit is set to.

| Control | >> |
|---|---|
| Serie | Hardcopy | Others ↴ |

*Figure 18 Funktion Key Bar*

The same information is displayed in the function key window as on the LCD Menu of the keyboard. However, the LCD is limited to four symbols per function key (see the abbreviation glossary in the *"Appendix to the System 7 User Manual"*. The chapter 4.1 Handling describes the navigation through the menu).

# 4    Concepts

## 4.1    Handling

The control unit can be operated in several different ways. Using the keyboard is the most convenient. All functions offered by the control unit can be accessed via the keyboard. The user programs are the only exception as they have to be loaded via a barcode scanner or from the central computer.

Using barcodes offers big advantages, especially for inexperienced users. This way the most important commands can be collected onto one sheet of paper and the handling can be simplified essentially. This helps to prevent mishandling on a range with multiple shooting points.

On major commanded competitions the control units can best be controlled from a central computer. This ensures that all participants operate under the same conditions. Furthermore, a central processor enables efficient data collection.

### 4.1.1    Menu (Using the Keyboard)

The menu has a tree structure. Similar to a modern computer system, all the elements are stored in directories and folders (commands). The root (Home) is in the centre of the menu overview. The different directories branch out from Home. The further the branches extend in the directories, the more detailed the information and commands become.

The complete structure of the menu is printed as an overview in the *"Appendix to the System 7 User Manual"*. This structure also corresponds to the index of barcode descriptions. The following keys are used for navigation within the menu:
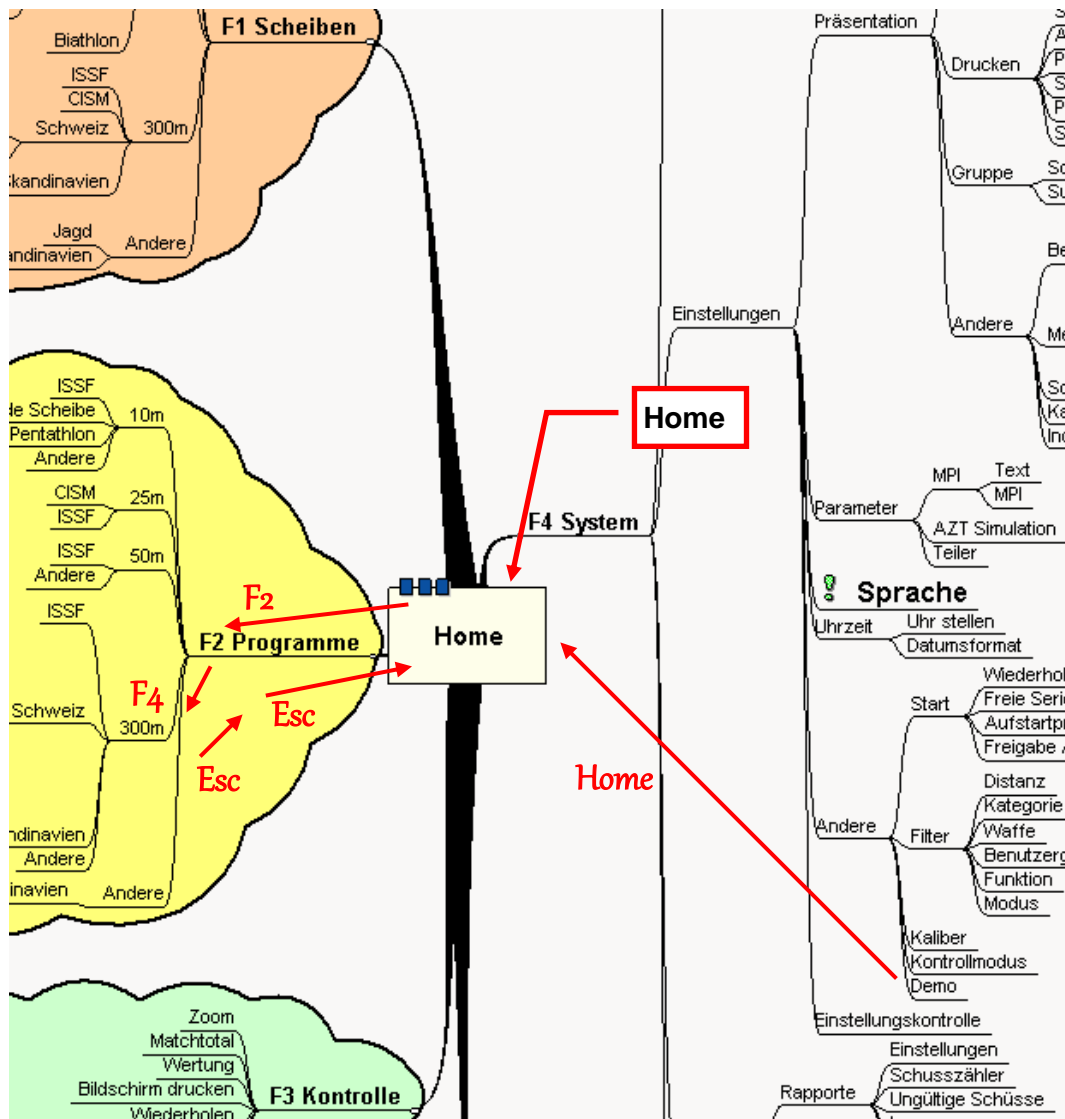
*Figure 19 Menu Navigation*

| Taste | Name | Beschreibung |
|-------|------|--------------|
| *F₁ ... F₅* | Function Key | The function keys allow to go into subdirectories or to carry out commands |
| *Home* | Home | The *Home* key takes you directly back to the Home directory.<br><br>You can also toggle between the Home- and the control directory with the *Home* key. |
| *Esc* | Escape | With the *Esc* key you can exit from a directory and move up one step in the menu. |

| *Opt* | Option | You can return to the last command used via the *Opt* key. Frequently used commands can be accessed very effectively this way. You can go back to the previous menu by pressing the *Opt* key again. You can also press the *Home* key to go back to the Home directory. |
|---|---|---|
| *Help* | Help | By pressing the *Help* key you can display and print out the address and the telephone number of SIUS AG as well as information about the software and hardware versions in use. Please keep this printout on hand if you call SIUS AG for assistance. |
| *Next Window* | Next Window | If there are more than 5 commands available in a menu window (directory), you can access command number six and above by pressing the *Next Window* key. The ">>" symbol is displayed on the screen and in the menu to indicate that there are further commands available. Pressing the *Next Window* key will take you back to the first menu window. |
| *Enter* | Enter | Some settings can be edited with the number keys on the keyboard. For example, the firer number can be inserted via the number keys. These inputs can be confirmed with the *Enter* key or cancelled with the *Esc* key. |
| *UP* " ∧ " | Move Up | Using the *Up* key, the second to last shot in a program that has been shot can be called up once more. In this way all previous shots can be discussed. |
| *Down* " ∨ " | Move Down | The *Down* key takes the discussion in the other direction. |
| *Ins* | Insert | If the system is in Demo Mode (Demo is displayed in a small font on the bottom right of the Status Window), you can then generate demo shots on the target by pressing the *Ins* key. This allows the system to be tested without actual shooting taking place. Demo shots are always marked with "!" in the list window and on the printout. Thus they can be easily distinguished. |

*Table 9 Keyboard Functions*

When a discipline has been selected, the menu switches automatically to the control menu. In the control menu, all the commands which can be called up for the chosen program are immediately available. See (Chapter 4.4 Program Types).

## 4.1.2    Barcodes



*Figure 20 Barcode Scanner*

> ➢ To scan a barcode, put the barcode scanner straight onto the code you want to scan and lift the scanner one to two centimetres. Press the scan button.
> ➢ High quality printouts and copies of the barcodes must be used.
> ➢ The control unit confirms scanned barcodes with different beep signals. One beep means a valid scanned barcode. Two beeps mean that the command has been accepted but it cannot be put into practice or it is not supported. Three beeps indicate a scan error or an illegal barcode.
> ➢ Only barcodes from the *"Appendix to the System 7 User Manual"* or those created by the barcode library can be used. The use of other barcodes can result in a malfunction of the device.

The control unit (the CU941 only) is equipped with a hardware port on the right hand side to connect a barcode scanner. The barcode scanner can carry out all the inputs that can also be made via the keyboard. Moreover, user programs which were previously generated by the computer program barcode library or with SiusData® can also be scanned.

The barcodes are organised in the same way as the keyboard menu of the control unit. All the available barcodes are listed in the *"Appendix to the System 7 User Manual"*. The menu can be used as an additional list of contents.

"Interleave 2 of 5" codes are used as barcodes. The barcodes are protected with a checksum so that scan errors and incorrect codes are automatically filtered.

### 4.1.3    PC

With the SiusData® PC software, all commands can be sent simultaneously to all the control units connected to the same network. Therefore, it is very easy to simultaneously change the same settings for all control units or download a program. Detailed information can be found in the SiusData® documentation.

## 4.2    Settings

The control unit disposes of many setting options which cover almost all customer needs. Everything from language selection via the booting program to the display varieties can be configured. The organisation of the settings is clearly explained in the menu. The following diagram shows how the settings can be managed.
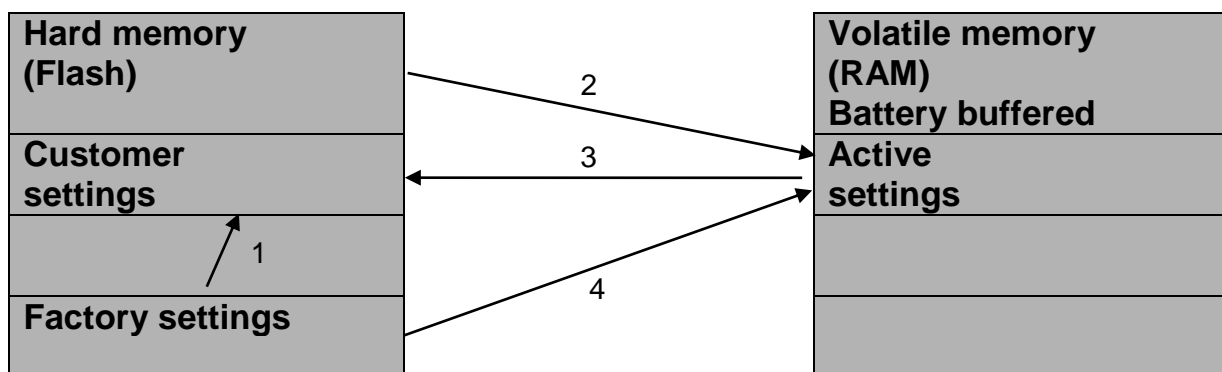


*Figure 21 Settings Management*

1. Before the first use, all customer settings are set to the same value as the factory settings.
2. At the first start-up, (Cold Start), all the customer settings are copied to the active settings. With the command *"\Settings Control\Customer Settings"*, all saved customer settings are copied again to the active settings during use. Changes to the settings which have been made up to this point are reset.
3. With the command *"\Settings Control\Save Customer Settings"*, the active settings are permanently saved to the customer settings.  This function ensures that the control unit restarts in the configuration chosen by the customer even after a battery change.
4. With the command *"\Customer Settings\Factory Settings"*, the active settings are overwritten again by the factory settings. The factory settings are selected so that they are suitable for as many users as possible. The default language is English.

   ➢ The Target/Lane Number (subnet address) of the control unit is not reset to 1 by the factory settings.

## 4.3   Filters

The filter settings are accessible via the following path:
***"\System\Settings\Other\Filter"***:
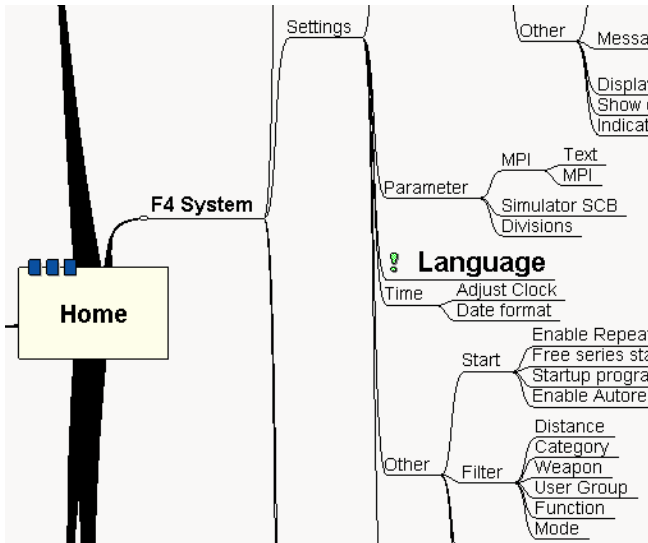


*Figure 22 Filter Settings Path*

The functionality of system 7 is very comprehensive. In contrast to previous versions, System 7 covers several types of installations. It can be used for sport shooting as well as for hunting. Often, a user only wants to use one part of the functionality. The filter functions were developed to be able to restrict the usage via the keyboard (menu) to just this one part necessary.

The filter function can be explained more easily using distances as an example. In the control unit, programs for distances of 10, 25, 50 and 300 metres are available. If a control unit is permanently installed in the 50 metre range, however, it makes no sense for the user to be able to select the 10 metre and 300 metre options as well. A filter makes it possible to filter out the distances which are not needed.

An extract from the menu is shown below in unfiltered format:
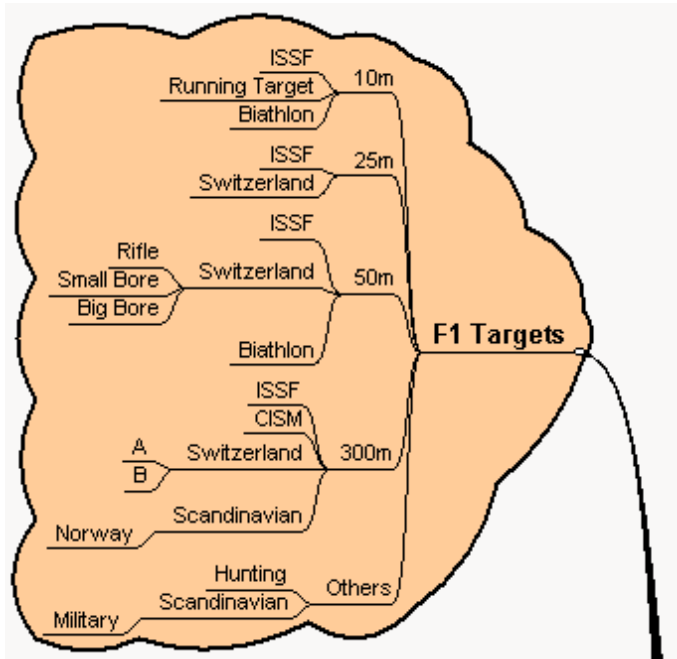


*Figure 23 Unfiltered Menu*

Under the menu path **"\System\Settings\Other\Filter\Distance"** the 50 metre distance can be set explicitly. All other distances are automatically masked. It is also possible to filter out more than one distance. Any unset distances are masked. Thus, the menu in our example is reduced to:
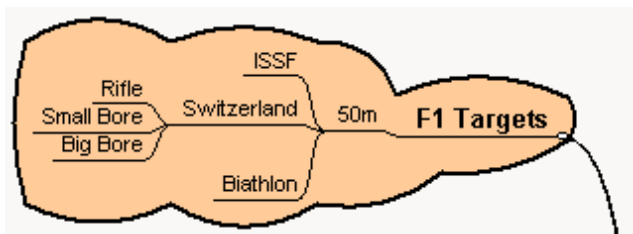


*Figure 24 Filtered Menu*

If you press $F_1$ in the Home directory, you will be taken directly to 50m, because only one single choice is available in the "Targets" directory. Therefore, the 50 metre ISSF programs can be accessed with one button less.

In the same way, other criteria can be filtered: In addition to the distance, the category (ISSF, CISM, SUI, etc.) the weapon type  (air rifle, air pistol, rifle, pistol) and functions group can also be filtered. User groups are also organised via a filter. If the "standard" user group is selected, fewer functions can be used compared to when the "expanded" user group is set. Only the "administrator" can make changes to the hardware configuration and certain analysis functions are reserved for the "SIUS" user group.

The control unit does not provide its own user database as it is common with many computer systems.

## 4.4   Program Types

The programs available in the control unit can be divided into four types.

| Program Typ | Meaning |
|---|---|
| Free Series | A free series can be shot for each target image. |
| Fixed Programs | Frequently used shooting programs are saved as fixed programs. |
| User Programs | With the SIUS barcode library, several outcomes can be programmed for each target picture. These user programs can only be loaded on to the control units with a barcode scanner or via a PC. |
| Match | The official ISSF matches follow additional rules. |

*Table 10 Program Types*

The functions of the specific program types are explained below in more detail.

## 4.4.1    Control Menu

The control menu contains different commands depending on the selected program type and the system status. The most common commands are explained first. An explanation of the individual commands is given under the corresponding program type.

| Command | Function |
|---|---|
| "\Zoom" | The profile of the target graphics is enlarged. |
| "\Print Screen" | If a graphics-capable printer (Thermal Printer D941) is connected to the system, the current screen content can be printed out as a graphic. |
| "\Repeat" | "Repeat" only becomes visible if the program is stopped. The previously selected program can be shot once again using **"Control\Repeat"**. |
| "\Other\Abort" | A running program can be stopped with **"Control\Other\Abort"**. The program is summed up and cannot be continued. An abort occurs as well if a new program is loaded whilst another is running. |
| "\Other\Insert Zero Shot" | For installations without a shot sensor, it can be useful and necessary to manually record any shot as a zero which has totally missed the target. |
| "\Other\Clear Target Window" | The image of all the shots that are represented in the target window is erased. The shots themselves, however, remain in the system and continue to affect the shot result. |
| "\Other\Clear List" | The list window can be cleared manually using this command. The previously printed results remain valid. |

*Table 11 General Control Menu Commands*

## 4.4.2    Targets  (Free Series)

In a free series, the number of shots that should be fired is not fixed in advance. The firer himself can trigger group totals or position totals. Thus, any programs can be shot. The control unit cannot prescribe the procedures however. This type of use is therefore particularly suitable for skilled users who are very familiar with the device and the programs.
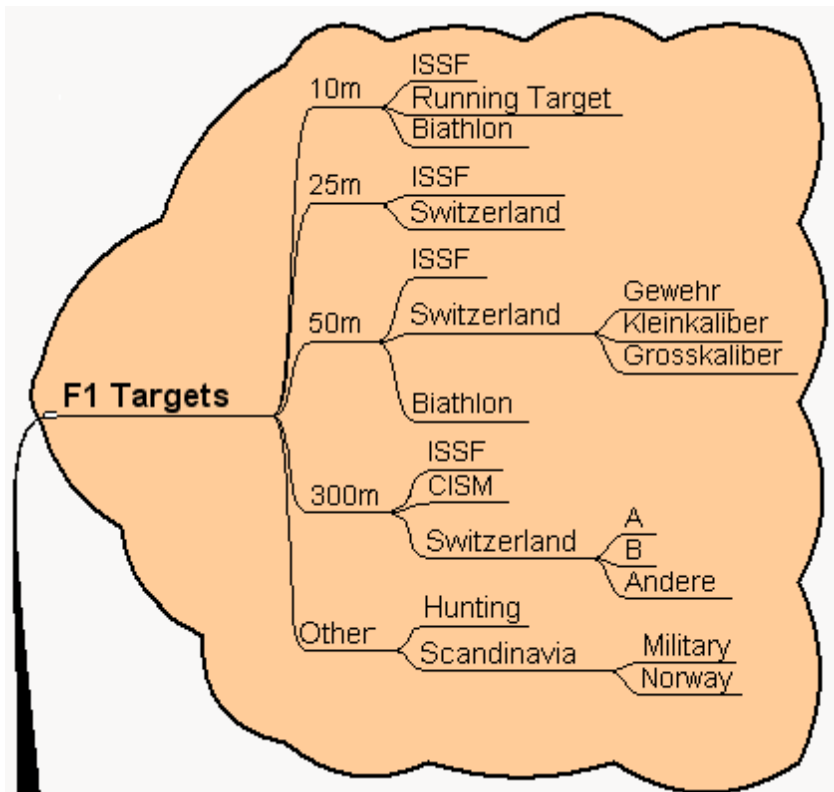
*Figure 25 Free Series*

Free series are selected via the target image. The target images are sorted in the menu according to the distance and the category and like that retrievable. After a free series has been selected, the progress window displays the following:

**P- S-D-**

*Figure 26 Free Series Progress Window*

The three letters stand for the three different fire types that are available. Under "P", sighters shots can be fired. The shot values of sighters shots are not added to the overall total. Pressing the **"\Shot by shot"** key switches over to "S". Shots are shown immediately after each individual shot. In contrast, series shots under "D" (deferred) are only shown when a series group has been concluded or when the "Show" command is explicitly carried out. The hyphen '-' shows that this is an open group. As many shots as desired can be shot.

The following commands can be carried out in a free series:

| *Command* | *Function* |
|---|---|
| **"\Match"** | The match button on the match unit (RC941) switches from "Sighters" to "Shot by Shot", from "Shot by Shot" to "Deferred" and back again to "Sighters". |
| **"\Sighters"** | Each free series starts with sighters shots. Sighters shots are marked with "P". The shot values are not added to the overall total. |
| **"\Shot by Shot"** | A new single shot group can be started using **"\Shot by shot"**. This is also the case if a single group has already been shot. The previous group is summed up and a new group is opened. Thus, a match with 60 shots can be divided up into six groups of ten for example. |
| "\**Total"** **(Practice Total)** | A practice total sums up all the shots since the last practice total or since the start of the program. Therefore, several "Shot by Shot" and/or "Deferred" groups can be added together. Then, shooting can continue. In a position match, the practice total can be used as a position total. |
| "\**TOTAL"** **(Match total)** | The match total sums up all the shots of the program and ends the program that is running. The status window changes to "Stop". |
| "\Deferred" | A new series group can be started using **"\Deferred"**. If this means that a series group in progress will be stopped, this is automatically flagged up before further shooting can take place. |
| **"\Show"** | The shots from a series group that have yet to be shown can be called up from the memory using **"\Show"**. The series group won't be finished automatically. |
| **"\Score"** | In position matches, a one tenth score is usually used for the final. If a secondary score exists for the chosen target image (e.g. one tenth rings), pressing the **"\Score"** command replaces the primary score with that secondary score and the secondary score drops out. By pressing the "Score" command again, this process is reversed. If a shot is fired in one-tenth score in a program, the total is also given with a decimal point. |

| Command | Function |
|---|---|
| **"\Other\"** <br> **Next Primary Score** | The primary score can be changed without affecting the secondary score. There are some target images which have more than two possible score methods. In Germany for example, it is customary to operate with a partial score. If a free series is selected and so a target image, the most common score is selected first. The firer can subsequently select a different score. |
| **"\Other\"** <br> **Next Secondary Score** | Just as the primary score can be altered with **"\Next Primary Score"**, the secondary score can also be altered using **"\Next Secondary Score"**. |

*Table 12 Free Series Control Menu Commands*

> ➢ Alterations to the score method during a running program should be avoided. This creates program totals which are calculated from the various scores.
> ➢ The score methods of a free series must be checked after a recovery process and if necessary corrected.

### 4.4.3 Fixed Programs

Fixed programs are stored permanently. A fixed program prescribes the order of the shooting groups. The control unit ensures that the planned order is adhered to. Fixed programs are widespread in Switzerland particularly. In the first versions of the SIUS scoring systems, only fixed programs were available. The options with fixed programs go way beyond the possibilities of user programs. In a fixed program for example, the exact course of the program, the printout and all other settings can be automatically altered, even during the course of the program. The classic example is the Swiss federal program which prescribes a precise print format. This print format cannot be altered by the user.

The progress window during this fixed program looks like this:

**P- S5P-S5 D2 D3 D5**

*Figure 27 Fixed Program Progress Window*

An open "P" sighters group permits any number of sighters shots. Afterwards, five single "S" shots need to be shown. The federal program will subsequently change the target image from A5 to B4. On the B4 target, sighters shots may be shot again. Thereafter, five single shots are shown individually followed by a 2, a 3 and finally a 5 series deferred. The currently active section of the program is shown in inverse font.

Fixed programs can only be established by SIUS AG. A new fixed program requires a new program version on the control unit.

| Command | Function |
|---|---|
| "\Subtotal" | "\Subtotal" serves to close open groups (the "P" group in the example above) and go to the next group.<br><br>If the last group in a program is an open group, the program can be ended using "\Subtotal". |

*Table 13 Fixed Program Control Menu Commands*

> ➢ Groups in a fixed program cannot be omitted if a fixed number of shots is required. If shooting is taking place without a shot sensor, then it may be necessary to register failed shots manually ("\Other\Insert zero shot").

### 4.4.4   User Programs

User programs can be created with the PC software BarcodeLibrary or in SIUSDATA ®. That way, individual procedures can be defined. It is also possible to compile a user program, in which the target image changes during the course of the program. However, it is not possible to change other settings of the user program via the barcode directly. If a program requires a particular print out, it must be installed separately. User programs can be installed via barcodes from SiusData® or from the keyboard of the user control ("Control\Other\Edit Barcode").

## 4.4.5    Match (ISSF)

A match has a certain basic setup. It consists of one or more positions. In each position, as many sighters shots as desired can be fired before the start of the scoring.
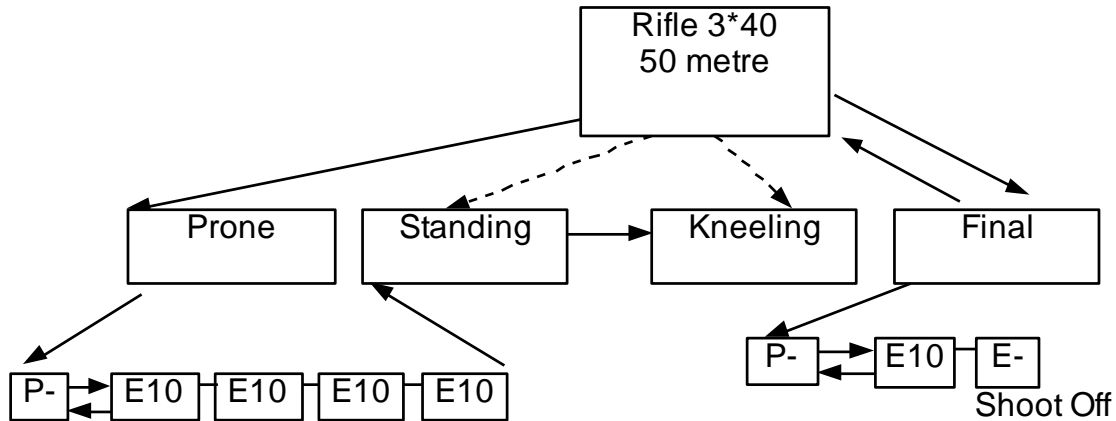


*Figure 28 Match Progress Examples (3*40 Rifle)*

The firer can change individually from sighters shots to scored shots. Provided that he has not fired any scored shots yet, he can also switch back to sighters shots. The scored shots are typically divided into groups of ten. In the event of a weapon malfunction or any other interruption, the firer has the right to fire sighters shots within the scored shots and to subsequently continue with the normal program.

| *Command* | *Function* |
|---|---|
| **"\Practice\Prone"** | Depending on the structure of the chosen match, one of the existing positions can be chosen. A match does not necessarily have to begin with the first position. |
| **"\Practice\Standing"** | |
| **"\Practice\Kneeling"** | |
| **"\Practice\Final"** | The final is treated technically as an own position. Typically, this changes the score to the one-tenth ring. |
| **"\Practice\Sighters"** | During an ongoing match, the "Sighters" menu item appears in the "Practice" directory. During the match, it is possible to switch to exceptional sighters shots using "Sighters". However, this is only permitted in situations which are foreseen in the ISSF rules. After the exceptional sighters shots have been completed, the position which was shot last appears. By choosing this position or pressing the *Match* key on the remote unit (RC941) the user returns to the normal program. |

*Table 14 Match Control Menu Commands*

# 4.5    Special Disciplines: 25 meters

All 25-metre disciplines are pistol disciplines. They are characterised by being time-controlled and by being managed with a light signal and time control units (TCU). Malfunctions are handled according to the detailed ISSF rules. Allowed and non-allowed malfunctions can occur. Depending on the discipline, after such weapon malfunctions the already shot groups will be repeated (standard pistols) or subsequently completed (sport pistols). Additionally, the rules define how the shots to be assesed have to be selected in case of such malfunctions. In 25-metre disciplines, an additional directory entry "**\Control\Malfunction**" appears on the control menu.

## 4.5.1    Centre Fire – and Sport Pistols

For centre fire and sport pistol discipline the following commands have to be used:

| *Command* | *Function* |
|---|---|
| **"\Fill series"** | Not in use |
| **"\Insert zero shot** | Inserts a zero shot if e.g. the target was not hit |
| **"\Allowable"** | Writes an entry in the log (event memory) so that the decision stays traceable. |
| **"\Non-Allowable"** | Writes an entry in the log and completes the series with zero shots (NAM – Non-Allowable Malfunction). |
| **"\Calculate Series"** | Not in use |

*Table 15 Malfunction Center Fire and Sport Pistols*

### 4.5.2    Standard and Rapid Fire Pistols

The following commands are to be used for standard and rapid fire pistols:

| *Command* | *Function* |
|---|---|
| **"\Fill series"** | Must be used if a weapon malfunction occurs on the first shot of a series. The series is filled up and must subsequently be recorded, with one of the following commands, as to whether it was an allowable or non-allowable malfunction. |
| **"\Allowable"** | Writes an entry in the log and causes the last group to be repeated. |
| **"\Non - Allowable"** | Writes an entry in the log (event memory) so that the decision stays traceable. |
| **"\ Calculate Series"** | With "\Calculate Series", a malfunction is closed. The shots in question are demarcated and summed up as the series total. |

*Table 16 Malfunction Standard and Rapid Fire Pistols*

In the rapid fire pistol discipline (RFP – Rapid Fire Pistol) , shots are fired from one spot onto five targets lying close together. The program only needs to be installed on one of the five control units (Master). The four neighbouring lanes (Slaves) are automatically set for the program. The classification into groups of five are effected in the same way. The lanes 1 to 5; 6 to 10; 11 to 15 and so on form each a group.

**Important Note:** During the configuration all lanes have to be set to "Stop". All entries must be served by the master.

## 4.6    Timer

With version 7.3a a timer has been integrated. If active it is displayed in middle of the title bar. The following three possibilities are at hand to configure the timer:

- Control Unit
- PC
- All ISSF-Matches (except 25m-disciplines) incorporate a timer which is activated or disabled through the setting "Programmed Timer".

## 4.7 Communication

The various devices (control unit, LON Measurement Electronic System, SCB and PC) are connected together via a LON field bus. The devices can communicate with each other via this communications network. The LON Measurement Electronic System transmits the raw data to the control unit so that the control unit can calculate the value of shot and enter it correctly into the current program. This is the most important connection. Without communication from the control unit to the LON Measurement Electronic System, shooting cannot be recorded. The control unit communicates a failed connection to the LON Measurement Electronic System with the "OFFLINE" signal.

The control unit communicates in addition to the shots also other information to the Scoreboard (SCB) and above all to the PC, so that the data from all lanes can be collated and evaluated.

To prevent an overload of the network, the network is divided into various segments in larger installations with several lanes. The cabling requirements and the installation of routers are described in the installation and maintenance introduction.

In terms of operation, it is important that the devices can be spoken to via an address which is divided into a subnet address and a node address. The node address is defined by the devices themselves. All devices belonging to one lane must be set to the same subnet address (target number). This happens either via a LNR box (lane number box) and the corresponding rotary switches or by means of settings and programming such as for the control unit (See *"System\Hardware\Control Unit\Subnet"* and *"System\Hardware-\Target\Connect"*).

The devices recognise independently whether the partner being spoken to is present or not. Communication with the SCB is attempted. If the SCB does not respond, the communication channel is reduced to a minimum. If the SCB is turned on subsequently, it can take a couple of minutes before it is recognised by the control unit. The content of the SCB will be correctly incorporated in the following shooting program at the latest.

# 5     Maintenance

## 5.1     Reports

### 5.1.1     Settings

The settings report has been reduced so that only those settings are reported which differ from the factory settings.

```
Settings Target/Lane 57:
Target Changer:
B4        A
Filter (Activated):
Shoot Type:
Free Series
Cardinal:
Demo (On)
Shot Sensor (Off)
Language (English)
Subnet (57)
LongCard:
Shot Number......156944
Weapon Number.......0
Own Shot............0
Cross Shot .........0
Missed Shot.........0
Demo Shot...........8
Invalid Shot........0
Manual O'er.........0
Shot Counter Test...0
String:
Firer Name.........
Nation.............
Reset Date.........26.1. 13:06
```

Report from the CU941 with the Subnet address 57

The B4 target image was reprogrammed to shaft "A" ("B" is the standard)

The "Shoot Type" filter has been activated. A free series has been selected (The shoot type filter is an internal filter witch cannot be altered by the user)

The "Language" setting has been set to English.

The firer number and the shot counter are used as settings. They are not saved as customer settings however.

The firer name and the "Reset Date" of the shot counter are used as text settings. They too are not saved as customer settings.

*Printout 1 Settings Report*

When a control unit is fully set according to the user's wishes, it is useful to print out the settings report and file it. Thus, a control unit that has been repaired or exchanged for example can be reset to the desired configuration.

### 5.1.2    Shot Report

The shot report can be used for settling up. The individual shots are described in detail in the shot report.

```
Shot Report Target/Lane 57:
26.1. 16:50 - 26.1. 17:31
12   Own Shot
1    Cross Shot
2    Missed Shot
8    Demo Shot
0    Invalid shot
1    Manual zero
4    Shot counter Test
```

> Shooting events between 16:50 and 17:31

*Printout 2 Shot Report*

The problems of cross shots and missed shots are discussed in more detail in Chapter 6.9 Shot Sensor and 6.10 Mechanical Shot Counter.

### 5.1.3    Program Settings

In addition to the normal settings reports, the "\Settings\Program" report can be printed under *"\System\Maintenance\Reports\Settings"*. Various programs can affect different settings. The "\Settings\Program" report lists the active settings for the chosen program. It is particularly useful in terms of troubleshooting.

## 5.2 Log

The internal log saves all the incidents which may be needed for documentation purposes and for possible system restoration after an interruption of the power supply. Each incident is detailed on two lines at least. In the top line, the time of the incident is given in hundredths of a second. In the second line, the incident class and a textual description are printed. In case of shots, the coordinates of the shot position are documented in another line.

The most important details of a log printout are explained below:

```
Log Report Target/Lane 57 1-26-2004 16:54:05
Version/Release:
Main
Main V7.1e Final
26.6.2004 13:01
HIC=8002 PIC=606 Lon=2.0b


Size 49152:48
Free 47994
13:06:14.12
DiagnosticE Log erased ()
13:06:16.60
DiagnosticE Monitor started ()
13:07:09.05
Program... Start:Target: 57 (1) Targ
13:07:09.54
Practice...Start:
13:07:09.99
Group..... Start:
13:07:08.72
Shot..... 1 B 8 !P
X: -17.65 Y: 4.76
14:51:19.19
Group..... Stop:
14:51:42.26
Shot..... 1 B 10*!
X: -2.31 Y: 2.55
14:51:42.25
Shot..... 2 C 10 !
X: -4.57 Y: -2.70
14:51:43.69
Shot..... 3 L 10 !
X: -7.32 Y: 0.44
14:51:43.87
Shot..... 4 D 9 !
X: 4.05 Y: -11.24
14:51:54.69
Shot..... 5 C 9 !
X: -10.12 Y: -11.05
14:52:03.38
Group..... Stop:Subtotal 48 Subtotal 48
```

| Annotation |
|---|
| Subnet address of the CU941 and printout time |
| Software- and hardware versions of the CU941 |
| Amount of memory used by the log and the number of log entries. |
| Available log memory |
| Diagnosis entry |
| Program start – produced when the first shot in the program is fired |
| 1st shot event in the program |
| Start of the 2nd group |
| * inner Ten |
| ! Demo Shot |
| X. / Y: Coordinates in millimetres |
| Conclusion of the 2rd group |

*Printout 3 Log Printout*

## 5.3    Target Test

The target test provides software and hardware versions as well as information about the LON Measurement Electronic System which is set to the same target number as the control unit from which the target test is triggered.

```
Target Test Target/Lane 57 28.1.2004 13:39
 HIC=0 TIC=0 PIC=12
 Light Signal=Not connected
 Temperature=27.0 °C
 Version/Release 2.0d
 Mix=0
 Time difference=-60 ms
 Running target=Disconnected
```
*Printout 4 Target Test*

The significance of the various values is explained in the following table:

| *Variable* | *Value* | *Description* |
|---|---|---|
| HIC | | Hardware version of the LON Measurement Electronic System |
| TIC | | Target Index Code |
| | 0 | LON Measurement Electronic System without target |
| | 1 | S10-LON |
| | 2 | S25/50-LON |
| | 3 | 25-LON |
| | 4 | S110-LON |
| | 5 | S310-LON |
| | 6 | S305-LON (boar 100m target) |
| | 7 | Deltabar 100-LON |
| | 8 | Deltabar 128-LON |
| | 9 | S101-LON |
| | 11 | SL12-13 |
| | 12 | VS100 (speed measuring stick) |
| | 22 | |
| | 23 | SL2418 |
| | 129 | LS10 |
| | 130 | HS10 |
| | 131 | HS2550 |
| | 132 | LS10G2 |

| Variable | Value | Description |
|---|---|---|
| MIX | | Mounting Index |
| | 0 | Normal |
| | 3 | Mounted upside down |
| | 5 | Back to front |
| | 7 | Upside down and back to front |

*Table 17 Target Test Data*

The PIC is a hardware version descriptor and "Version\Release" is a software descriptor of the LON Measurement Electronic System. The time difference is measured from that moment the LON Measurement Electronic System has sent the target test to that time the control unit evaluates the target test. A time difference of less than 100 milliseconds is normal. Greater differences indicate an incorrect time synchronisation.

## 5.3.1 New Target Systems HS/LS

With the new targets the target test has been supplemented by the following tasks:

```
Number of poor sensors:  0


Black/white distance statistics:
Average 179.60
Maximum 223.44
Minimum 147.62
```

*Print out 5 Supplemented Target Test for the New Targets*

In case of poor sensors a list names them all. If several adjacent sensors are affected it is possible that a foreign object is located in the detection field. Thus, the detection is disabled.

The black/white distance statistics shows the measuring dynamics of the detection system: the higher the value the better. Direct sunshine or reflections may deteriorate this value. A value of 100 is sufficient for a correct measurement.

The target adjusts itself automatically to alterations of the lighting conditions by dynamically performing different comparisons. Should the target fail in adjusting itself to the given conditions it sends a message to the control unit. Thus, the status of the control unit changes automatically to "OFFLINE". Subsequently, the target restarts and recalibrates. Was this action successful the control unit changes to "READY". As long as the status is "OFFLINE" the target cannot detect any shots.

# 6    Devices

## 6.1    Scoreboard (SCB)



*Figure 29 Scoreboard*

The scoreboard is suitable as a display for spectators, particularly in larger halls. Some installations can display the name, nation and start number of the firer as well as the shot values. Normally the last ten shots are displayed along with the group and position totals as well as the overall total. With System 7, the scoreboards can also be used in free series or user programs.

That the control unit can operate the scoreboard, the scoreboard must be set to the correct target number (subnet address). The target number can be set with the rotary switch at the back of the unit. Only values between 1 and 253 are permitted. The target number is only taken over when the SCB is switched on. After a change of address, the SCB must be switched off and on again.

After an interruption of the power supply to the scoreboard the scoreboard is automatically synchronised with the control unit. Older versions of the SCB software cannot synchronise to the control unit automatically. In that case the control unit has to be restarted after the scoreboard. After it has been switched on, the SCB displays the following three pieces of information on the right hand side:

| Number | Meaning |
|--------|---------|
| 127 | The node address is 127. This is an internal part of the SCB address. |
| 7 | The middle number shows the target number set on the SCB by means of a rotary switch at the back. |
| 103 | The bottom number gives the software version of the SCB. |

*Table 18 Meaning of the Numbers on the SCB after Switching On*

> ➢ That the scoreboard can be used, the following setting **"\System\Hardware\SCB\Active"** must be set at the start of a program. If this setting is turned on during a program, the scoreboard will only be supplied with information from the next program onwards.

## 6.2     LON-Measurement Electronic System (LME)

The LON Measurement Electronic System consists of the following components. The components can be found via the Target Test. (*"\System\Maintenance\Self Test\Target Test"*).

| Component | Version Examples |
|---|---|
| Altera (FPLA) | PIC=12 |
| Hardware | HIC=0 |
| Target code | TIC=0 |
| LON Software | 2.0d |

*Table 19 LON-Measurement Electronic System Components*

The LON Measurement Electronic System must use the same target number (subnet address) as the associated control unit. The target number can be programmed from the control unit. This procedure is described in (Chapter 2.2 Connect Target) or in the *"Appendix to the System 7 User Manual"* under **"\System\Hardware\Target\Connect".**

Alternatively, targets can be fitted with an LNR Box or a LNR Print. In this case, the programming via the control unit is omitted.

## 6.3     LNR-Box (Lane Number Box)

The LON Measurement Electronic System as well as the control unit can, on certain installations, be fitted with LNR Boxes or LNR Prints. A LNR Box or a LNR Print simplifies addressing and thus exchanging of devices.
The LNR Box and the LNR Print supply the devices with a fixed target number (subnet address). Thus, the lane configuration can easily be conducted during the installation and no power supply is necessary on site.

## 6.4     New Target Generation (HS10/LS10/HS2550/LS10G2)

The new targets are constructed a bit differently: though they own a LON-software as well it is only used for communication reasons and has not to be downloaded. The application itself works in the NIOS processor. The actual version can found via *"\System\Maintenance\ Self Test\Target Test".*

| Component | Version Examples |
|---|---|
| PIC=0 | The new targets don't own a FPLA Version, so 0 |
| HIC=0 | Not applicable either, so 0 |
| Target code | TIC=129 |
| NIOS-Software | 3.0a |

*Table 20 Components of the New Target Generation*

The target number has to be set via the switches on the target print for all targets of the new generation. A configuration via service pin does not work.

## 6.4.1 Target Illumination BG-Light (LS10/HS10/LS10G2)

The 10m target is fitted with a target illumination. This illumination can be configured via **("\System\Hardware\Target\Illumination")**.
The list below shows the different commands:

| Befehl | Funktion |
|---|---|
| **"\On"** | Turns the lights on with the chosen intensity. |
| **"\Off"** | Turns the lights off. |
| **"\Brighter"** | Increases the intensity by 5% |
| **"\Darker"** | Decreases the intensity by 5% |
| **"\Set Intensity"** | Allows to set the lighting manually to a certain value. This value can be between 0 and 100%. The default value of illumination is 42%. |

*Table 21 Description of the BG-Light Functions*

The HS10 and the LS10G2 save the set values automatically. These values stay the same after a re-start. The LS10 however, has no internal memory. Thus, the set values get lost after a re-start.

## 6.4.2 Automated Target Elevator ATE10 (LS10/HS10/LS10G2)

If a target is connected with an automated target elevator (10m) this device will be activated automatically in accordance with the fix programmed 10m exercises. However, it is also possible to command the automated target elevator via the menu. You can find the following commands under **("\System\Hardware\Target\Automated Target Elevator")**:

| Befehl | Funktion |
|---|---|
| **"\Standing"** | Moves the ATE to the position "standing" |
| **"\Prone"** | Moves the ATE to the position "prone" |
| **"\Kneeling"** | Moves the ATE to the position "kneeling" |
| **"\Up"** | Moves the ATE upwards |
| **"\Down"** | Moves the ATE downwards |
| **"\Reference Sequence"** | Performs a reference sequence. This is executed automatically at the start-up and every 10 movements approximately. It can be triggered manually in case of displacements of the positions (Standing – Prone – Kneeling) during operation. |

*Table 22 Description of the Automated Target Elevator Functions*

## 6.5        Time Control Unit  (TCU)



*Figure 30 Time Control Unit (TCU)*

The Time Control Unit directs the red and green phases of certain sport disciplines. The proportion between the red and green phases can be individually chosen. The number of phases can also be set. The red/green signal is directly sent to the LON Measurement Electronic System. The LON Measurement Electronic System marks its shot reports to the control unit with the corresponding information. The control unit decides on the basis of the program whether the shots are valued or not.

> ➢ The cabling should be handled with care as incorrect wiring can damage the control units!

## 6.6        Computer (PC)

A customary PC can be connected to the LON network via an "LON Dongle". There are several software products available which have been developed for the use with control units.

| Product | Area of Uset |
|---|---|
| Barcode Library | Setting user programs. Catalogue of barcodes for the control unit. |
| SIUSDATA® | Collecting shot results from several lanes, controlling and overseeing a competition and setting user programs. |
| SIUSRANK® | Start and ranking program for international competitions |
| SIUSLoader ® | Software Update Programme for all SIUS devices |
| SIUSLANE® | Control unit software for the use of a detection system. |
| SIUS 10 LANE COMMAND DESK® CD10L | Print and display programme |

*Table 23 PC-Software Overview*

# 6.7 Printers (D112)

Print rolls that are perforated in the middle are available for the thermal printer D112. With the two column print format, double printouts can be produced directly.

## 6.7.1 Self Test

An internal self test can be launched by holding down the *LF* key (Line Feed) while the power supply is switched on. The quickest way to check the connection from the control unit to the

printer is to press the *Help* key on the control unit. The telephone numbers for SIUS AG and the current programme versions are displayed on the printer. It is possible to use both printers at the same time

## 6.7.2 Data Buffer

Each printer stores the data that is yet to be printed in a data buffer. When the printer is switched on but has been turned "OFFLINE" due to a paper jam or for any other reason, the data buffer continues to fill with data until it is possible to print again. The data buffer is set to store approximately 500 lines of text. If the printer is unable to take any texts for a longer period of time, data is lost. The data buffer is cleared immediately when the printer is switched off. This does not affect the entries made in the internal log. Thanks to the internal log, a failed program printout can be created again using the ***"\System\Reports\Reprint"*** command.

# 6.8 Barcode Scanner (BCR Reader)

See (Chapter 4.1.2 Barcodes)

## 6.9 Control Unit (CU941, Control Unit, Handheld, ME)



*Figure 31 CU941 Control Unit*

The control unit (CU941 or FPE06) contains the main data processor for each electronic scoring system. Various software programs exist (System 7, USA versions) which can be loaded onto these devices. The use of the "System 7" version is described in this user manual. Other software versions are not explained in this manual.

### 6.9.1 Components

| *Component* | *Version Examples* |
|---|---|
| Print (Print Panel) | Rev3 |
| Altera (FPLA) | PIC606 |
| Hardware | HIC8002 |
| LON Software | 2.0b |
| ME-Software | System V7.0i |
| Bootstrap-Loader | 1.0e |

*Table 24 Control Unit Components*

The Bootstrap Loader Software and the Control Unit Software can be loaded with the SIUS Loader® PC Software. The Altera version can be altered by changing an integrated circuit chip. The LON-Software varies depending on the chip set used. That's why it only can be loaded by SIUS AG.

The above information is printed out on the connected printer by pressing the *Help* key.

### 6.9.2 Start-up Functions

| *Start-up Option* | *Description* |
|---|---|
| Cold Start | A cold start occurs when the contents of the volatile memory (RAM) are lost. This happens when the buffer battery can no longer supply sufficient power to the control unit.<br>A cold start can be forced by pressing the reset button at the back of the control unit with a sharp object (with a paperclip for example) when switching on. The reset button is located inside the case. It can be reached via the upper of the two small round openings next to the video socket (This button cannot be reached on the handheld version because it has a waterproof casing).<br>During a cold start, the settings are reset to the customer settings and the contents of the log are erased. |
| Warm Start | A warm start is carried out when the contents of the volatile memory (RAM) have not been lost.<br>During a warm start no settings are changed. The control unit will reproduce any unconsumed programs with the "Recovery" function. |

*Table 25 Start-up Options*

## 6.10   Shot Sensor (SAB, C88)



*Figure 32 Shot Sensor*

The shot sensor for the control unit recognises cross shots (shots from the neighbouring lane onto the own target). The shot sensor informs the control unit when a shot has been fired from a weapon. This message opens a time window. Within this time window, a "Shot On" report must be received from the target. If this message is not received, the firer has not hit his own target and receives a shot with the "Missed" comment. If a "Shot On" message is received without a "Shot Off" having previously been detected, a neighbouring firer has fired on your lane. Such a shot is known as a "Cross Shot" and is displayed in the target window with the cross shot symbol.

The shot sensor is an optional device. It is automatically recognised if it is plugged into the control unit. When it is unplugged, the control unit will work automatically without a shot sensor after a short period of time. A symbol in the target window indicates that a shot sensor is connected. See (Chapter 3.2.1 Display Overview – Target Window).

## 6.11 Mechanical Shot Counter
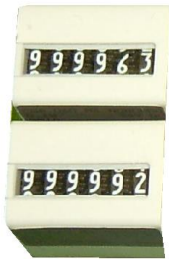


*Figure 33 Mechanical Shot Counter*

The mechanical shot counter is designed that the maintenance can be carried out optimally. The mechanical shot counter counts the number of shots fired per target. This enables the wear and tear on the rubber targets to be calculated. As frequent calculations on the number of fired shots have to be made, the precise functioning of the shot counter is important. The following table shows which shot incidents are counted and those which are not taken into consideration (See *"\System\Reports\Shot Counter"*).

| Shot sensor configuration ("-" = Off; "X" = On) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Shot Off Signal (optional shot sensor on control unit) | | | | | | |
| | | Shot On Signal (LON Measurement Electronic System) | | | | | |
| | | | Mechanical Shot Counter | | | | |
| | | | | Ownshot | | | |
| | | | | | Cross Shot | | |
| | | | | | | Missed Shot | |
| | | | | | | | Remark |
| - | - | - | - | - | - | - | No shot |
| - | - | X | X | X | - | - | Valid shot without shot sensor |
| - | X | - | -[a] | - | - | - | Shot sensor is switched off but reacts nonetheless |
| - | X | X | X | X | - | - | Shot sensor is switched off but reacts nonetheless |
| X | - | - | - | - | - | - | No shot |
| X | - | X | -[b] | - | X | - | Shot on without shot off → cross shot |
| X | X | - | X | X | - | X | Shot off without shot on → missed shot |
| X | X | X | X | X | - | - | Valid shot with shot sensor |
| Signal | | | Effect | | | | |

*Table 26 Shot Occurences and their Effect*

## Neighbouring Targets

If a shot is fired from a target with a shot sensor to a target without a shot sensor, the shot is counted on both lanes.

## Illegal Shot

Whether a shot is marked as illegal has nothing to do with the detection of the shot. A shot is illegal if no exercise has yet been started or when further shooting takes place after a completed exercise ("STOP", "SHOW", "PAUSE" phases).

## Demo Shot

A demo shot is triggered by the *Ins* key provided the equipment is set to "Demo". Demo shots are requested by the LON Measurement Electronic System (from software version 1.2f onwards, demo shots are already recognised as such by the LON Measurement Electronic System in the communications bundle). Demo shots are counted separately. They do not trigger a counting impulse on the mechanical shot counter.

---

[a] When the shot sensor is switched off, a Shot-Off signal does not trigger a counting impulse (mechanical shot counter). This prevents crosstalk from the shot sensor of a foreign target being included in counting.

[b] For possible shot calculations, it is better if the Shot-Off and not the Shot-On are counted. When the shot sensor is working correctly the number of fired shots can be read directly off the shot counter. The shots can be evaluated even better with the shot report (**"\System\Reports\Shot Counter"**). For maintenance purposes, cross shots are counted as having hit the wrong target, in accordance with the above model. The number of cross shots is small however.

## 6.12    Remot Control  (RC941, RC-ZOOM)



*Figure 34 Remote Control (RC941)*

The Remote Control RC941 can be connected to the control unit. It is intended for the firer to be able to give the most important commands without having to leave position. A simpler version is the RC-ZOOM add-on device. This device has only a *Zoom* key.

### 6.12.1    Zoom Key (Enter)

The *Zoom* key enables the outline of the target to be enlarged, as previously described in the chapter "Usage".

## 6.12.2　Menu Key

If the **"\System\Hardware\RC941\Match Menu"** setting is turned on, the *Menu* key enables the "control menu" to be shown as a list window directly on the monitor.
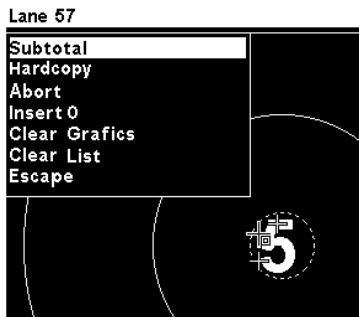


*Figure 35 Match-Menü*

The *Menu* and *Match* keys enable the selection in this window to be moved upwards and

downwards. When the correct command has been selected, the *Enter* key (*Zoom* key) can be used to confirm the command. If no action shall take place, the "Cancel" command must be carried out. The menu is immediately faded out if any other occurrence (e.g. a shot or an error message) takes place.

## 6.12.3　Match Key

In addition to the navigation functions described above, the *Match* key has a particular

function during an ISSF position match. Pressing the *Match* key enables the firer to switch from sighters to match individually. He can switch back to sighters provided he has not yet started shooting in the match. This function can be carried out via the RC941 (remote control) or via the control unit. After exceptional sighting shots, the firer can return to the

usual program via the *Match* key. In free series, the *Match* key can be used to scroll through the types of fire.

# 7      Appendix

## 7.1     Separate Document

The menu with the abbreviations which appear on the LCD, as well as the detailed description of all barcodes, are to be found in a separate document, the "*Appendix to the System 7 User Manual*".
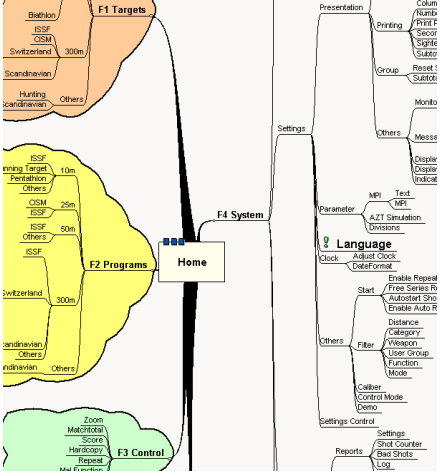
| *Content* | *Extract* |
|---|---|
| Menu |  |
| Abbreviations |  |
| Barcodes with description |  |

*Table 27 Contents of "Appendix to the System 7 User Manual""*

## 7.2     Frequently Asked Questions (FAQ)

- **Why can a particular command or a particular directory not be accessed via the menu?**
  *The use of filters can mask menu areas. Ensure that you have set your filters for your own requirements.*

- **How can the installation be checked?**
  *In Demo mode, shots can be requested from the LON Measurement Electronic System by means of the **Insert** key. In this way, communication to the LON Measurement Electronic System and the functioning of the control unit are largely tested. Demo mode can be turned on and off under **"\System\Settings\Other\Demo"**. The current setting is shown in the status window.*

- **The control unit remains on "OFFLINE" and shots are not shown in the program that is switched on. What is to do?**
  *The control unit cannot communicate with the LON Measurement Electronic System. Check the power supply to the LON Measurement Electronic System and the target number configuration. Check the wiring and reconnect the LON Measurement Electronic System (Chapter 2.2 Connect Target) if necessary.*

- **The control unit always starts up in English.**
  *The settings, including language selection, are saved even when the power supply is interrupted. They are only lost if the buffer battery is insufficient. The control unit shows this in the list window after the start-up process and reports during the start-up process by three beeps. Check the buffer battery and replace it if necessary. Save your settings as customer settings.*

- **How can commanded shooting be controlled from one shooting stand?**
  *The control units can be remotely controlled with the SIUSDATA® PC software. All connected control units can be controlled and configured using this software.*

## 7.3     Short Explanations

| *Item* | *Description* |
|---|---|
| Control Unit<br>CU941 / Handheld | The control unit contains the computer system of a SIUS electronic scoring system. The number 941 indicates the generation of the unit. |
| Cross Shot | If a firer shoots onto a neighbouring target, a cross shot can be indicated on the neighbouring target. A Miss (0'er) is printed on the own target. This recognition only operates in connection with a shot sensor. |
| Foreign Shot | See Cross Shot |
| Free Series | In the main "Target" directory, all the available target images can be selected. This not only selects the target image but also a free series with this image. A free series is a flexible program type. |
| Group | A group is a program unit which contains a number of shots that must all be shot with the same type of fire. A program usually consists of several groups. A program usually begins with a group for sighters shots, followed by one or several groups. |
| LME | See LON Measurement Electronic System. |
| LON Measurement Electronic System | Print plate which is inserted into prior detection systems (S300/S2550/S101 etc.) |
| Match | A match is a shooting program which runs according to certain rules. The match is used particularly in ISSF disciplines. A match permits various positions and the individual use of sighters shots before each of these positions. |
| ME | Measuring Electronics; old synonym for control unit. |
| Passe | Passe is a term used in Switzerland and is another term for "Group". |
| Program | See Shooting Program. |
| Target Error | See Cross Shot. |
| Target Number | See Subnet Address. |
| Shooting Program | Generic term for "Free Series", "Fixed Program", "User Program" and "Match". |
| Short Introduction | A short introduction was created as a separate document. Various short introductions exist for the most important programs and commands for various standard configurations. |
| Stich | "Stich" is a term used particularly in Switzerland and is another term for "Shooting program". |

| Item | Description |
|------|-------------|
| Subnet Address | The subnet address of all components on one line (lane, "target") must all be set to the same subnet address so that the devices can communicate with each other. The subnet addresses are usually the same as the target numbers. |
| User Program | A user program is a shooting program which can only be installed using a barcode scanner. With the products "Barcode Library" and "SiusData®", individual user programs can be installed and printed out. The target image and the program progress can be set with a user program. |

*Table 28 Short Explanations*

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# Index of Printouts

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# Index of Key Terms