

User manual for ML2000

Use of ML2000

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4 Use of ML2000

This chapter describes how to operate the ML2000 system during ordinary use. This includes:

- How to operate the components (targets, connections, cabinets etc.)
- How to use the display unit for simple practice
- How to use the system for more advance operations

There are other chapters with information about:

- Configuring the system after moving or replacing units
- Using the system with PC software (for competition)
- Maintaining the system

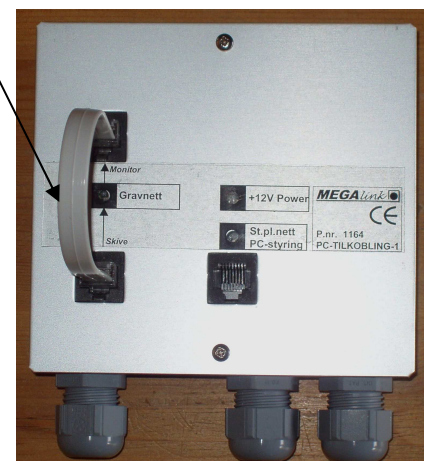
4.1 Operation

NB! The description under is intended for a standard system. Since there are local variations in installation and use, you should follow procedures issued by the system responsible for your range.

4.1.1 Before shooting

The following procedure should be followed (if relevant) before shooting starts:

- Set up the targets and connect the target cables (this is often permanently set up)
- Connect power and communication with the short white cable in the target connection cabinet
- The power supply on the shooting stand should be connected
- Connect the target network by connecting both ends of the short white cable in the PC-connection box
- Connect and turn on all the display units that are needed
NB! Remember always to turn on the master display (usually lane 1)
- Check and if necessary change the display configuration. The following options are essential:
 - Target type
 - Sensitivity (big bore, small bore and air weapon)
 - Parameters for rubber or paper advance (for targets with automatic advance)
 - Select series or single shot marking
 - Shooting program and value system



4.1.2 After shooting

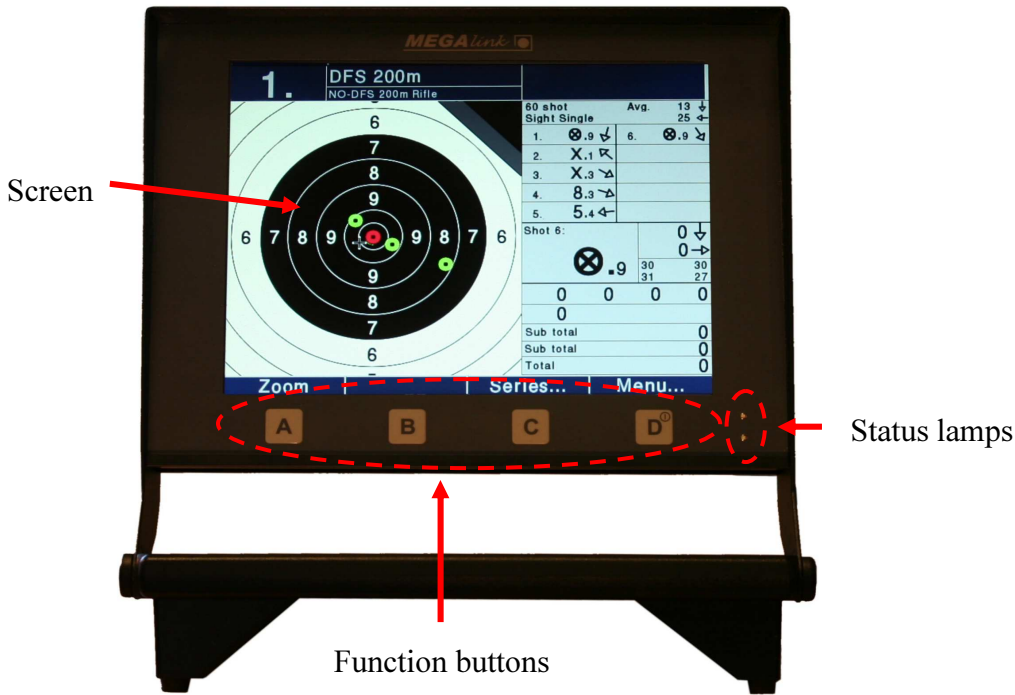
Disconnect the system after shooting. Follow the steps for setting up the system.

NB! Remember to reset options on the displays to ordinary values. This could be of great help for the next user.

NB! Remember to set the displays back to practice mode after a competition!

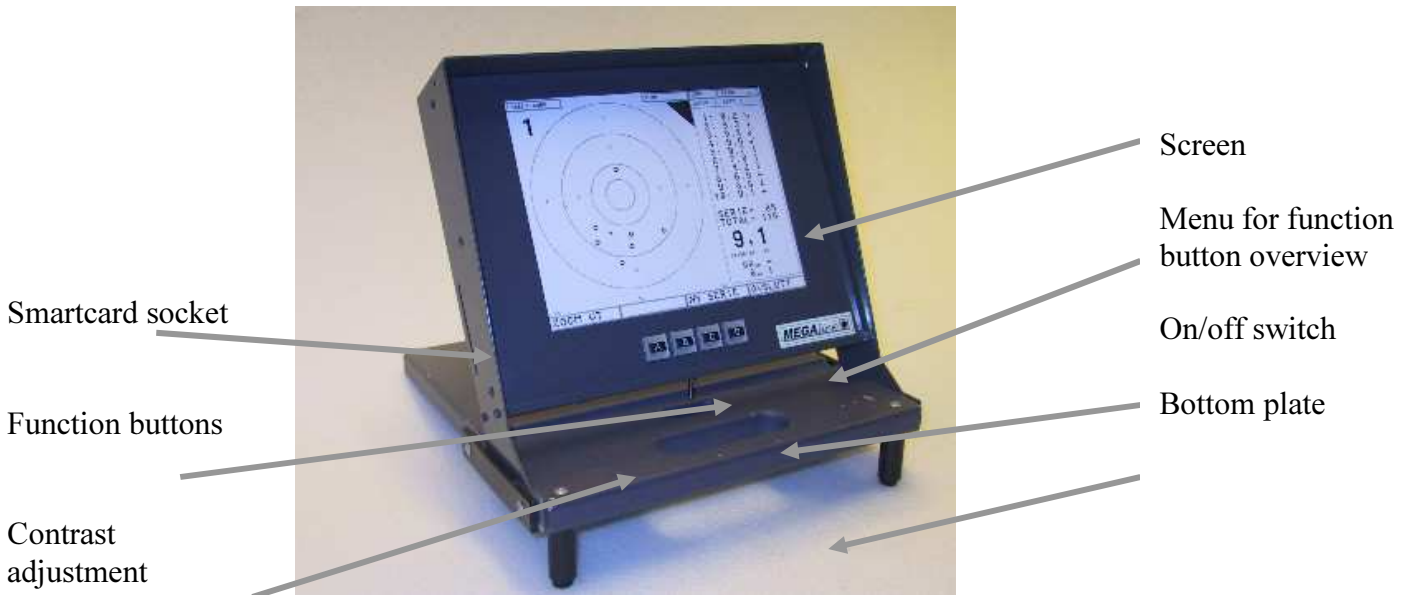
4.2 Practicing on ML2000

4.2.1 Color monitor overview



Sockets for smartcard and accessories is inset on the rear of the unit.

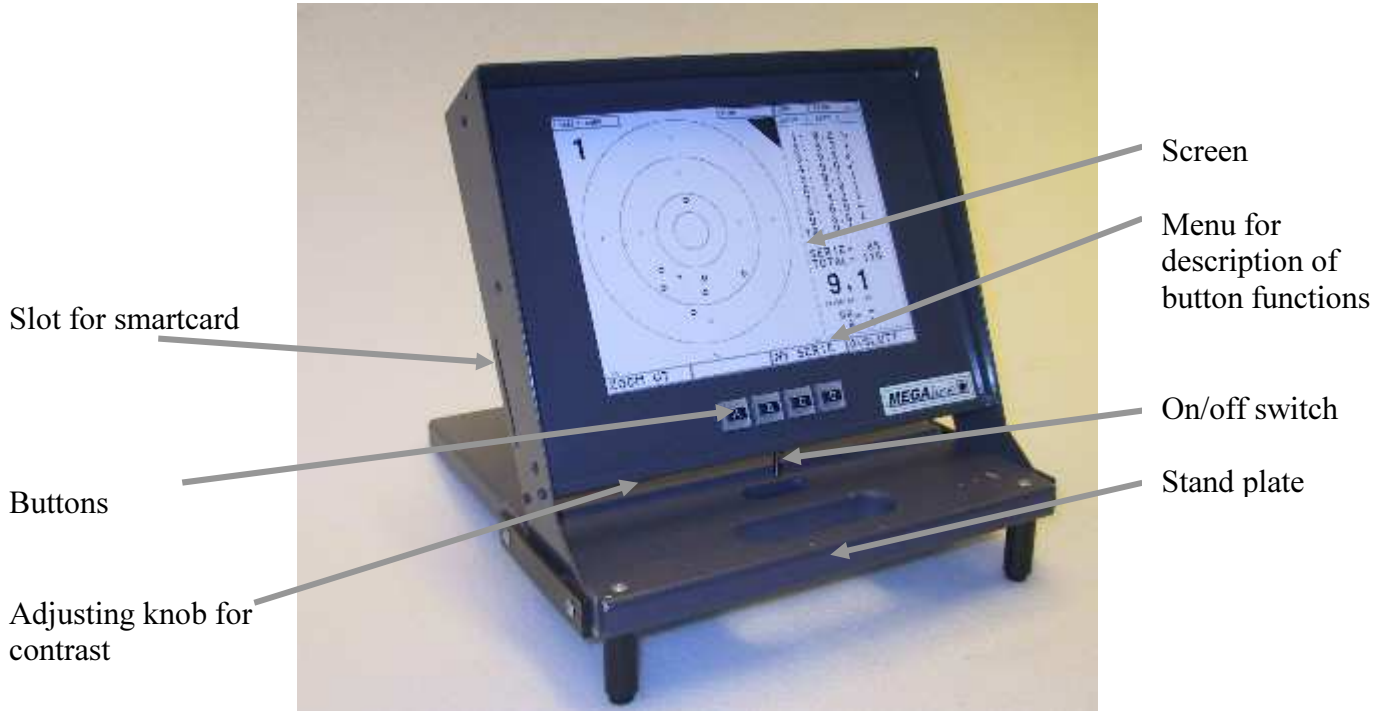
4.2.2 Black/White monitor overview



The display unit is operated as follows:

1. Set up the monitor by twisting the stand plate approximately 120 degrees. Place the display on the shooting stand as shown on the picture below. Adjust the display angle according to user needs. After use the stand plate should be folded back to protect the display during transport and storage.

2. Connection is done with the cable in the pocket on the back of the display unit. The cable is connected in any (within a segment) of the connectors at the front of the shooting stand.
3. Switch on the unit with the switch at the bottom end of the monitor box. The display unit can be connected and disconnected regardless of the switch position.
4. If needed the contrast can be adjusted with the knob at the bottom of the monitor box
5. Operate the menus with the four buttons at the lower part of the front of monitor box. The buttons are marked A, B, C and D and maps to respective menu functions in the lower part of the LCD screen.



Over each function button (A, B, C, D) is displayed a function name. These will change depending on which page is displayed.

For example, button A is used to zoom in and out of the displayed target.

Button D opens the main menu..

4.2.3 Preparation

- When the display unit is switched on, the main menu screen is displayed (except when the display is controlled by the range management PC)
- In the middle of the upper line on the screen there is an indicator for the system status. This indicator should be in READY state before shooting. If the indicator is in WAIT or ERROR there is no use in trying to shoot. When the unit is ready the temperature and shot count on this lane will also be displayed on this screen
- The main menu screen will also present which target type the display is set up to use. Verify this selection and change if needed as described later in this chapter.
- Start with creating a new shooting card. Select the menu function **NEW CARD** (button D). On the next screen you will be asked to confirm the creation of a new card – answer with **YES**. If the current card is empty you will get a message about this and confirms with pressing **OK**

- For practice we recommend to use single shot marking. A description of how to change this follows later in this chapter

4.2.4 Shooting

- Select the function **SHOOT** on the main menu. You will then get a screen with the shooting target. In the upper left corner you can see the lane number. In the area up and to the right of the target you will see a black triangle for sighting series. The black triangle disappears when match series are selected.
- If the display is set up with single shot marking the shots will now be presented immediately after firing. If the **MARK** function is present at the B button, the system has been set up with series marking. In this case, the shots are not marked until this button is pressed.
- When a series is finished you can select **NEXT SERIES**. The next screen will then provide a list of series to move to. The system will automatically select the next series so you in most situations can press **FINISHED**. Advanced use of this function is described in connection with target lift and turning target system later in this chapter.

4.2.5 Description of marking

- The last shot is displayed with a flashing ring. The flashing ring indicates the size of the gauge if possible. If you are using large targets (e.g. 300m) the gauge will be too small to be easily visible on the screen. In this case the flashing ring will be approximately 3,, in diameter on the screen.
- The other shots are always displayed with a solid fat ring of about 3mm in diameter. The ring indicates the centre of the shot. In this way it is easy to see the exact position of the shots and at the same time see the scattering pattern for even the smallest targets.
- Shot number, the shot value (in 1/10 value) and the main direction of the shot is displayed to the right of the target picture. When using run counters (for running target) the shot number represents the run number. If silhouette shooting is selected for turning targets, the number represents which target within the segment the shot was detected on.
- The value of the last shot (the flashing shot) is displayed with large digits in the lower right area of the screen.
- With single shot marking the lower right area is also used to display the exact position of the shot (in mm or 1/100 mm dependent on setup). For series marking the area is used to display the position of the arithmetic mean for the shots. For turning targets this field displays the time (in 1/10 second) since the last target turning.
- The arithmetic mean for the shot positions in a series is displayed with a small cross on the target picture.
- To the right of the target and a little below the middle of the screen you will find the sum of the shots for the series and the total for the card. The total value is counting only match series and not sighting shots. The total will not reflect the maximum number for shots for the series in the program. The total will therefore be too high if the shot count is too high.
- The signs for ten and centre ten depends on the selected value system. The Norwegian DFS system uses X for ten and an X with circle around for centre ten. The value system 1-11 uses the value 11 for the centre ten area. Other value systems uses the number 10 as symbol for ten, while a centre ten is additionally marked with a asterisk (*).
- Depending upon the setup the display can remove shots detected in the frame of the target. This is displayed with a special symbol. Shots fired on turned targets will also be displayed with a special symbol. The value in the list of shots will be 0.0.
- The 1/10 value is used to indicate the quality of the shot within the integer value. For most targets the integer values are divided in ten equal zones. The integer value 9 can therefore be any value in the range 9.0 to 9.9. Shots outside 1.0 will be given the value 0.0. The ten and centre ten areas are handled differently on some targets according to regulations in different

organisations and practical considerations. Note in particular that the border between ten and centre ten is independent upon the 1/10 value. In practice the centre ten starts somewhere in the range from 10.2 to 10.5

- Three or four small numbers are displayed below the target picture. These numbers are used to present the sound pressure value detected on the microphones in the target for the current shot (the shot that flashes). The values are used to monitor the tightness of the sound chamber and thereby evaluating the detection quality in the target. Ideally the values should be even and in the range 25-32. The interpretation of the values is described in detail in the chapter about maintenance.



4.3 Shooting programs

The display units contain a system to handle a set of different shooting programs. Select the setup function on the main menu to access the field for program selection.

During shooting the next series will be selected with the function **NEXT SERIES**. In addition to select the next series it is possible to change the series type to variants that are decided by the external equipment. The tables below give an overview of the series available in the different programs. Keep in mind that this information might change in future releases.

NB! The first series is always a sighting series regardless of program and series selection.

4.3.1 Shooting programs

Program	Utstyr	Merknad
Trening 20x10		
Trening 20x10 Heis	Heis	

Trening 3x60		
Trening 3x60 Des		
Trening 3x60 Heis	Heis	
ISSF 40		(1)
ISSF 60		(1)
ISSF 3x20		(1)
ISSF 3x40		(1)
ISSF 60+40+40		
ISSF 60+40+40 Heis	Heis	(1)
ISSF 20+20+20 Heis	Heis med justering	For USA
ISSF Finale		
ISSF Standard	Vendefigur	
VM Program	Vendefigur	
Presisjon	Vendefigur	
Duell	Vendefigur	
Silhuett	Vendefigur hurtig	
Hurtig	Vendefigur	
NSF 15m		
DFS 15m Ligg	Heis automatisk	
DFS 15m Junior/V55	Heis automatisk	
DFS 15m Sen.		
DFS R/ER/1/V65/V73	Heis automatisk	

4.3.2

- When a series with a specific lift position is selected, the lift will start moving to this position at the moment you press **FINISHED** button in the **NEXT SERIES** menu.
- In composite programs the lift will move to the position that matches the number of shots in the given series. For each shot received the system will check if the lift should be moved
- NB! In case of cross fire the lift system will not move correct for composite programs. (this function is therefore not recommended for competitions).

4.3.3 Shooting programs – turning target

Program	Common	Attention!	Green	Red	Repetitions
Silhouette	Yes	3	8	0	1
		3	8	0	1
		3	8	0	1
		3	6	0	1
		3	6	0	1
		3	4	0	1
		3	4	0	1
Silhouette national	Yes	3	10	0	1
		3	10	0	1
		3	10	0	1
		3	8	0	1
		3	8	0	1
		3	6	0	1
		3	6	0	1
Silhouette final	Yes	3	4	0	1
		3	4	0	1
		3	4	0	1
Precision	No	7	300	0	1
		7	300	0	1
		7	300	0	1
		7	300	0	1
		7	300	0	1
		7	300	0	1
		7	300	0	1
Rapid fire	No	7	3	7	5
		7	3	7	5
		7	3	7	5
		7	3	7	5
		7	3	7	5
		7	3	7	5
		7	3	7	5
Standard	No	7	150	0	1
		7	150	0	1
		7	150	0	1
		7	150	0	1
		7	150	0	1
		7	20	0	1
		7	20	0	1
		7	20	0	1
		7	20	0	1
		7	20	0	1
		7	10	0	1
		7	10	0	1
		7	10	0	1
7	10	0	1		
Standard 1/2	No	7	150	0	1
		7	150	0	1
		7	150	0	1
		7	20	0	1
		7	20	0	1

		7	10	0	1
		7	10	0	1
Rapid/CISM	No	7	10	0	1
		7	10	0	1
		7	10	0	1
		7	10	0	1
		7	10	0	1
		7	8	0	1
		7	8	0	1
		7	8	0	1
		7	8	0	1
		7	6	0	1
		7	6	0	1
		7	6	0	1
		7	6	0	1

- All series starts with a command time of 60 seconds. In this period the clock on the shooters display is counting down from 60 to 0. When the period has passed the system start the turning target program as indicated in the table above
- All programs use a “turn time simulation” of 0.3 seconds between green and turned target. In this period shots will be accepted even if the red LED lamp is on.
- When the series is finished the red lamp is on for 20 seconds.
- Shots fired when both lights are off will be accepted
- A yes in the column labelled “Common” is indicating that all shots in the segment will be sent to one display for marking. This is typically used for the silhouette programs. The shots are marked on the display where “new series” was pressed. In PC-controlled mode the marking will be sent to the master monitor.

4.4 Shot cards

4.4.1 Introduction

The shots are automatically stored in the display units. The last 400-1000 shots on the last 9 cards are available. Elder shots or cards are deleted automatically when the space is needed. The functions for using the shot cards are simple but still not required for simple use of the system.

4.4.2 View card

To view shots in the current shot card, the following steps should be followed:

- Select **SHOT CARD** from the main menu, and then select the **VIEW** function
- The next screen is the overview for the shot card. The system automatically displays a plot of the last series on the card. Instead of the usual shot list at the right of the target picture, you will see a compact overview for all the series on this shot card.
- By pressing **NEXT SER** you can select series to be displayed. In the upper right corner you can see an indicators for which series that is currently displayed (e.g. “*MARK 5 SHOOT 7*” means that you are looking at series 5, while new shots will be registered on series 7)
- When you want to have a closer look at a series you can press **DETAILS**. The screen will then be very similar to the ordinary screen when shooting. The screen starts with the last shot flashing. By pressing the **NEXT SHOT** you will advance through the shots in the series. Observe that the sound pressure values are visible for the selected shot.

4.4.3 Print card

This function requires a connected PC with default printer and a running instance of MLLeder.

- Ensure that the PC, printer and MLLeder is ready

- Select **SHOT CARD** from the main menu and then select **PRINT**. Confirm that you want to start the print operation with **YES**
- The display unit will start to send shot values to the PC. When all shots are sent, MLLeder will initiate the print.
- You can cancel a print with **CANCEL**. This can also be done if the transferring of shots to the PC stops.

4.4.4 Select card

Another stored card can be selected as the current card with the following procedure:

- Select **SHOT CARD** from the main menu and then select **SELECT**
- You will see a list of available shot cards. Select the card you want with the **UP** or **DOWN** and confirm the selection with **FINISHED**
- If you selected a new card you have to confirm the change with **YES**.

When you have selected a new shot card, it can be used in exactly the same way as your old card. This means that you can continue shooting, view the card or print the card.

4.5 Ordinary setup

Select **SETUP** from the main menu to enter the menu screen for ordinary setup. The options in this menu are described below. Each of the values can be changed. Move the field marker (single line border) to the wanted field and then press **EDIT**. The field marker changes to a double lined frame. Change the value inside the frame with **+** or **-**. For numbers with more than one digit the **<=** can be used to navigate to the next digit. End the editing with **OK**. The options and legal values are described in the table below:

Field	Description of values
MARK	<input type="checkbox"/> Single shot Each shot are marked immediately after firing <input type="checkbox"/> 10 Single shots Same as Single shot except the system changes series automatically after 10 shot <input type="checkbox"/> Manual The MARK button must be pressed to get marking
MARK TEMPO	<input type="checkbox"/> 0-9 seconds The time interval between shots in manual marking. With 0 seconds all shots are displayed when the MARK button is pressed
ZOOM TO VALUE	<input type="checkbox"/> 1-10 Which value ring to include for the best zoom level
PROGRAM	<input type="checkbox"/> All <input type="checkbox"/> None <input type="checkbox"/> DFS 35 Shots <input type="checkbox"/> Every second <input type="checkbox"/> User defined <input type="checkbox"/> Other programs according to external equipment
MEASUREMENT	<input type="checkbox"/> Arithmetic mean of positions <input type="checkbox"/> Height + Width <input type="checkbox"/> Height and Width The chosen measurement will be used for marking series and at the overview screen in the shot card function

VALUE SYSTEM	<input type="checkbox"/> DFS <input type="checkbox"/> ISSF Integer All sums are calculated with the integer values only <input type="checkbox"/> ISSF Descimal All sums are calculated with the full decimal values <input type="checkbox"/> 1-11 Center ten is valued 11 <input type="checkbox"/> 1/100 This option decides how to present shots and how to calculate sums
CALIBRE TYPE	<input type="checkbox"/> Big bore <input type="checkbox"/> Small bore <input type="checkbox"/> Air weapon <input type="checkbox"/> User defined (not a normal selection) It is important to select the correct value for optimal detection. NB! The value in this field is stored in the target controller unit. After a modification the field will be cleared until a target controller response updates it with the new value. If the field remains cleared it will be a indication of problems with establishing contact with the target.
Motor Frequency	Number of shots before the motor advances the rubber or paper band in targets with automatic advance
Motor Timer	The distance to advance the rubber or paper band in targets with automatic advance. The value is given in 1/10 of a second which corresponds to approximately 0.7mm

4.6 Display unit setup

Ordinary use of the monitor will often not require modifications in the display unit setup. Changing target type and moving equipment between ranges could be reasons to enter this function. Follow these steps to enter the menu:

1. Turn the display unit off
2. Press and hold the A-button while switching on the display again

The values are edited as for the ordinary setup Remember to use **FINISHED** when you have changed the values in order to store the new values.

NB! If you are using non-standard values you should set the system back to a normal state after use. This will help the next shooter!

The values in the display setup menu are described here:

Field	Description of values
Master/Slave	<input type="checkbox"/> Master One display unit should be set up as master per target segment <input type="checkbox"/> Slave All other displays than the master should be configures as SLAVE <input type="checkbox"/> Master A/B This is an alternative master configuration. This value should be used for pistol targets with LED lamps and for ranges with twin targets. NB! Remember to have only one MASTER (or MASTER A/B) per target segment
Lane nr.	Lane number for this display unit
Target group	<input type="checkbox"/> DFS/ DDS/FSR

	<input type="checkbox"/> ISSF <input type="checkbox"/> ANIMAL <input type="checkbox"/> 10-ring circle <input type="checkbox"/> Hit/Miss targets The selection of target type is done in two steps. Select a group first then select the specific target in the next field.
Target type	The list of available targets depends on the selection in the Target Group field
Actual range	This field is used together with the next field to scale the value calculation. If both values are equal there will be no scaling. Selection of target type will set these fields to default values. Example of compensation for a short range: Select Actual range = 294 and Simulated Range = 300. In this case the shot position, gauge and therefore also the values will be recalculated to simulate a normalized range of 300m even if your range is too short.
Simulated range	Refer to the previous field
Gauge	Size of the gauge in 1/100 mm. The value is set to a default value when a target is selected
Decimals in mm	Select the number of decimals in presentation of shot position and measures. We recommend one decimal.
View sound pressure	The sound pressure values are displayed under the target picture if this option is activated. The values are always stored independent of this selection.
Språk Language	Norwegian English
Black aiming	Most of the circular targets will present a picture with black aiming are if this is activated (recommended)
External equipment	<input type="checkbox"/> None <input type="checkbox"/> Turn target (LED lamps for pistol) <input type="checkbox"/> Run counter (for running target) <input type="checkbox"/> Target lift
Remove frame shots	Some targets have a sensor in the frame. Activating this function would automatically remove shots where this sensor has been triggered. The function should not be activated unless the sensor is present and tuned for you kind of shooting.
FIRST LANE	The field is only available for the master. The field should contain the first target the master ins managing (usually the first lane in the target segment)
LAST LANE	Refer to the previous field. This value should be the last lane number in the target segment.

4.7 Smartcard

All new display units are equipped with smartcard reader. The card can be inserted in a slot on the left hand side of the monitor box. The front of the card (with label and chip) should face the shooter.

4.7.1 Card with limited number of shots

4.7.1.1 Activating and deactivating

The display unit can be set up to require a user card to accept shots from the target unit. To activate this function the administration card should be inserted for a few seconds in the monitor. A text with the name of the range is displayed. Deactivation is done in the same way.

When the system is managed with the range management PC the smartcard function is temporarily deactivated.

4.7.1.2 Shooting

The text "INSERT CARD" is displayed on the main menu screen when the smartcard function is activated. In order to use the target the user has to insert a valid user card for the specific range (must match the administration card used to activate the function). When the user card is inserted, the number of shots left in the card will be displayed together with the total number of shots registered on the card.

The display unit now operated completely as normal. For each shot the card will be updated. When all shots in the card have been used, the shots are discarded and the main menu screen is displayed.

4.7.1.3 Issuing and filling user cards

The cards can be issued and filled with shots with a PC program and the administration card.

The user card can be used for 50,000 shots until it has to be reissued.

4.8 Display is locked in PC-controlled mode

If the display has been used with the range management software on PC (for competition) the operator could have forgotten to set the displays back to manual control. In this case the display starts directly in the shooting screen and only the ZOOM button is available. The PC can easily be used to solve this situation, but to do it manually the following procedure should be used:

1. Press and hold the A-button for 5 seconds.
2. Without releasing the A button, press the D button
3. The monitor returns to training mode.

4.9 Simple troubleshooting

The checkpoints below is meaningful only if the system has been operational (i.e. correct installed and configured). The procedure is not sufficient to do a complete assessment after lightening damage etc. Refer to the separate troubleshooting chapter for more details

Symptom	Checkpoint/Problem/Correction
Black screen	<ol style="list-style-type: none"> 1. Check that the connector is inserted correctly and the monitor switch turned on 2. Check that the power supply is connected and 230V is present. A LED on the PC-Connection box should indicate that 12V is present. 3. Check the contrast adjustment 4. If only one monitor is not working, try another connector
The display starts directly in the shooting screen	<ol style="list-style-type: none"> 1. The display is in PC-control mode. Se the chapter "Use of ML2000" for a manual procedure to bring the display back to manual control.
The display will not enter READY state	<ol style="list-style-type: none"> 1. Check that the RJ45 cable for connecting the target network is plugged into both contacts in the PC-connection box. 2. Check that the target connection cabinet is correctly connected (in particular the white RJ45 cable inside the cabinet) 3. Verify that the battery is charged. A green LED in the target connection cabinet should be on if there is sufficient voltage on the battery. If the battery is discharged an emergency procedure could be to disconnect the battery and try to run the targets with the charger only (disconnect the cable shoe on the battery) 4. Check that the target cables are connected properly 5. Check that one display in the segment is configures as MASTER (usually the display at lane 1). 6. Check that you are connected to the correct segment (group of targets sharing data line and target connection cabinet). 7. Check if the LED's on the surge protection at shooting stand is blinking and that the data LED inside the target connection cabinet is blinking.
Shots arrive several seconds after fired	<ol style="list-style-type: none"> 1. Check that only one display is configured as MASTER within the target segment.
Faults in detection or sporadic missing shots	<ol style="list-style-type: none"> 1. Check the sound pressure values and/or the rubber or paper bands. Maintain the target if necessary.