MPS 501 INTEGRATED MEASUREMENT SYSTEM

USER'S MANUAL   Ver: 1.05 (2007)

Sport Expert

Professional Sport Technologies

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1. GENERAL SAFETY SUMMARY

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect And Disconnect Properly. Connect and disconnect all the necessary plugs and cables while the product is switched off.

Grounding The Product. When operating with AC power, this product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Replace Batteries Properly. Replace batteries only with the proper type and rating specified.

Recharge Batteries Properly. Recharge batteries for the recommended charge cycle only.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

2. DEFINITIONS OF KEYS USED ON THE FRONT PANEL OF UNIT

Keys used for the setting of parameters selected to be changed

Function selection keys relating to the tests (Some Functions are active if they cover the features of purchased system)

Function selection keys relating to the setting,
(The function represented by it at that moment,
is read on the top graphical display screen)
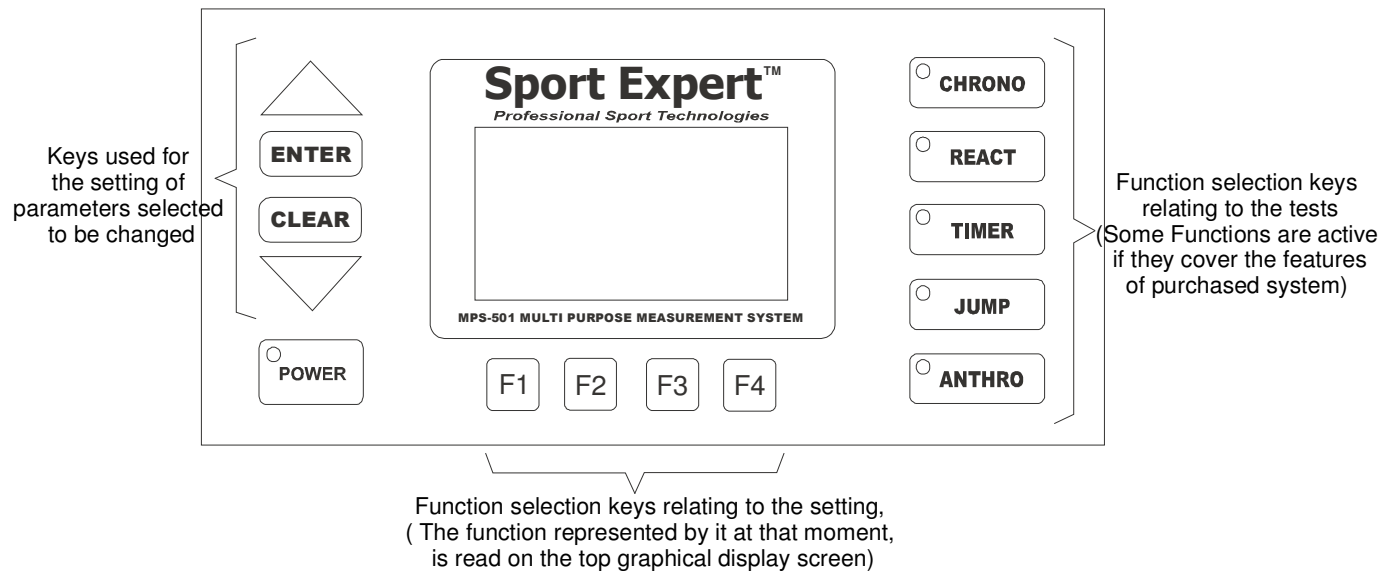
3. DEFINITIONS OF CONNECTORS USED ON THE REAR PANEL

RS 232 Computer interface connection and printer connector

Manual START / STOP button and cabled mode operation and charging connector for gates

Scoreboard data line connector

90 240 VAC mains supply line socket together with fuse holder

Keyboard and barcode reader line connector

Line connector of antrophometry set

Main ON / OFF switch

Line connector for jumping sticks and reaction buttons junction box (JB103)

Line connector for stimulus generator

Line connector for sound unit

START and STOP code settings of telemetric system gates

4. GENERAL VIEW OF THE LCD DISPLAY

General architecture of graphical display screen find below the sections and features of graphical display screen where on the systematic data are observed and settings are performed

Date of day

Active function displaying section

Time of day

Ambient Temperature

01/01/03 25 C
16:30 BAT:12.6V

Internal battery charging level indicator

OOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOO

Display section for test results and setup parameters

F1   F2   F3   F4

Section of variable function keys used by depressing on the keys of F1, F2, F3 and F4

5. CHRONO

5.1. COMPONENTS REQUIRED FOR CHRONOMETER FUNCTION

1. MPS 501 Main System
2. SE TX 01 telemetric system gates (Optional)
3. Manual START / STOP button (Optional)
4. Sound Unit (Optional)
5. Scoreboard (Optional)

5.2. INSTALLATION OF SYSTEM

The components, which are to be used, are installed on the rear panel of MP 501 as shown below. There is no need to make any connection for the telemetric system gates. However, the code settings of telemetric system gates and MPS 501, must be the same.
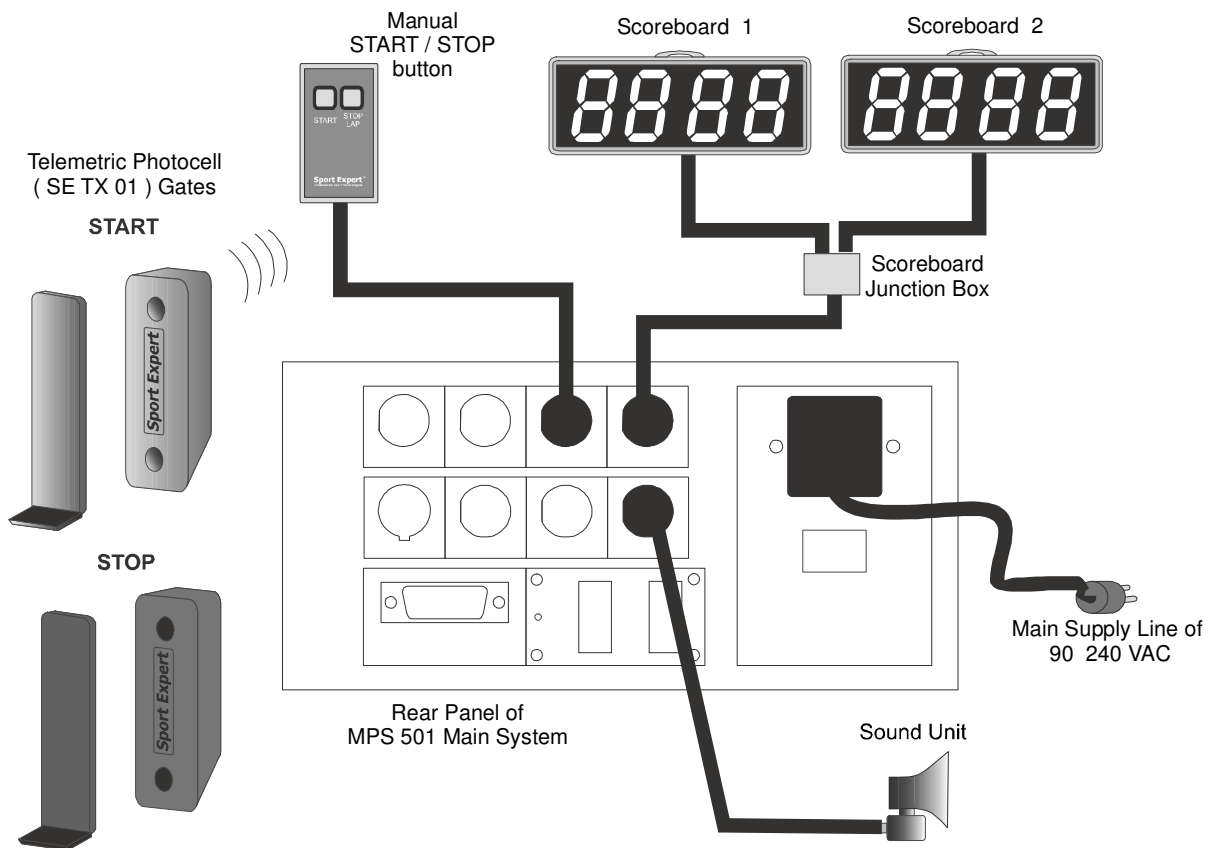
5.3. TELEMETRY PHOTOCELL GATES

As a standard, each system contains three telemetric photocell gates. One of them is the START gate, which activates the system and the other two are the STOP gates, which stops the system or takes an intermediate value. On the backside of these gates, there take place two LED lights seated side by side. Following the powering of gates, these lights start to flash. According to the colors of these lights, it is possible to monitor the charging levels of internal batteries. These colors and their meanings are shown in the label affixed on the panel taking place behind the gates and their function as described below.

Led 1	Led 2	Description
Green	Green	Full charge
Red	Green	Charge is OK
Red	Red	Just above battery low level
Off	Red	Battery low, gates cannot be operated in this condition

Back wiev of photocell gate

- Top photocell led (Orange)
- Switches used for coding and operational settings
- Battery charging level indicator
- External cable operation and charging connectors
- ON / OFF switch
- Bottom photocell led (Orange)
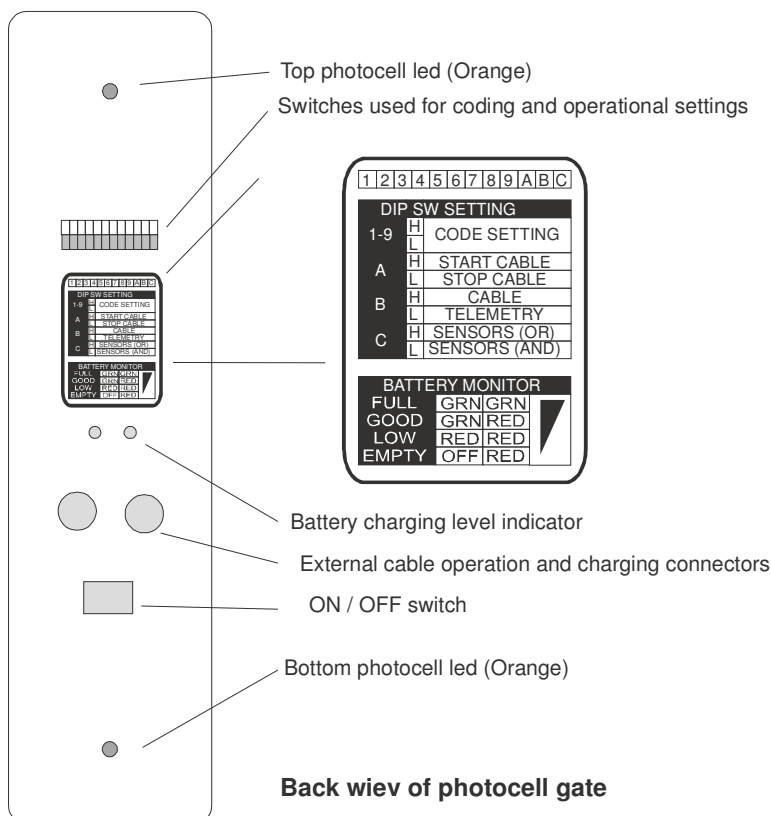
The charging time of batteries varies according to the charge level of battery. The gates are charged through the connector seated behind the main system. In order to enable the charging of gates and main system, the main system must be turned on and connected to the 220 V AC Mains Supply Line. It is not considered important whether or not the gates are left in turned ON or turned OFF position during the charging cycle. In order to understand whether or not the gates are charged, the gate is turned ON if it was in turned OFF position and the colors of two LED lights seated behind, are checked. If two led lights still continue to illuminate in green color after waiting for a long period, this goes to show that the batteries are fully charged. Both LED lights of those gates, which had been used for a long time (nearly one year), no matter how they have been charged at a sufficient level, may not illuminate in two green color after a while. This is not regarded as a problem because it is a normal situation originating from the proper service life of a battery. The service lives of those batteries, which are regularly charged and switched out when the gates are not used, are varying between 3 to 4 years. Against the possibility of being left turned on or in case a long period has not elapsed in the meantime those gates automatically turned off. If no period has elapsed in the meantime when they were in operational condition, the automatic turn off period takes 20 minutes and if they were not in operational condition, then this turn OFF period takes 2 minutes. In this case, by using the ON / OFF switch located behind the gates, the unit is again made operational by turning OFF and ON.

5.3.1. INSTALLATION OF GATES AND REFLECTORS
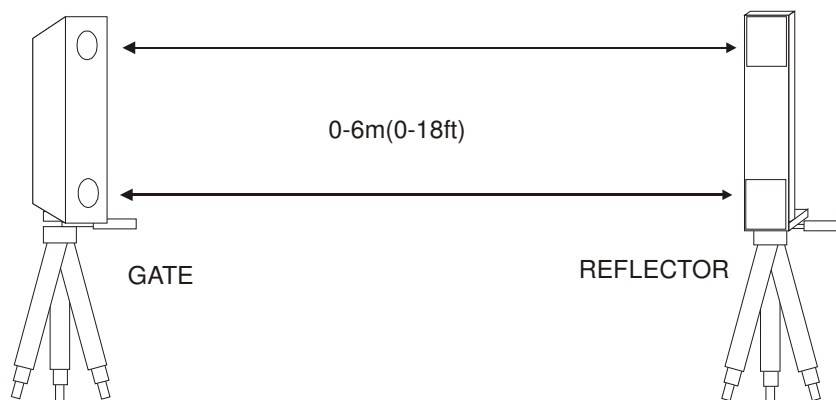
The distance between the gates and reflectors could be adjusted between 0 to 6 mt. (0 to 18 ft). It becomes difficult to set the gates as long as the distance gets longer. The existing charging level of gates also affects the adjusting of maximum distance between the gates. Following the mounting of photocell gates and reflectors onto the tripods, upper and lower reflectors parts must have been installed in a mode that they have to see gate's upper and lower sensors face to face. In order to verify the accurateness of this procedure, those two orange colored lights which coincide with the same line of photocell devices located behind the gates, must be in off position (while the gates are left turned on.) (See figure below).

PHOTOCELL GATE & REFLECTOR
MOUNTED ON TRIPODS
(TOP WIEV)

WRONG !　　　　　　WRONG !　　　　　　TRUE
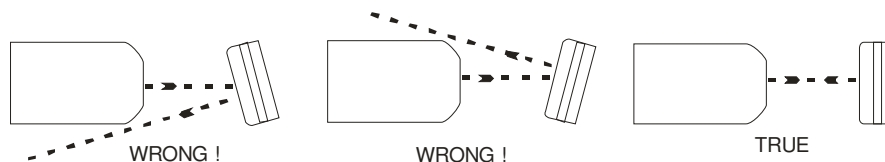
PHOTOCELL GATE & REFLECTOR
MOUNTED ON TRIPODS
(SIDE WIEV)

WRONG !　　　　　　WRONG !　　　　　　TRUE
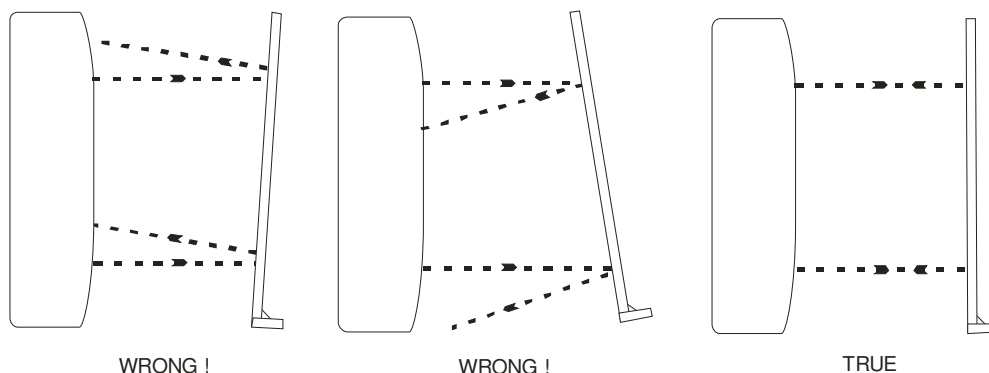
Upon the completion of the code setting of gates, the space (top and bottom) which is existing between reflectors and photocell devices, is blocked by an object in order to check whether the orange colored lights located behind, are illuminated or not. (See figure below)

STEP 1　　　　　　**STEP 2**　　　　　　**Gates are ready to operate**

SIDE WIEV　　　　　　SIDE WIEV　　　　　　SIDE WIEV

ORANGE LED ON　　　　ORANGE LED OFF　　　　ORANGE LED OFF

ORANGE LED OFF　　　　ORANGE LED ON　　　　ORANGE LED OFF

BACK WIEV　　　　　　BACK WIEV　　　　　　BACK WIEV
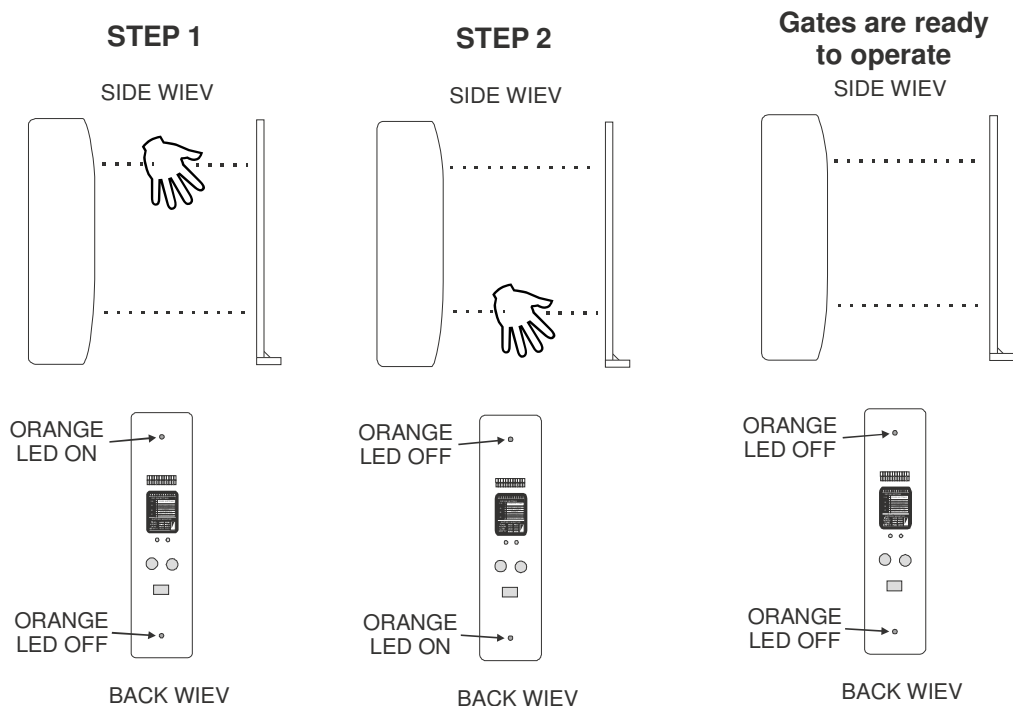
Testing gate alingment

5.3.2. CODE SETTING OF GATES

TELEMETRY GATE
CODE SETTING
DIP SWITCHES

MPS 501 BACK PANEL
CODE SETTING
DIP SWITCHES
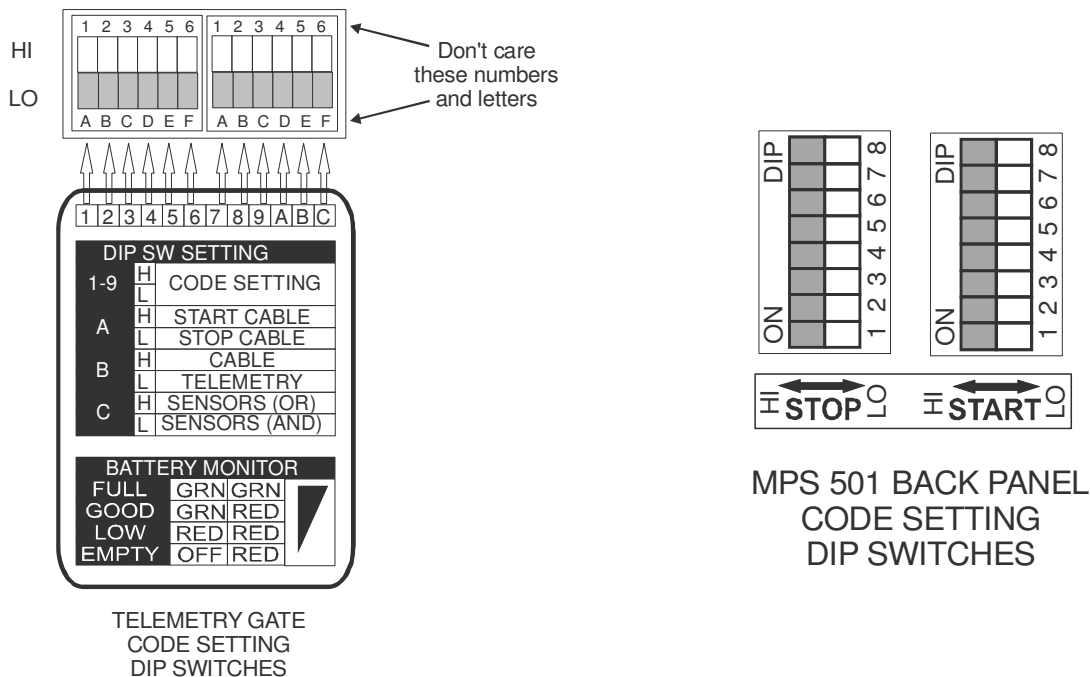
5.3.3. SWITCHES NUMBERED BETWEEN 1 TO 9:

Those switches, which are numbered between 1 to 9 and located on the rear panel of gates, serve to perform the code settings. Two code setting switch groups (each consisting of same type 8 secondary switches to be used for START and STOP settings) which are located both on the rear panel of main system and gates, shall be set in high (H) and low (L) positions. Switch numbered 9 on the gate is reserved and always must be left at H position.

5.3.4. A SWITCH: (Apllicable only with cable operation)

The signal to be generated by this gate during the cabled operation of system is set to START or STOP through this switch. When this switch is in high (H) position, the gate transmits START signal and when this switch is in low (L) position, and then the gate transmits a STOP signal.

5.3.5. B SWITCH:

This switch serves to select the transmission of signal either in the cabled or telemetry operation mode of system. When that switches is in high (H) position, the gate transmits the signal over the cable. When the system is in this position, it does not work without the cable connection. When this switch is in low (L) position, the gate transmits the signal in telemetry mode. When the gate is in this position, according to the setting positions of switches numbering between 1 to 8 (note that sw 9 is reserved), it generates a telemetry mode signal and then transmits it to the main

system. For cable operation user must install supplied telemetry gate data cables to each gate and to main system. Also, depending on the application user must set switch A (Described above) as START or STOP depending upon the test applied. Note that in cable operation switches between 1-9 (code setting for telemetry) are not functioning.

GATE n
(STOP)

DIP SW A
SET TO LO
DIP SW B
SET TO HI

GATE2
(STOP)

DIP SW A
SET TO LO
DIP SW B
SET TO HI

GATE1
(START)

DIP SW A
SET TO HI
DIP SW B
SET TO HI

Rear Panel of
MPS 501 Main System
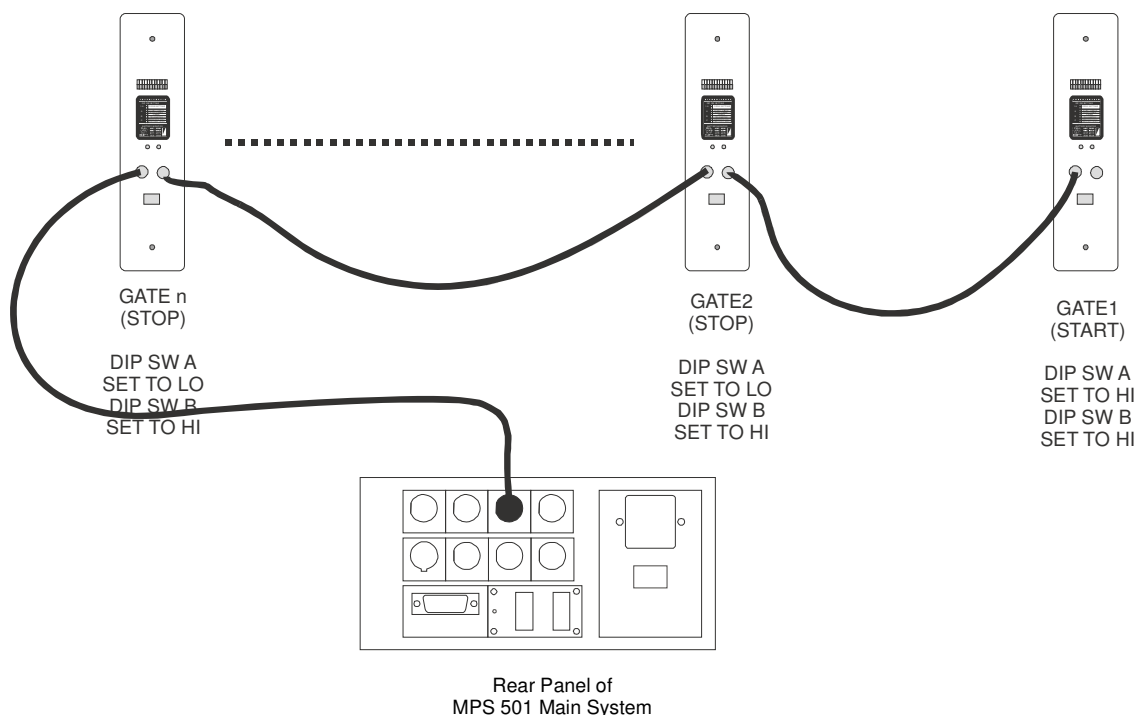
5.3.6. C SWITCH:

This switch serves to select the operation mode of two each photocell devices. When this switch is in high (H) position, the system generates a signal in case of any those two photocell devices, is blocked. When this switch is in low (L) position, it transmits the signal only in the case when two photocell devices are blocked simultaneously. The reason for this action stems from the fact that the system must be prevented from sending the signals earlier as a result of extending the hands and legs forward before the runner reaches the gates. In this position, in order that the system could be able to transmit a signal, the whole body must pass through the gates.

5.4. OPERATION OF CHRONO FUNCTION

It is preferably advised to use always POWER switch behind the back panel of MPS Main system in order to increase battery life of the system).
When the system is firstly started (through the main button located behind), it begins to operate directly in CHRONO function.

5.5. DATA AND FEATURES DISPLAYED ON THE MAIN SCREEN

```
┌──────────────────────────────────┐
│ ┌───────┐ 01/01/03    25°C       │
│ │CHRONO │ 16:30  BAT:12.5V       │
│ └───────┘                        │
│      TIME 1= 0:00:00.000         │
│      TIME 2= 0:00:00.000         │
│      TIME 3= 0:00:00.000         │
│      TIME 4= 0:00:00.000         │
│                                  │
│  ┌────┐┌────┐┌────┐┌────┐        │
│  │CDTM││PAGE││CONF││SAVE│        │
│  │00:00││ 1 ││ SET││READ│        │
│  └────┘└────┘└────┘└────┘        │
└──────────────────────────────────┘
```
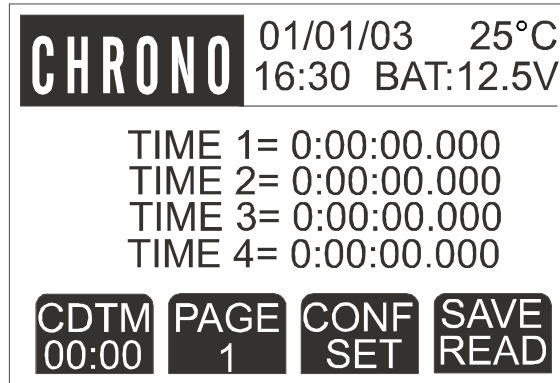
5.5.1. TIME 1 - TIME 16 (PAGE1-PAGE4)

Those times, which can be produced according to the result numbers, which are defined on the chrono setup page (See next part of manual) appear on the screen. If the result number is set over 4, then depressing on the F2 function key, the entry is made into the other pages which cover other values (maximum 16 values) When the number of active results, appear on the screen, it is returned to page 1. Maximum 4 pages and 16 results are available.

5.6. SETUP PAGE AND SETTING OF THE CHRONOMETER FUNCTION:

When the system is in CHRONO mode, the setting page of chronometer appears on the screen upon depressing on F3 (CONF / SET) key.

```
┌──────────────────────────────────┐
│      CD. TIMER= 00:00            │
│      CD. T. MODE= SALN           │
│        TIME TYPE= LAP            │
│      SO.STA / STP.= Y / Y        │
│       RESLT/DELY= 00 / 00.0      │
│       GATE CODE= SINGLE          │
│        ┌────┐┌────┐┌────┐┌────┐  │
│        │    ││NEXT││NEXT││SAVE│  │
│        │    ││PARM││PAGE││READ│  │
│        └────┘└────┘└────┘└────┘  │
└──────────────────────────────────┘
```
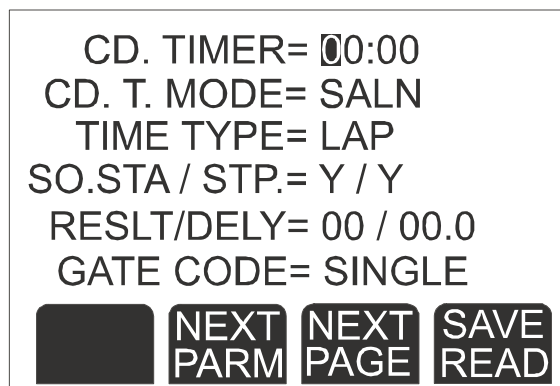
5.6.1. CD. TIMER (Count down timer) SETTING:

In this page CD. TIMER displays the setting time of system's count down feature. At the beginning, this time has been set as 00:00. The first two

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characters represent the minutes while the last two characters have represented the seconds. The first character of timer is displayed on the black background. This implies that this character could be changed. The up arrow key is depressed on in order to change the character and this key is held depressed until the desired value is reached. When the setting of parameter is completed, we once more depress on F2 (NEXT /PARM) key and again using up arrow key second digit is setup to desired value, repeating this procedure for all characters, the setting is completed for all four characters. CD TIMER's instant value while test is performed can be seen on LCD display's lower left part (Above F1 button) on CHRONO page as **CDTM/00:00**. When the setting of CD.TIMER is completed, we once more depress on F2 (NEXT /PARM) key and this time second line of display CD.T.MODE's parameter is changed to inverse color (**SALN**).

5.6.2. CD. T. MODE (Count down timer mode) SETTING:

There are two modes available for Count down timer. First one is **SALN** standalone) mode and second one is **REST** (Rest delay).

In **SALN** mode, count down timer is starting count down from preset value (Described in **CT. TIMER**) simultaneously with START of chrono, when it reaches to 00:00 it activates SOUND UNIT and sound signal is produced (sound signal is produced if sound at stop, SO. STA/STO's 2nd parameter is set as "Y"). When system is reseted, CD TIMER is also reloaded with preset value. CD TIMER's instant value while test is performed can be seen on LCD display's lower left part (Above F1 button) on CHRONO page as **CDTM/00:00**.

In **REST** mode, (it is recommended to set **TIME TYPE** as **SPLIT** in this mode in order get separate results for each sequence) count down timer is activated after a result from gates (Time1…Time16) captured on LCD display. As soon as a result appears on display, count down timer starts to count down from preset value (Described in **CT. TIMER**). When it reaches to 00:00 it activates SOUND UNIT and sound signal is produced (sound signal is produced if sound at stop, SO. STA/STO's 2nd parameter is set as "Y"). At that position system is ready to start for next level of test. When chrono is activated (time starts to count up) and then a result is captured again, count down timer starts to count down from preset value one more time. That sequence is continues until preprogrammed number of results has been reached. That feature is very usefull for tests that has several repeating sequences and needs a rest delay after every sequence for the same person under test. For example, a test is designed as, 20m run 7 times and after each run rest of 15 seconds. Setup of such kind of test is as follows.

<pre>
            CD. TIMER   = 00:15
            CD. T. MODE=REST
          TIME TYPE   = SPLIT
           SO. STA/STO= N / Y
        RESLT / DELY   = 7 / 01.0
          GATE CODE   = DUAL
</pre>

When the setting of CD.T.MODE is completed, we once more depress on F2 (NEXT /PARM) key and this time third line of display **TIME TYPE**'s parameter is changed to inverse color (**SPLIT**).

5.6.3. TIME TYPE SETTING:

There are two modes available for TIME TYPE. First one is **SPLIT** mode and second one is **LAP**.

In SPLIT mode, CHRONO timer is reseted to zero as soon as a result is captured. Captured result is stored as time value next to last captured result on the LCD and remaining result values reseted to zero (0:00:00.000). That feature allows user to get separate results for each part of the test or dedicated results belong to individual intervals.

In LAP mode, CHRONO timer is continues count up after first start and never resets until last result has captured. That feature allows user to get how much time elapsed since the test has been started. Results from LAP mode are referenced to first start time of CHRONO. (See figure below)

The difference between SPLIT and LAP time

	TIME1	TIME2	TIME3	TIME4	TIME5	TIME6	TIME7

SPLIT results of the same sequence

START

| TIME1 |
| TIME2 |
| TIME3 |
| TIME4 |
| TIME5 |
| TIME6 |
| TIME7 |

LAP results of the same sequence

	Time1	Time2	Time3	Time4	Time5	Time6	Time7
SPLIT MODE	0:00:03.000	0:00:05.000	0:00:06.000	0:00:05.000	0:00:07.000	0:00:08.000	0:00:12.000
LAP MODE	0:00:03.000	0:00:08.000	0:00:14.000	0:00:19.000	0:00:26.000	0:00:34.000	0:00:46.000

5.6.4. SOUND START, SOUND STOP (SO. STA / STO) SETTING:

When the setting of TIME TYPE is completed, we once more depress on F2 (NEXT /PARM) key and this time the letter of Y which is facing the SO.STA / STO in the parameter fourth line appears on the black background. This setting is performed in order to see whether the sound unit, during any testing phase, shall function or not function at the start of test. When the depress on the up arrow key, the letter of Y turns into the letter of N and therefore the functioning of sound unit at the start of test, is

cancelled. When we once more depress on F2 (NEXT / PARM) key, then the letter of Y taking place at the right side, appears on the black background. This setting is performed in order to activate the sound unit, during any testing phase, shall function or not function when CD. TIMER count down to zero. When we depress on up arrow key, the letter of Y turns into the letter of N and therefore the function of sound unit cancelled when CD. TIMER count down to zero.

5.6.5. RESLT / DELY SETTING

Number of results and gate activation delay. When we once more depress on F2 (NEXT / PARM) key, then the left zero character of two zero characters, which are facing the **RESLT / DELY** parameter in the fifth line, appears on the black background. These settings, excluding the start function to be used in the chronometer, serve, to indicate the number of gates or the total results to be taken. In order to change the character, the up arrow key is depressed on and held depressed until the desired value is reached. When the desired value is reached the F2 (NEXT / PARM) key is depressed on in order to enter the following character at this instance, the second character starts to appear on the black background In order to change this character, the up arrow key is depressed on and held depressed till the desired value is reached. The maximum number of results to be used in the CHRONO mode or the number of values to be read is between 01 to 16 (Maximum). When the desired value is reached the F2 (NEXT / PARM) key is depressed on in order to enter the following parameter GATE ACTIVATION DELAY, gate activation delay is used for deactivation of gates after a start condition or stop/lap signal. When that parameter is set a certain value, gates are unactive until preset time has elapsed. Gate delay time can be adjusted between 00.3 to 99.9 sec. That feature is usefull for avoiding early triggering of gates when START and STOP gates are located at the same position or avoiding multiple trigering of the same gate during single pass through that gate. Please note that, adjusting DELAY less than 00.3 sec may cause multiple results when telemetry gate has been passed.

5.6.6. GATE CODE SETTING:

When the setting of **RESLT/DELY** is completed, we once more depress on F2 (NEXT /PARM) key and this time sixth line of display, **GATE CODE**'s p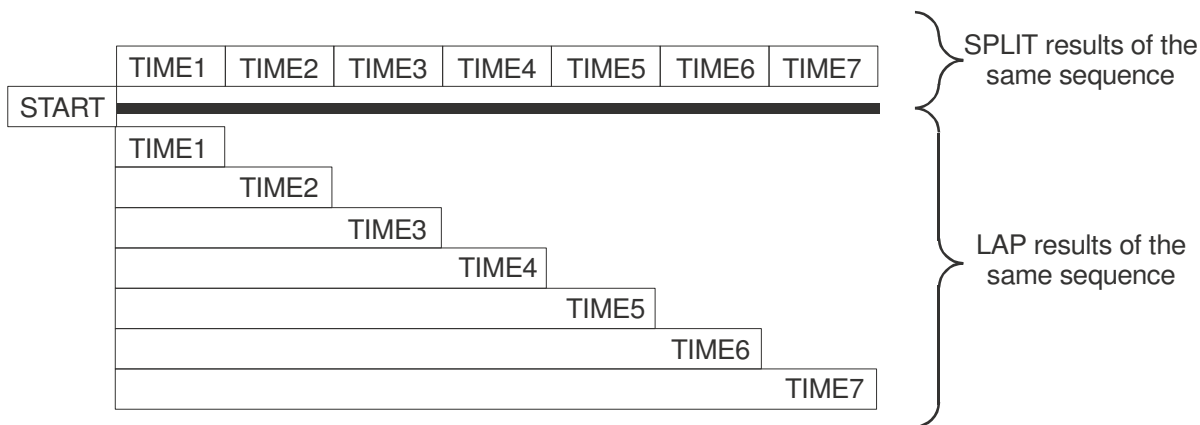arameter is changed to inverse color (**DUAL**). There are two modes available for **GATE CODE**. First one is **DUAL** mode and second one is **SINGLE.** In DUAL mode, in order to operate CHRONO there are needed to use dadicated gates for START and STOP/LAP seperately for functioning properly. In that mode system is started with the activation of START gate and results are captured with STOP gate activations. START gate has no effect on the system once it sends the first signal (START signal) until system is reseted by pressing CLEAR button. In SINGLE mode, one STOP gate is enought to START and STOP/LAP for the system. When that parameter set to SINGLE, one STOP gate is starts the

system when it first activated and then it act as a STOP/LAP gate. That feature is usefull for cyclic tests that start from the same point and results are also captured from the same point. That avoids to use of two gates at the same location for START and STOP/LAP.

When the setup is completed for CHRONO mode, the first setting page of common features and parameters appears on the screen upon depressing on F3 (CONF / SET) key one more time. (See "FEATURES WHICH ARE JOINTLY SET FOR ALL FUNCTIONS SECTION" on page ..)

5.7. TEST SAMPLES FOR SPEED MEASUREMENT:

6. REACT

6.1. COMPONENTS REQUIRED FOR REACT FUNCTION

1. MPS 501 Main System
2. Manual START / STOP button
3. Sound Unit
4. Reaction switches (1 to 3) (Optional)
5. Optical stick sensor sets (1 to 3) (Optional)
6. Video stimulus generator
7. Junction box (JB 103)
8. Scoreboard (Optional)

6.2. INSTALLATION OF SYSTEM

The components, to be used, as shown below, are installed on the rear panel of MPS 501 as shown below. For reaction and agility with optical sticks, installation is as follows,
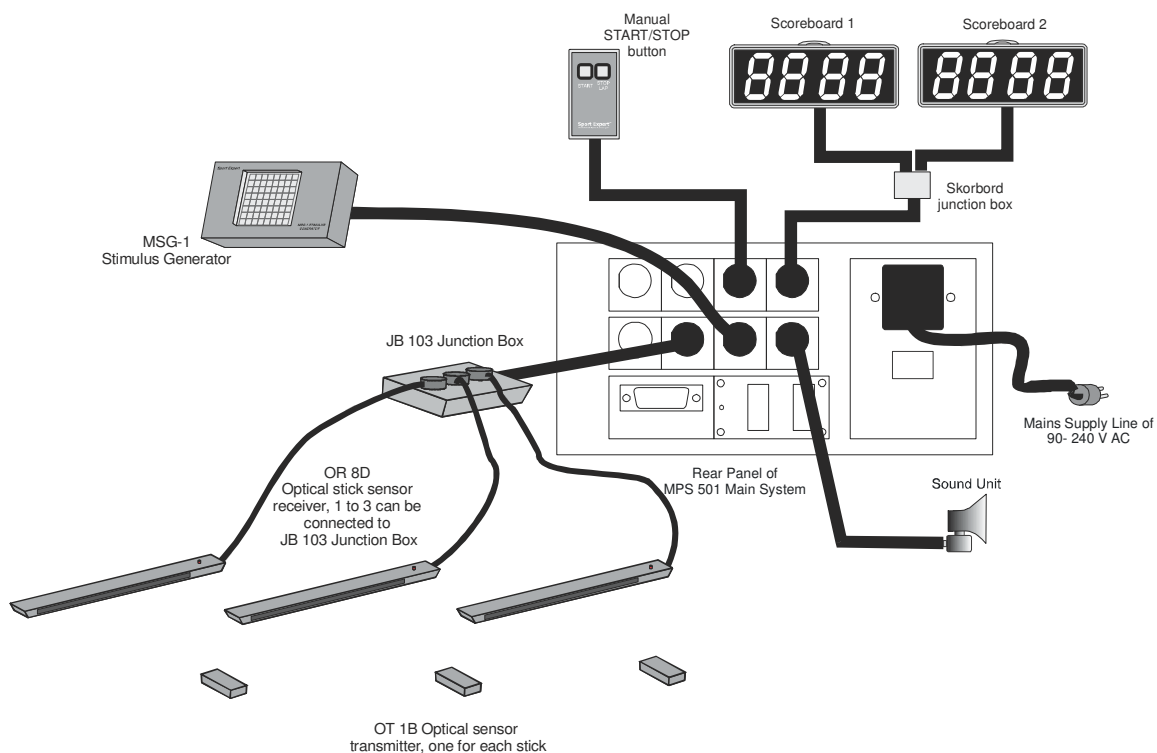
Figure 6.1

For reaction with reaction buttons (Hand-eye coordination), installation is as follows,
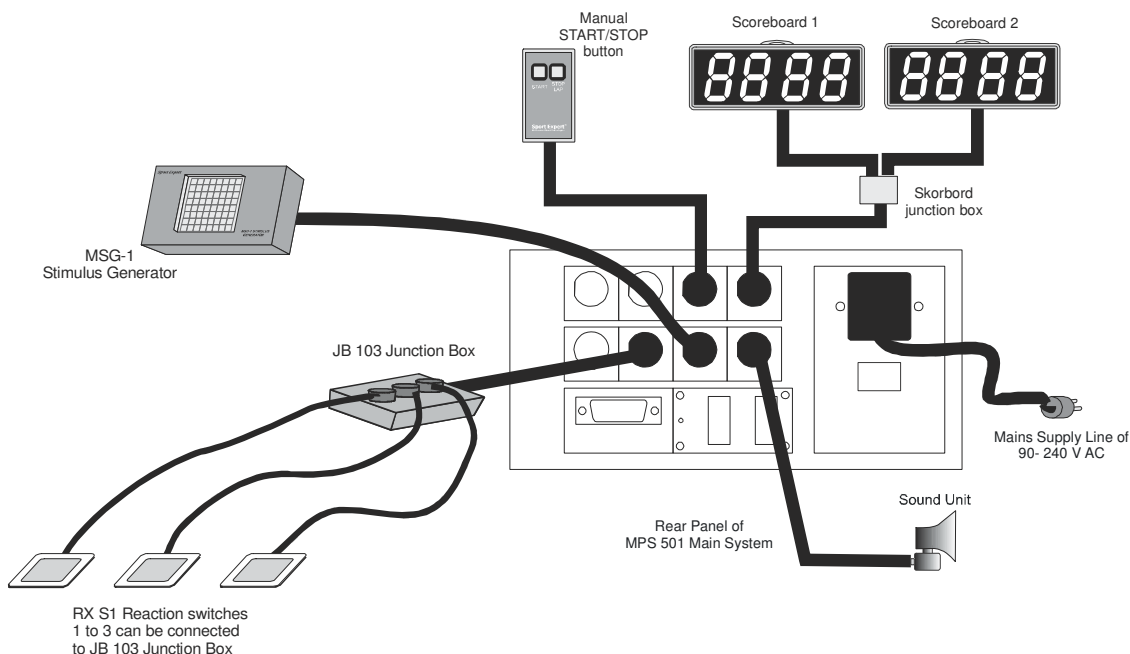
Figure 6.2

6.3. DEFINITION OF REACT FUNCTION

REACT function is basically reaction time and agility measurement system with multi stimulus matrix stimulator. It is possible to display different type of visual stimulus types with three different colors on the stimulator. There are two types of sensor sets available for measurement of reaction time and agility.

1. Zero movement, piezo type ultra fast hand sensors (3 sets),
2. Wide range optical contactless floor sensors (3 sets),

For connecting sensors to MPS-501 main unit a junction box with internal signal conditioning electronics is used.

There are several possibilities for testing reaction times and agilities by preparing different setups with sensors at the desktop or on the floor. Basically there are three modes of opration of REACT function,

1. Predefined time based multiple attempts (MODE 1)
2. Predefined repeat based multiple attempts (MODE 2)
3. Single, reaction and movement time measurement (MODE 3)

6.4. MSG-1 STIMULUS GENERATOR

MSG-1 is a LED matrice type 3 color visual stimulus generator that is used for visually stimulate the person under test.

Figure 6.3

There are 4 different types of stimulus available. Ehach type of stimulus has also 3 different sub choices,

1. Number, 1,2,3
2. Arrow, Left arrow, Forward arrow, Right arrow
3. Shape, Circle, Square, Triangle
4. Color, Red, Green, Orange

Each stimulus is appeared inside an 8X8 matrice multi color LED screen.
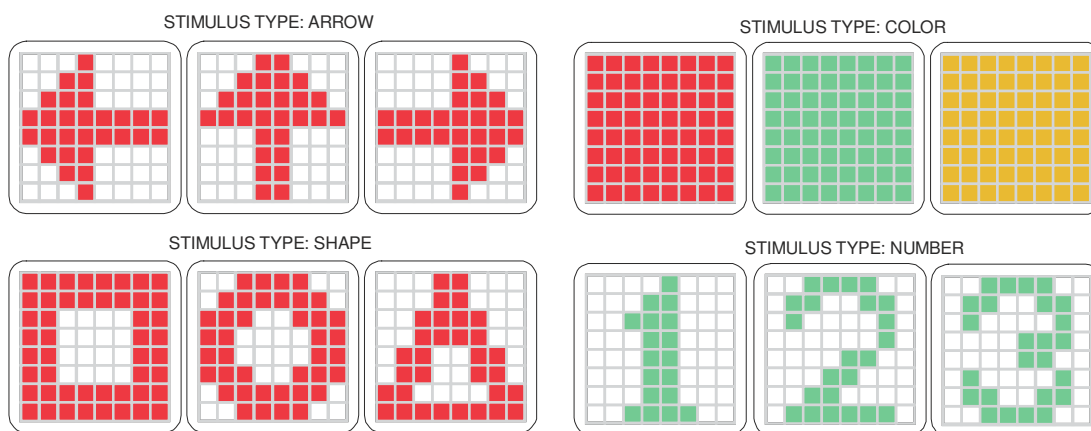
Figure 6.4

MSG-1 and MPS 501 main system is connected to each other with a cable which has screw type connectors on both ends. One end of that cable has 5 pole connecto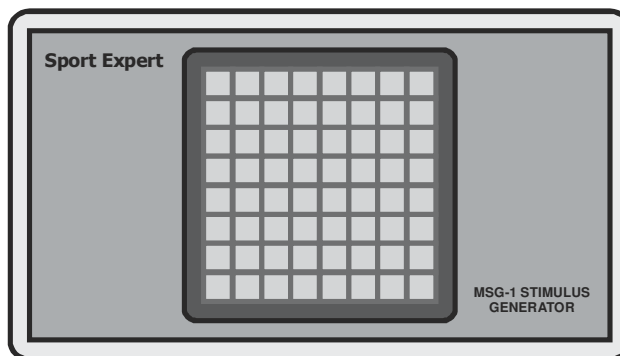r and other end has 8 pole connector. 5 pole connector is plugged to back side of MSG-1 and other 8 pole connector end is connected to back panel of MPS 501 main system, (See figure 6.5).

MSG-1 STIMULUS GENERATOR
CONNECTION CABLE CONNECTORS

MSG-1 SIDE
WILL BE CONNECTED
TO BACK PANEL OF MSG-1

MPS 501 SIDE
WILL BE CONNECTED
TO BACK PANEL OF MPS 501
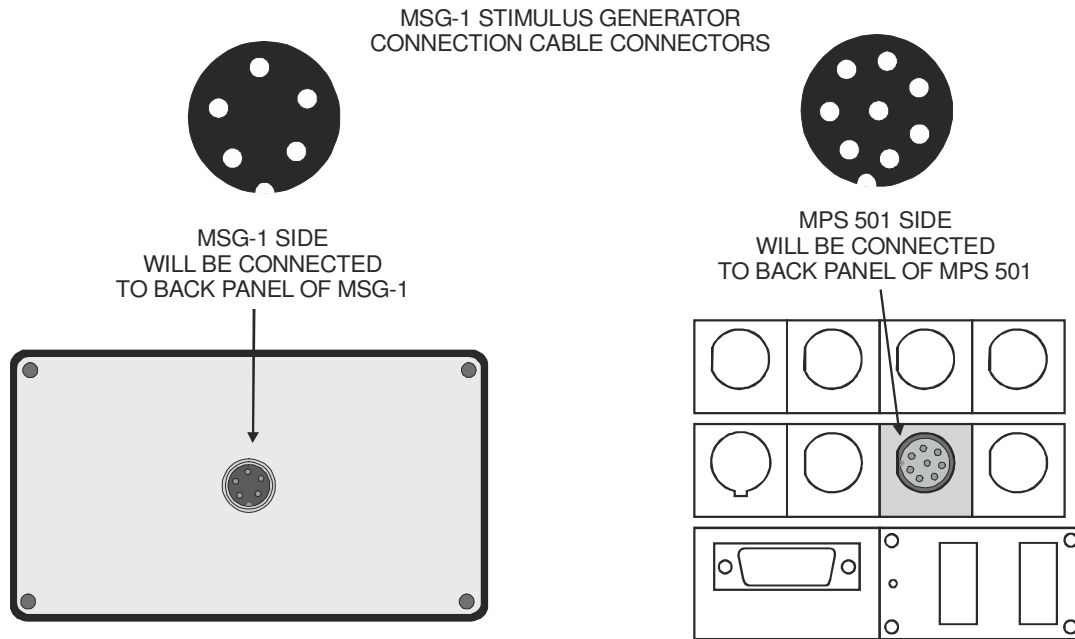
Figure 6.5

6.5. RXS-1 PIEZO TYPE HAND SWITCHES (SENSORS)

There are 3 sets of zero movement, piezo type ultra fast hand sensors included inside the system. Actually these switches are sensors that activated by very little force applied to top surface as soon as they are touched. These sensors do not have moving parts that can cause time delay when first touched to top and is pressed until mechanical contacts touch each other (that needs some time between first touch to top and until mechanical contacts are shorted).
Also these sensors have almost infinite lifetime due to no moving parts against mechanical telegraph like switches.
RXS1 hand sensors and MPS 501 main system is connected to each other with an interface unit named JB 103 junction box. Each of RXS1 hand sensors have cable which one end is directly connected to hand sensor and other end has a 3 pole screw type connector. 3 pole connector is plugged to upper part of JB 103 which has three 3 pole male connectors on top of it. JB 103 has also direct cable out at one side which is used for connecting it to back panel of MPS 501 main system with 6 pole connector, (See figure 6.6).

JB 103
JUNCTION BOX

MPS 501 SIDE
WILL BE CONNECTED
TO BACK PANEL OF MPS 501

RXS 1
REACTION SENSORS
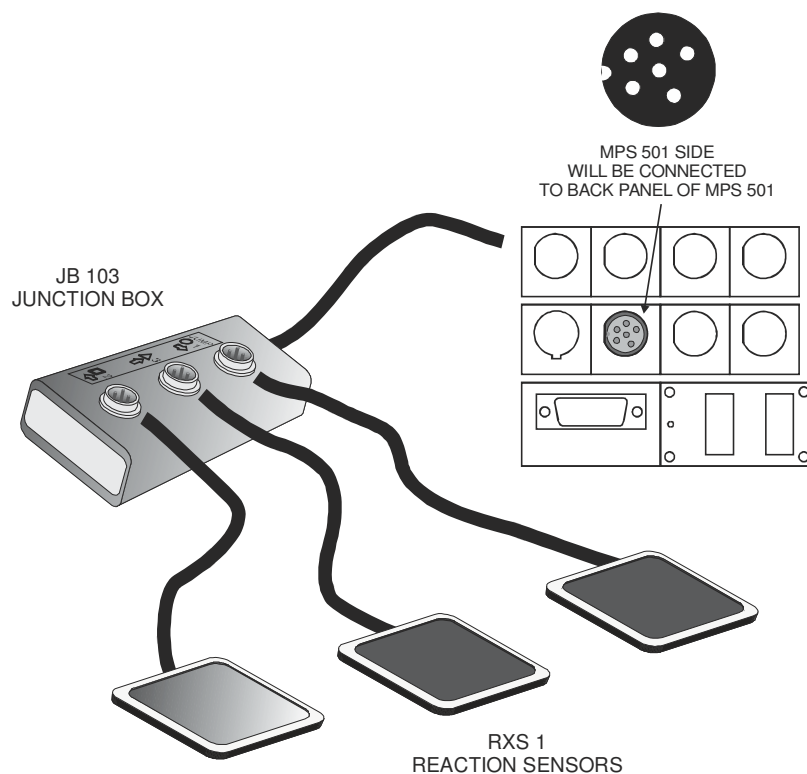
Figure 6.6

Another advantage of these sensors is, they have large contact area (almost 10 times larger then conventional telegraph like switches) that , person under test does not need to focus on the small button top, instead he/she can much more concentrated on to stimulus.

Finally special design of these sensors gives several stimulus types can be assigned to each sensor with special magnet type stimulus templates. There are 12 different type of magnet templates (The same as figure 6.4) supplied that can be easily install on top of the hand sensors. (See figure 6.7)
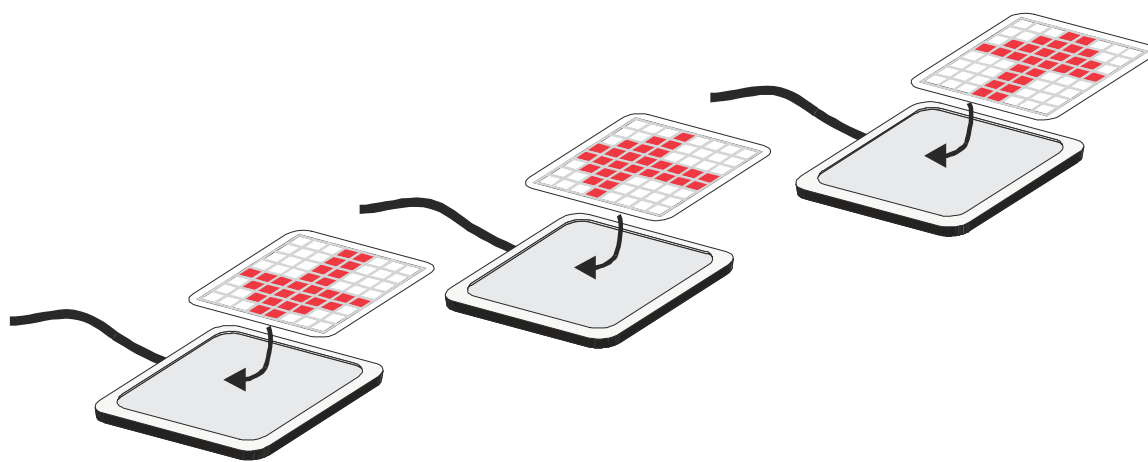
Figure 6.7

Activation of the hand sensor is done by touching or hitting by hand at the center of the sensor. Actually every place on sensor is an active area but as much as the distance increased from center, sensitivity of sensor is decreased and it is necessary to increase the force applied by hand to sensor in order to activate it.

6.6. OR8 D & OT1B OPTICAL CONTACTLESS FLOOR SENSORS

There are 3 sets of wide range optical contactless floor sensors included inside the system.

MPS 501 SIDE
WILL BE CONNECTED
TO BACK PANEL OF MPS 501

JB 103
JUNCTION BOX

OR8D OPTICAL
FLOOR SENSOR

OR8D OPTICAL
FLOOR SENSOR

OR8D OPTICAL
FLOOR SENSOR

OT 1B OPTICAL
TRANSMITTER

OT 1B OPTICAL
TRANSMITTER

OT 1B OPTICAL
TRANSMITTER
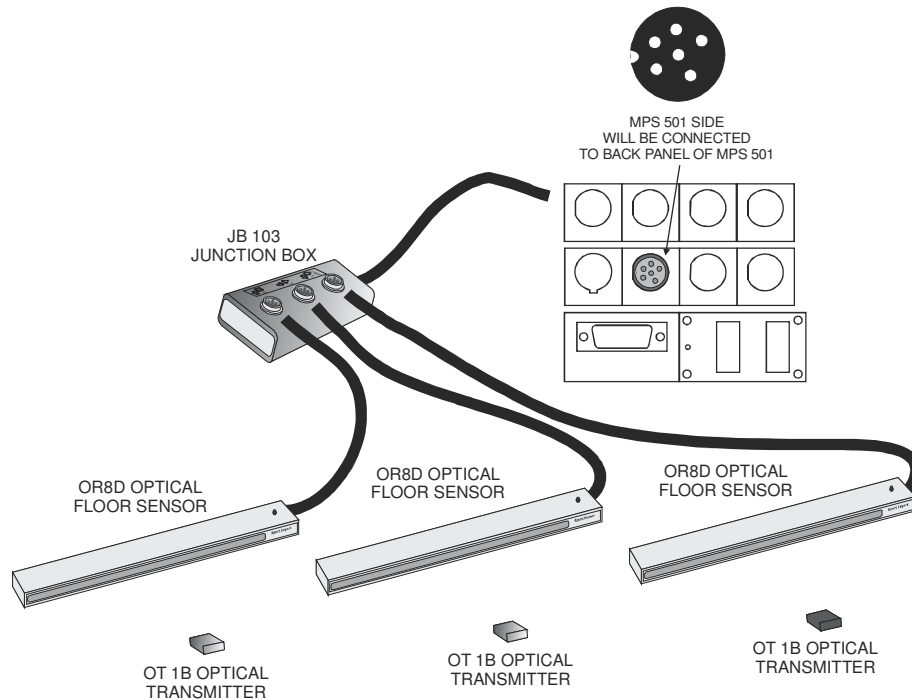
7. TIMER

7.1. COMPONENTS REQUIRED FOR TEMPO GENERATOR FUNCTION

9.   MPS 501 Main System
10. Manual START / STOP button
11. Sound Unit
12. Scoreboard (Optional)

7.2. INSTALLATION OF SYSTEM

The components, to be used, as shown below, are installed on the rear panel of MPS 501 as shown below.

Manual
START/STOP
button

Scoreboard 1

Scoreboard 2

Scoreboard
junction box

Rear Panel of
MPS 501 Main System

Sound Unit

Mains Supply Line of
90- 240 V AC
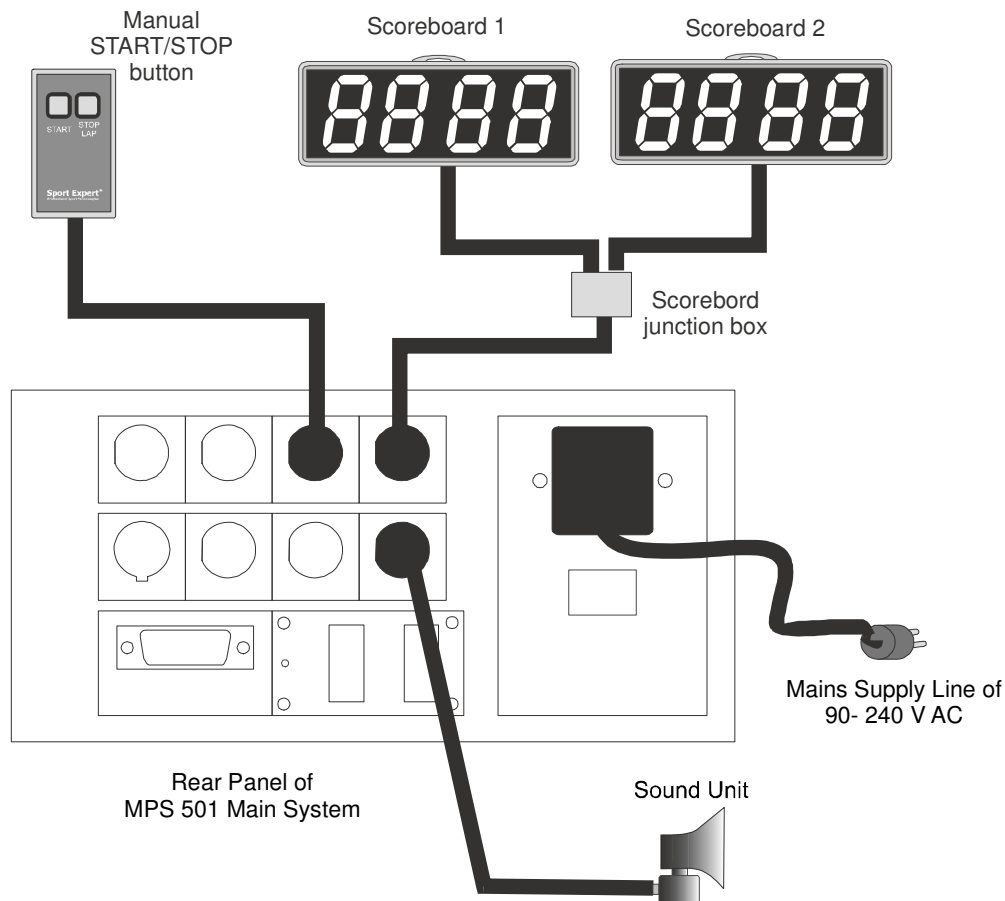
7.3. DEFINITION OF TIMER FUNCTION

Timer function is basically the Programmable Voiced Tempo Generator. As is known, upon the estimatory calculation of athlete's maximal oxygen consumption (Max VO2) in our present day **Shuttle Run** Test protocol widely used by researchers and trainers. Another method used for determination of the anaerobic Threshold (AT, Lactate Threshold) is **Conconi Test**. Both above mentioned tests are depending on the principle of going and coming back in a certain distance by an increasing speed or repeat the running in a certain circular racecourse by an increasing speed. In recent days there are several researcher groups designed and verify their own test protocols based on Shuttle run test with different speed profiles and different durations for levels. With standard casette tapes and CD's it is impossible to apply available protocols to new developed or modified protocols. With MPS 501, user can define any speed and duration profile that requires modified or newly developed protocols with microcontroller based time accuracy and supply visual feedback with scoreboards to person under test.

Timer Function has been eliminating the problems arising from the previous methods (Tape recorder cassette method) applied for the generation of signals, which are required for these tests. During the tests performed for athletes sorted in different physiological groups (children, young men, adults, professional athletes and branch differences), enables the designing of tests according to the physiological conditions of athletes. Moreover, because of its reprogrammable nature, this system can be quite efficiently employed also during the physical training exercises, which require the use of a tempo program to be applicable in the training area at various speeds. The parameters, which can be basically programmable for each level by this function, are as follows,

1. The distance of shuttle run or distance of racecourse ran again (between 1 to 255 mt.)
2. The running speed of athlete (between 0.1 to 255 km/hr)
3. The duration of running with this speed (between 00.01 second and 59:59 minutes)

The above-indicated three parameters identify a level. Within the function, the 39 levels (99 levels for PRG 00) among these consecutive levels can be identified. For each level, the above-indicated parameters can be separately and independently identified. This contrary to the standard Shuttle Run and Conconi Tests, we can develope special tests, which can be performed by applying speeds, which increase and decrease during the conduct of test and also using the time intervals, which are differing for each level.

7.4. OPERATION OF TIMER FUNCTION

It is preferably advised to use always POWER switch behind the back panel of MPS Main system in order to increase battery life of the system).
When the system is firstly started (through the main button located behind), it begins to operate directly in CHRONO function. In order to change mode to TIMER, pres TIMER button located on the right side of front panel. Red indicator LED placed on upper left part of CHRONO button must turned off and red indicator LED placed on upper left part of TIMER button must turned on. Also below indicated display must be seen on LCD display.

7.5. DATA AND FEATURES DISPLAYED ON THE MAIN SCREEN

```
┌──────────────────────────────────┐
│ ▐████▌        01/01/03    25°C   │
│ TIMER        16:30  BAT:12.5V    │
│                                  │
│        PRG./LEV= 00 / 00         │
│        SPD./SHR.= 0.00 / 000     │
│        TDI./TSH.= 00000 / 000    │
│           T.TIME= 0:00:00        │
│                                  │
│   ████  ████  ┌────┐┌────┐       │
│               │CONF││SAVE│       │
│               │ SET││READ│       │
└──────────────────────────────────┘
```
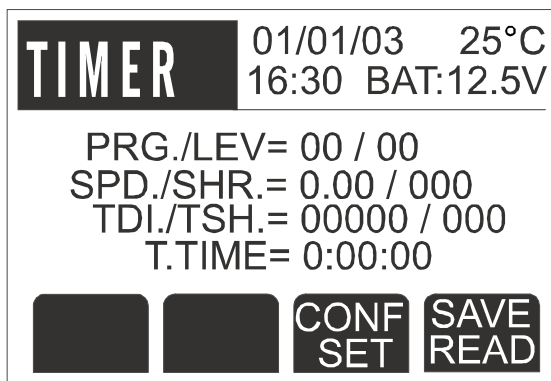
When the system firstly opens (through the back panel main on-off switch), it directly starts to operate in the CHRONO function. In order to select the TIMER mode, it is necessary to depress on TIMER button, which is located at the right side of front panel.

7.5.1. PRG (Program):

It displays the test protocol number stored in the memory. Starting from 00 and raising up to 39. 40 test protocols can be loaded into the memory.

7.5.2. LEV (Level):

It displays the active level number of active test protocol (PRG, between 00 and 49) starting from 00 and raising up to 39 (99 for PRG 00) for each protocol, 40 levels can be identified (100 for PRG 00) for each program.

7.5.3. SPD (Speed):

It displays the speed value (km/hour) programmed for each active level. Between 00.1 and 25.5 km/hr, it can be set by the increments of 0.1 km/hr.

7.5.4. SHR (Shuttle Remains):

It displays the number of shuttles or laps remains for each active level. It is calculated by the system. The identified shuttle time changes depending on the speed and time period of level. At the end of each level, it is calculated depending upon the speed and cone distance values of new level and then reloaded to display, as total number of shuttles will be run for the new level.

7.5.5. TDI (Total Distance):

It displays the total distance (mt) ran till that moment after beginning from protocol. Upon ending of test, the device turns back to the initial state together with all other parameters with depressing on CLEAR key.

7.5.6. TSH (Total Shuttle Run):

It displays the total number of shuttle/lap ran beginning from start of protocol. Upon ending of test, if we depress on CLEAR key located on the device, it turns back to the start after having been reseted together with all other parameters.
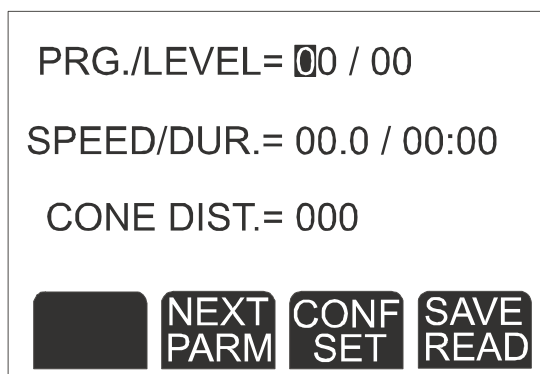
7.5.7. T.TIME (Total Time Elapsed):

 It displays the total time period (hour, minutes, seconds) ran beginning from the start of protocol. Upon the ending of test, if we depress on CLEAR key located on the device, it turns back to the start after having been reseted together with all other parameters.

7.6. SETUP PAGE AND SETTING OF THE TIMER FUNCTION:

This system, by depressing on TIMER key, is brought to the TIMER mode. In case of a necessity, by depressing on F3 (CONF / SET) key, the desired program and level settings are selected. (It must have been programmed in advance) then again by depressing on F3 (CONF / SET) key till we return to the main screen, we can leave the setting screens. When we depress on start key through the Manual Start/ Stop button, three different tones of sound are heard from the sound unit and the required program starts to function. At the end of each shuttle run / turning, a single signal sound with a short duration, is heard. When level changes a longer signal having two tones, is heard. When we wish to end or restart the testing phase, we depress on CLEAR key located on the front panel and then turn back to the initial settings.

When we depress on F3 (CONF / SET) key while the system operates in TIMER mode, the setup page of timer, appears on the screen. Definitions of the parameters are as follows,

```
┌──────────────────────────────────────┐
│  PRG./LEVEL= ▊0 / 00                  │
│                                        │
│  SPEED/DUR.= 00.0 / 00:00              │
│                                        │
│  CONE DIST.= 000                       │
│                                        │
│  ▉▉▉▉  NEXT  CONF  SAVE                │
│        PARM   SET  READ                │
└──────────────────────────────────────┘
```

7.6.1. PRG (Program):

 It serves to set the test protocol number stored in the memory unit. It is used to store a new protocol or recall a protocol which has been previously stored in the memory unit or modifiying a protocol which has been previously stored. Beginning from 00 and raising up to 29, 30 each test protocol can be loaded inside to memory. When this screen appears for the first time, the first character of PRG parameter appears on the black background. The up arrow is depressed on in order to change the character and this key is held depressed untill the desired value is reached. When the desired value is reached, then depress on F2 (NEXT /

PARM) key in order to enter the next character. In this case, the second character of PRG starts to appear on the black background. The up arrow is depressed on in order to change the character and this key is held depressed untill the desired value is reached.

7.6.2. LEV. (Level):

After setting the second character of PRG. parameter, the first character (00) of LEV: parameter appears on the black background when we depress on F2 (NEXT / PARM) key. The up arrow key is depressed on in order to change the character and held depressed untill the desired value is reached. When the desired value is reached, depress on F2 (NEXT / PARM) key in order to enter the next character. It serves to enter or change the level number of active test protocol (PRG, between 00 and 29). It is used to enter a new level or recall a level which has been previously stored or change the parameters (speed, time period and cone/lap distance) of a level which has been previously stored. Starting from 00 and raising up to 39, (as a special case PRG 00 has 100 levels) for each protocol, 40 levels can be loaded on the memory unit for each program (99 for PRG 00). In this case, the second character of LEV starts to appear on the black background. The up arrow key is depressed on in order to change the character and this key is held depressed till the desired value is reached. While LEV. parameter is increased or decreased, the parameters SPD (Speed), DUR (Duration) and CONE DIS. (Cone/ lap distance) which relate to that level, placed on the 2nd and 3rd lines of display can be monitored and can be modified.

7.6.3. SPD. (Speed):

It serves to change the speed (km/h) value programmed for active level. This parameter can be set by the intermediate values of 0.1 km/hr. between ranges of 00.1 to 25.5 km/hr. After setting of the second character of LEV. parameter, if we depress on F2 (NEXT/ PARM) key, the first character of SPD parameter, appears on the black background. The up arrow key is depressed on in order to change the character and held depressed till the desired value is reached. When the desired value is reached, we depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character starts to appear on the black back ground. The arrow key is depressed on in order to change the character and held depressed untill the desired value is reached. When the desired value is reached, we depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the third character of SPD, starts to appear on the black background. The up arrow key is depressed on in order to change the character and held depressed untill the desired value is reached.

7.6.4. DUR. **(Level Duration):**

It serves to change the duration (minutes:seconds) programmed for active level. This parameter can be set by the intermediate values of one second

in the range of 00.00 to 59.59 minutes. After setting the third character of SPD parameter, if the F2 (NEXT / PARM) key is depressed on, the first character (00:00) of DUR. parameter appears on the black background. The up arrow key is depressed in order to change the character and held depressed untill the desired value is reached. When the desired value is reached, the F2 (NEXT / PARM) key is depressed on in order to enter the next character. In this case the second character of DUR parameter starts to appear on the black back ground. The up arrow key is depressed on in order to change the character and held depressed untill the desired value is reached. When the desired value is reached, the F2 (NEXT/PARM) key is depressed on in order to enter the next character. In this case, the third character of DUR. parameter, starts to appear on the black background. The up arrow key is depressed in order to change the character and held depressed untill the desired value is reached. When the desired value is reached, the F2 (NEXT / PARM) key is depressed on in order to enter the next character. In this case, the fourth character of DUR parameter, starts to appear on the black background The up arrow key is depressed on in order to change the character and held depressed untill the desired value is reached.
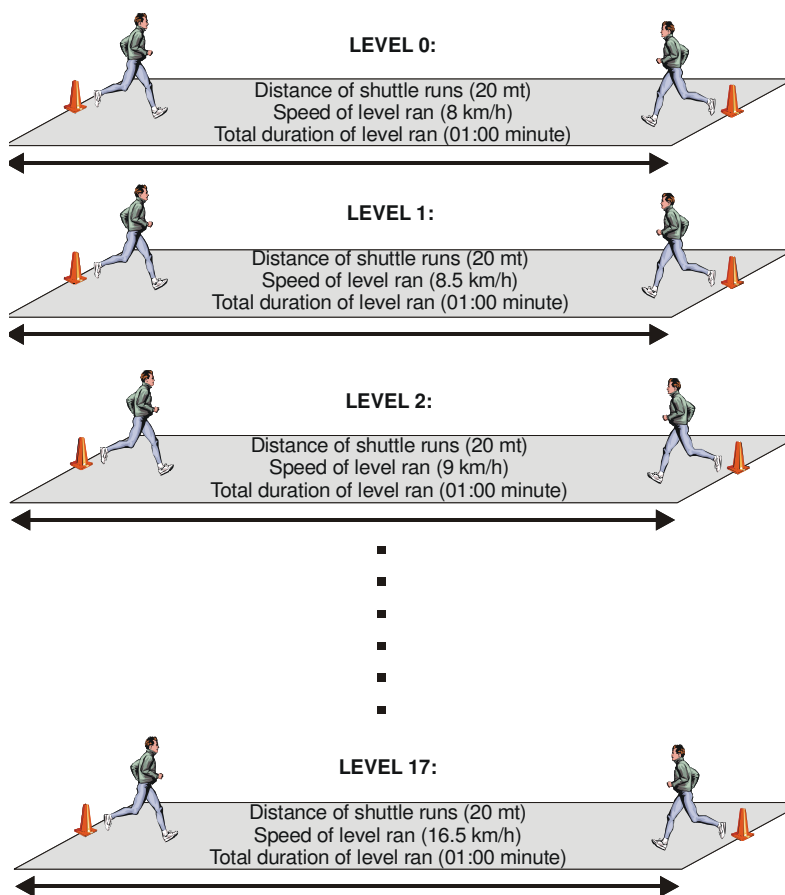
7.6.5. CONE DIST (Cone / Shuttle Distance):

It serves to change the Cone/Shuttle distance value (as meters) programmed for active level. This parameter can be set by the intermediate values of one meter in the range of 000 to 225 mt. After setting the fourth character of DUR parameter, if the F2 (NEXT/ PARM) key is depressed on, the first character (000) of CONI DIST parameter, appears on the black background. The up arrow key is depressed on in order to change the character and held depressed till the desired value is reached. When the desired value is reached, the F2 (NEXT/PARM) key is depressed on in order to enter the next character. In this case, the second character of CONE DIST. starts to appear on the black background. The up arrow key is depressed on in order to change the character and held depressed untill desired value is reached. When the desired value is reached, the F2 (NEXT/PARM) key is depressed on in order to enter the next character. In this case, the third character of CONE DIST. parameter, starts to appear on the black background. The up arrow key is depressed on in order to change the character and held depressed untill the desired value is reached. When the desired value is reached, this goes to show that the setting process has been completed for this level. When we once more depress on F2 (NEXT/PARM) key, the first character of PRG parameter, again starts to appear on the black background. If it is desired to enter a new level, the F2 (NEXT/PARM) key is depressed on till the first character of LEV is reached. Here, one is added to the level number which has been entered just before and parameters of SPD, DUR and CONE DIST. are set for this level. This Process goes on untill all levels of protocol, are identified. When all levels of protocol are identified, by again

depressing on F3 (CONF/SET) key untill return to the main screen, the setting pages are left.

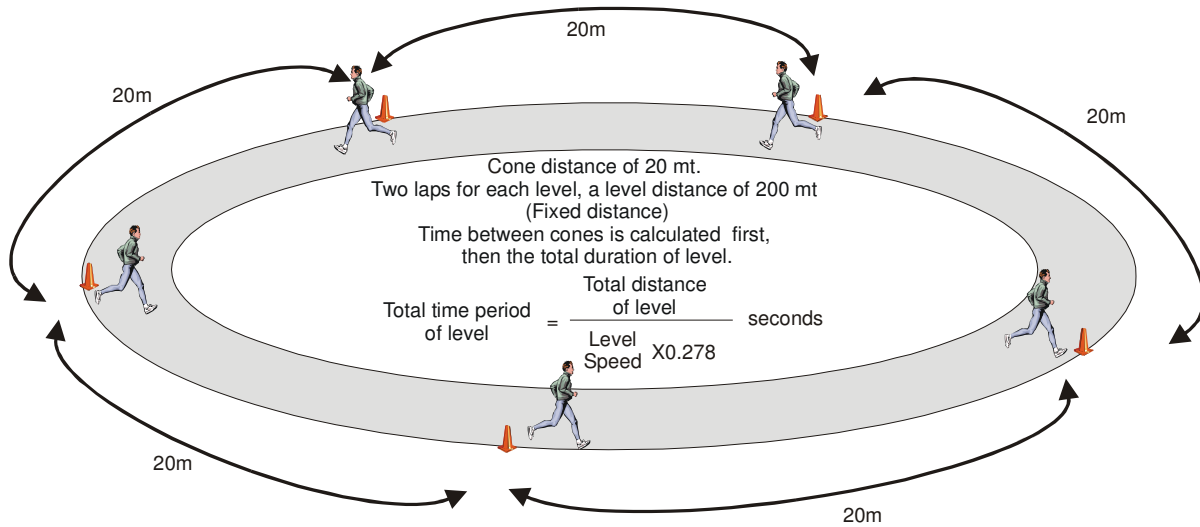## 7.7. TEST SAMPLES FOR ENDURANCE TESTS

7.7.1. TEST SAMPLE FOR STANDART SHUTTLE RUN OF 20 mt

LEVEL 0:

Distance of shuttle runs (20 mt)
Speed of level ran (8 km/h)
Total duration of level ran (01:00 minute)

LEVEL 1:

Distance of shuttle runs (20 mt)
Speed of level ran (8.5 km/h)
Total duration of level ran (01:00 minute)

LEVEL 2:

Distance of shuttle runs (20 mt)
Speed of level ran (9 km/h)
Total duration of level ran (01:00 minute)

LEVEL 17:

Distance of shuttle runs (20 mt)
Speed of level ran (16.5 km/h)
Total duration of level ran (01:00 minute)

The speed and time period data which are defined
for above indicated levels, are regarded as a model
which can be changeable in any way desired.

LEVEL	SPD.	DUR.	CONE DIS.	LEVEL	SPD.	DUR.	CONE DIS.	LEVEL	SPD.	DUR.	CONE DIS.
LVL 0	08.0	01:00	020	LVL 6	11.0	01:00	020	LVL 12	14.0	01:00	020
LVL 1	08.5	01:00	020	LVL 7	11.5	01:00	020	LVL 13	14.5	01:00	020
LVL 2	09.0	01:00	020	LVL 8	12.0	01:00	020	LVL 14	15.0	01:00	020
LVL 3	09.5	01:00	020	LVL 9	12.5	01:00	020	LVL 15	15.5	01:00	020
LVL 4	10.0	01:00	020	LVL 10	13.0	01:00	020	LVL 16	16.0	01:00	020
LVL 5	10.5	01:00	020	LVL 11	13.5	01:00	020	LVL 17	16.5	01:00	020

7.7.2. TEST SAMPLE FOR STANDART CONCONI TEST OF 200 mt

20m

20m

20m

20m

20m

20m

Cone distance of 20 mt.
Two laps for each level, a level distance of 200 mt
(Fixed distance)
Time between cones is calculated first,
then the total duration of level.

$$\text{Total time period of level} = \frac{\text{Total distance of level}}{\text{Level Speed} \times 0.278} \text{ seconds}$$

The speed and time period data which are defined for the
above indicated levels, are a model and changeable in any way desired.

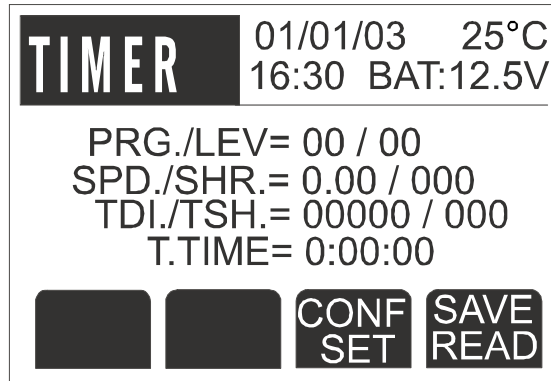| LEVEL	SPD.	DUR.	CONE DIS.	LEVEL	SPD.	DUR.	CONE DIS.	LEVEL	SPD.	DUR.	CONE DIS.
LVL 0	08.0	01:30	020	LVL 6	11.0	01:05	020	LVL 12	14.0	00:51	020
LVL 1	08.5	01:25	020	LVL 7	11.5	01:02	020	LVL 13	14.5	00:50	020
LVL 2	09.0	01:20	020	LVL 8	12.0	01:00	020	LVL 14	15.0	00:48	020
LVL 3	09.5	01:16	020	LVL 9	12.5	00:57	020	LVL 15	15.5	00:46	020
LVL 4	10.0	01:12	020	LVL 10	13.0	00:55	020	LVL 16	16.0	00:45	020
LVL 5	10.5	01:08	020	LVL 11	13.5	00:53	020	LVL 17	16.5	00:44	020

7.7.3. TEST SAMPLE FOR MODIFIED SHUTTLE RUN OF 20 mt

Sample Program
PRG 01
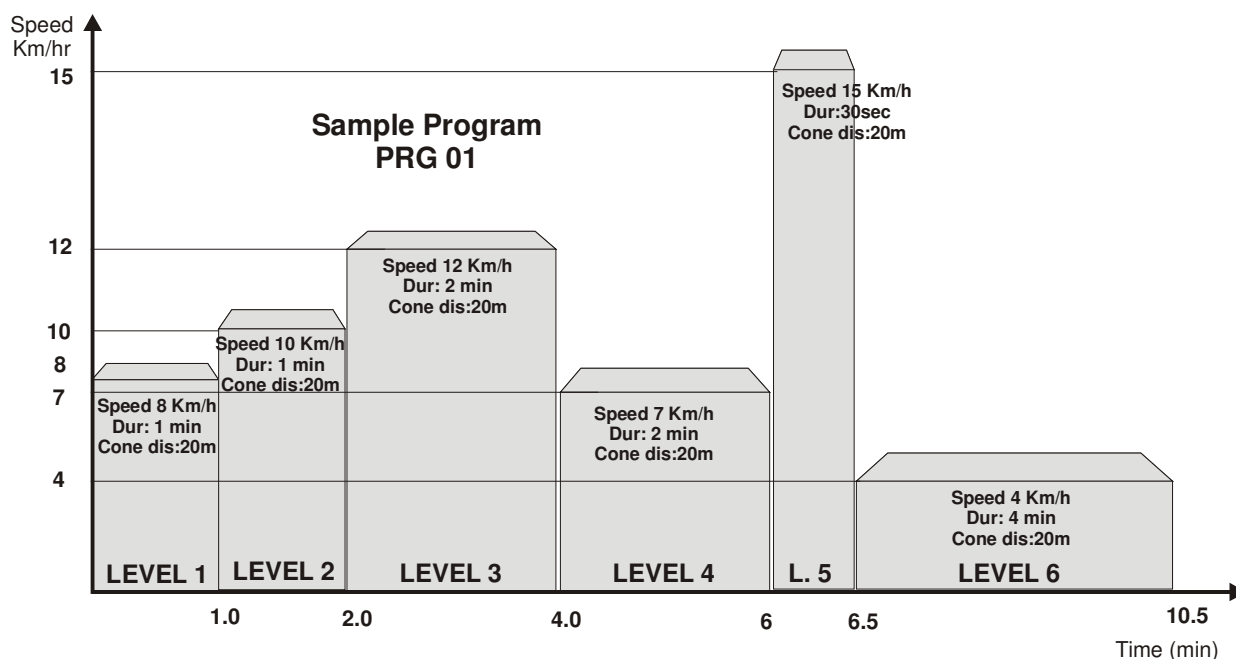
LEVEL	SPEED	DURATION	CONE DISTANCE
LEVEL 0	08.0	01:00	020
LEVEL 1	10.0	01:00	020
LEVEL 2	12.0	02:00	020
LEVEL 3	07.0	02:00	020
LEVEL 4	15.0	00:30	020
LEVEL 5	04.0	04:00	020

7.7.4. PROGRAMMING SAMPLE FOR ONE LEVEL:

```
          01/01/03    25°C
TIMER     16:30  BAT:12.5V

    PRG./LEV= 00 / 00
    SPD./SHR.= 0.00 / 000
    TDI./TSH.= 00000 / 000
       T.TIME= 0:00:00

                  CONF SAVE
                  SET  READ
```

F1   F2   **F3**   F4
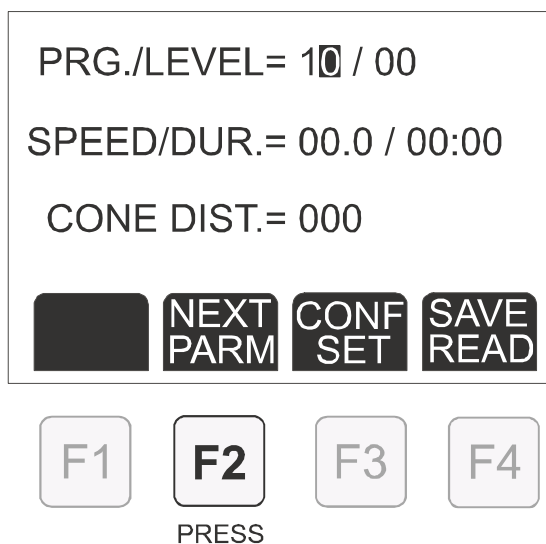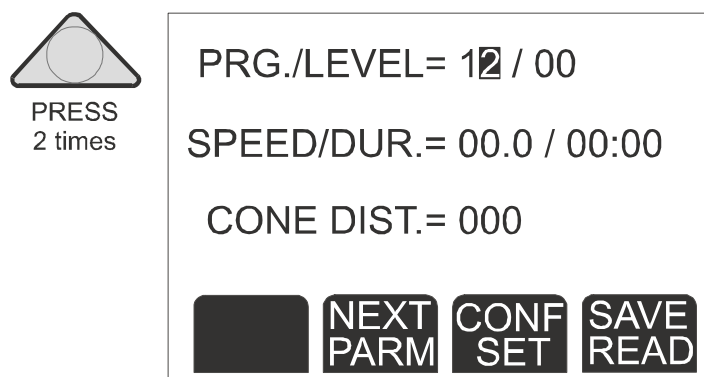
PRESS

After entering the TIMER mode, depress on F3 (CONF/SET) key. When it is depressed on, the setting page appears on the screen.

PRESS
1 times

```
PRG./LEVEL= ▉0 / 00

SPEED/DUR.= 00.0 / 00:00

CONE DIST.= 000

          NEXT CONF SAVE
          PARM SET  READ
```
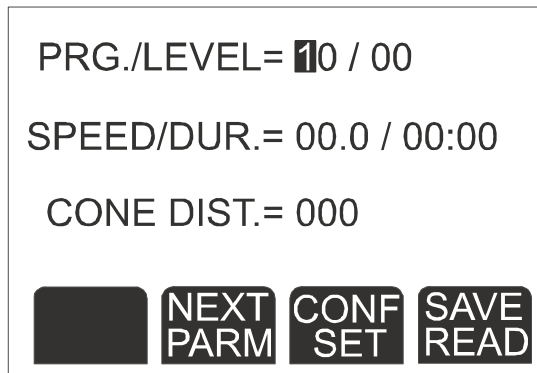
Depress once on up arrow key in order to write the first character of program no: 12 The number of character appearing on the black background, increases one at each depressing on up arrow key. When the first character of program is 1, then depress on F2 (NEXT/PARM) key.

PRG./LEVEL= 1**0** / 00

SPEED/DUR.= 00.0 / 00:00

CONE DIST.= 000

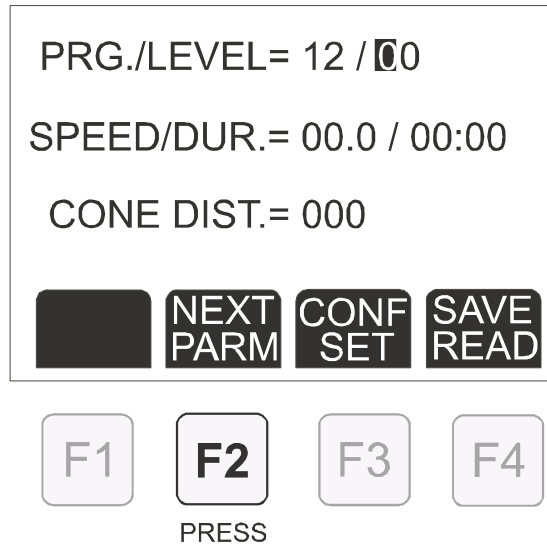| | NEXT PARM | CONF SET | SAVE READ |

| F1 | **F2** | F3 | F4 |

PRESS

When we depress on F2 key after setting the first character, the character at one side, starts to appear on the black background and becomes ready for setting.

PRESS
2 times

PRG./LEVEL= 1**2** / 00

SPEED/DUR.= 00.0 / 00:00

CONE DIST.= 000
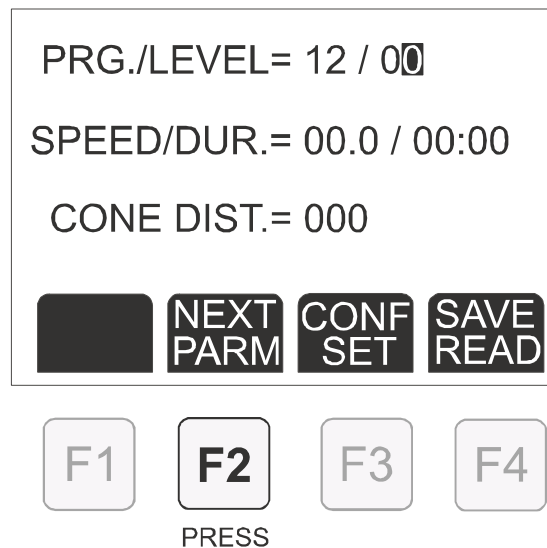
| | NEXT PARM | CONF SET | SAVE READ |

Depress on up arrow key two times in order to write the second character (2) of program no:12. The number of character appearing on the black background increases one at each depressing on up arrow key.
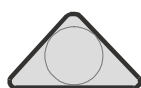
When the second character of program is 2, then depress on F2 (NEXT/PARM) key, the first character of LEVEL placed at right side, starts to appear on the black background and becomes ready for setting.

```
PRG./LEVEL= 12 / ▊0

SPEED/DUR.= 00.0 / 00:00

 CONE DIST.= 000

  ▊        NEXT  CONF  SAVE
           PARM   SET  READ
```

```
  F1     F2     F3     F4
       PRESS
```

Due to the first digit of LEVEL is zero (target level will be set is 04) depress on F2 (NEXT/PARM) key, the second digit of LEVEL placed at right side, starts to appear on the black background and becomes ready for setting.

```
PRG./LEVEL= 12 / 0▊

SPEED/DUR.= 00.0 / 00:00

 CONE DIST.= 000

  ▊        NEXT  CONF  SAVE
           PARM   SET  READ
```

```
  F1     F2     F3     F4
       PRESS
```

Depress on up arrow key four times in order to write the second character (4) of level no:04. The number of character appearing on the black background increases one at each depressing on up arrow key.

PRESS
4 times

PRG./LEVEL= 12 / 04

SPEED/DUR.= 00.0 / 00:00

CONE DIST.= 000

NEXT PARM   CONF SET   SAVE READ

When the second character of level is 4, then depress on F2 (NEXT/PARM) key the first digit of bottom line's (SPEED/DUR) right side, starts to appear on the black background and becomes ready for setting.

PRG./LEVEL= 12 / 04

SPEED/DUR.= 00.0 / 00:00
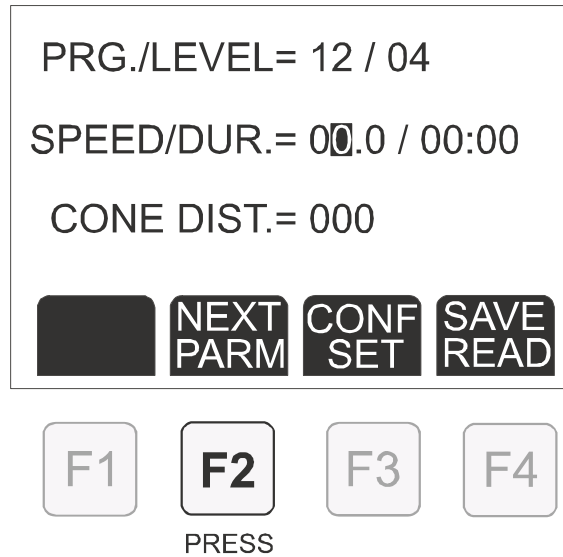
CONE DIST.= 000

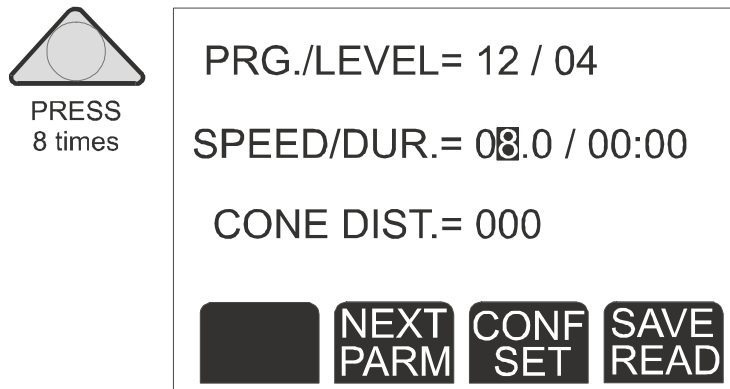NEXT PARM   CONF SET   SAVE READ
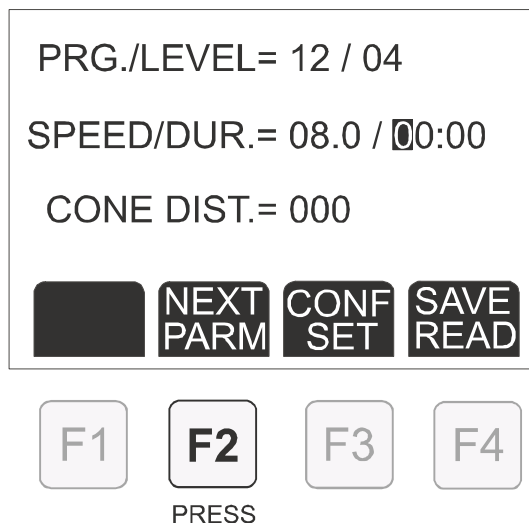
F1   **F2**   F3   F4

PRESS

Due to the first digit of SPEED is zero (target level will be set is 08.0) depress on F2 (NEXT/PARM) key, the second digit of SPEED placed at right side, starts to appear on the black background and becomes ready for setting.

PRG./LEVEL= 12 / 04

SPEED/DUR.= 00.0 / 00:00

CONE DIST.= 000

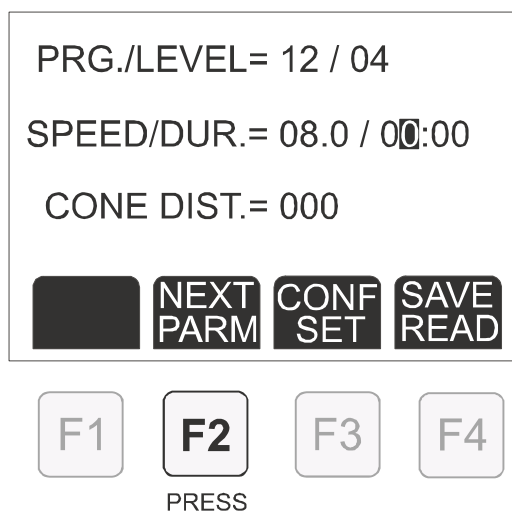| | NEXT PARM | CONF SET | SAVE READ |

F1   **F2**   F3   F4

PRESS

Depress on up arrow key eight times in order to write the second character (8) of SPEED :08.0. The number of character appearing on the black background increases one at each depressing on up arrow key.

PRESS
8 times

PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / 00:00

CONE DIST.= 000

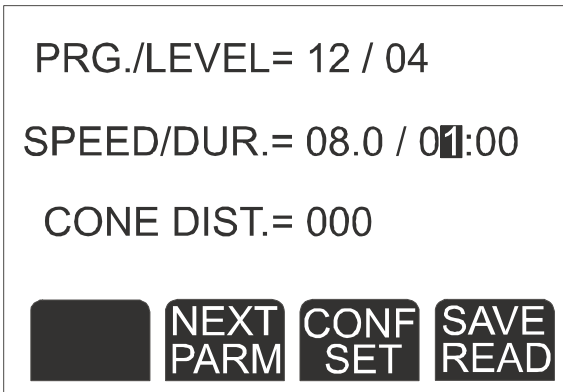| | NEXT PARM | CONF SET | SAVE READ |

Due to the last digit of SPEED is zero (target level will be set is 08.0) depress on F2 (NEXT/PARM) key two times, the first digit of DUR. placed at right side, starts to appear on the black background and becomes ready for setting.

```
PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / ▉0:00

CONE DIST.= 000

        NEXT  CONF  SAVE
        PARM  SET   READ
```
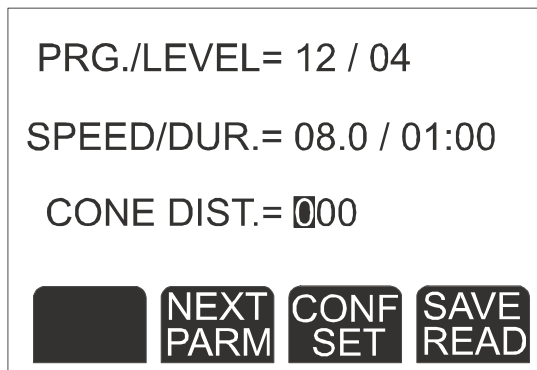
F1   **F2**   F3   F4

PRESS

Due to the first digit of DUR is zero (target level will be set is 01:00) depress on F2 (NEXT/PARM) key, the second digit of DUR placed at right side, starts to appear on the black background and becomes ready for setting.

```
PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / 0▉:00

CONE DIST.= 000

        NEXT  CONF  SAVE
        PARM  SET   READ
```
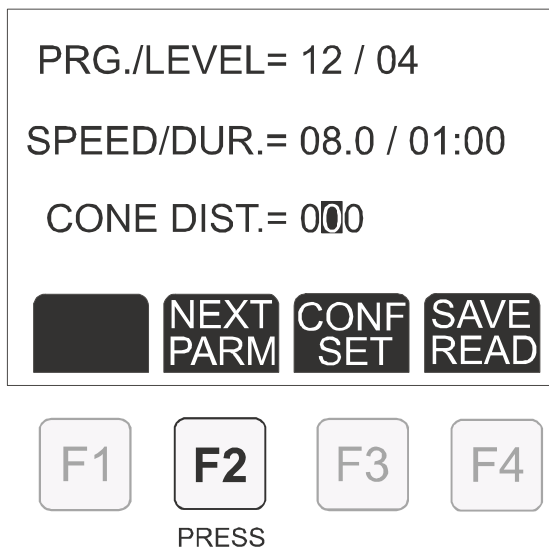
F1   **F2**   F3   F4

PRESS

Depress on up arrow key once in order to write the second digit (1) of DUR :01:00. The number of character appearing on the black background increases one at each depressing on up arrow key.

PRESS
once

PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / 01:00

CONE DIST.= 000
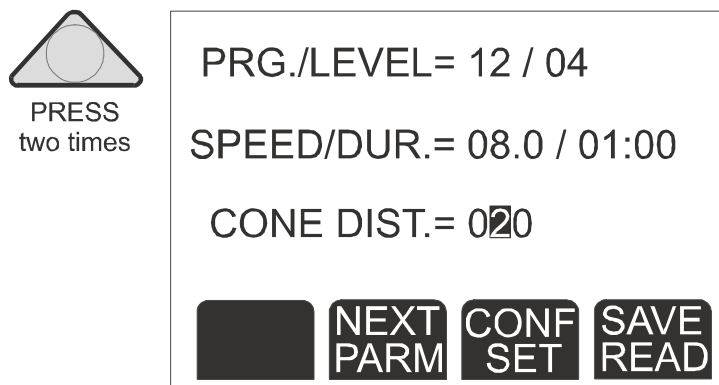
NEXT PARM | CONF SET | SAVE READ

Due to the last two digit of DUR is zero (target level will be set is 01:00) depress on F2 (NEXT/PARM) key two times, at the bottom line the first digit of CONE DIST. placed at right side, starts to appear on the black background and becomes ready for setting.

PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / 01:00

CONE DIST.= 000

NEXT PARM | CONF SET | SAVE READ

F1   **F2**   F3   F4

PRESS

Due to the first digit of CONE DIST. is zero (target level will be set is 020) depress on F2 (NEXT/PARM) key, the second digit of CONE DIST. placed at right side, starts to appear on the black background and becomes ready for setting.

PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / 01:00

CONE DIST.= 0█0

NEXT PARM   CONF SET   SAVE READ

F1   **F2**   F3   F4

PRESS

Depress on up arrow key two times in order to write the second digit (2) of CONE DIST.= 020. The number of character appearing on the black background increases one at each depressing on up arrow key.

PRESS
two times

PRG./LEVEL= 12 / 04

SPEED/DUR.= 08.0 / 01:00

CONE DIST.= 0█0

NEXT PARM   CONF SET   SAVE READ

Due to the last digit of CONE DIST. is zero (target level will be set is 020), level 04 parameter setting for program 12 have been completed. Depress on F2 (NEXT/PARM) key until the first digit of PRG. placed at the top of LCD display, starts to appear on the black background and becomes ready for setting of new program or level parameters. In order to continue programming of next level or another program, repeat steps described this section from beginning until all the programs and levels are programmed.

8. FEATURES WHICH ARE JOINTLY SET FOR ALL FUNCTIONS

The setting page that firstly appears on the screen when the setting page is entered (when the F3, CON / SET keys are depressed on for the first time) covers the settings related to the default function, such as CD. TIMER, CD. T. MODE, TIME TYPE, SO. STA/STO, RESLT / DELY and GATE CODE for CHRONO mode. When F3 (CONF/SET) button depressed on one after the other for the CHRONO mode or all other modes (REACT, TIMER, JUMP and ANTHRO) the pages of screen settings, which relate to the common features of all functions are appear on the screen (totally 4 pages.) The first one of these pages is the setting page covering the date, time and measurement system.

DATE d/m/y= 01/01/00

TIME= 00:00

UNIT= METRIC

| | NEXT PARM | NEXT PAGE | SAVE READ |
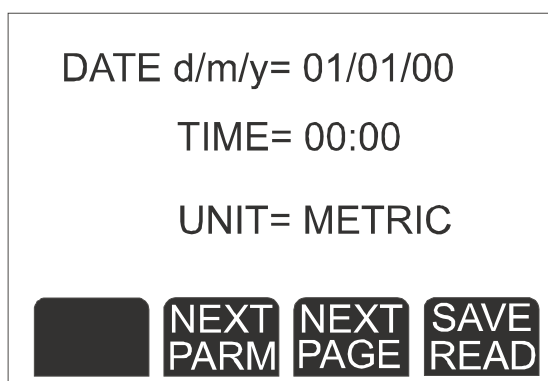
8.1. DATE, TIME AND UNITS ADJUSMENT

Again by using the up arrow and F2 (NEXT / PARM) keys as described above, the parameters, such as daily date, time and measurement system (Metric or Inch) are

set. Independent of mode of UNITS (Metric or inch) date <u>adjustment</u> format is day/month/year. When unit is set to METRIC, on the main display, date displayed as day/month/year, when unit is set to INCH, on the main display date displayed as month/day/year. In METRIC mode, time is 24H format, in INCH mode time is 12H format with AM/PM indicator. It is important that, every time UNIT mode is changed, time must be adjusted again acording to proper time format. In INCH mode, it is also needed to setup AM/PM. When UNIT parameter is changed to INCH mode, at the end of time parameters (hh/mm) it appears A or P letter that indicating AM and PM respectively. After hours and minutes adjusted AM or PM parameter also should be set. Table below expalins how change of UNIT mode effects the system units;

MEASUREMENT	METRIC	INCH
DATE	DD/MM/YY	MM/DD/YY
TIME	24H (00:00 TO 23:59)	12H (01 TO 12 AM/PM)
LENGTH	CENTIMETERS	INCHES
TEMPERATURE	CENTIGRADE	FAHRENEIGHT
SPEED	KM/HR	MILES/HR
WEIGHT	KG	LB

When we again depress on F3, (CONF/SET) key while this screen is displayed, then appears the sound definition setting screen whereon all definition procedures relating to the sounds which shall be emitted by the sound unit at this time, are carried out.

AUDIO 1= 0 / 0.0

AUDIO 2= 0 / 0.0

AUDIO 3= 0 / 0.0

[NEXT PARM] [NEXT PAGE] [SAVE READ]
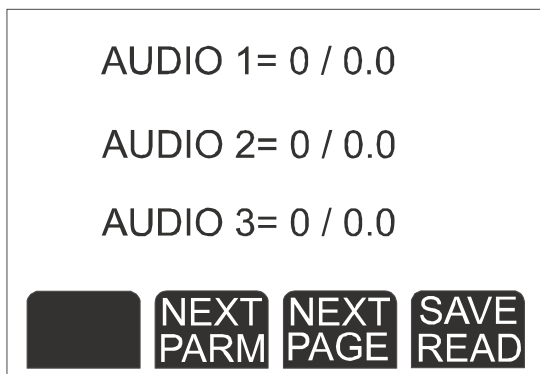
8.2. AUDIO TONE AND DURATION ADJUSMENT

The first parameter defined or this screen is the sound tone. Five sounds tones are defined by the system. These sound tones vary from high to low. (1 represents the lowest frequency and 5 represents the highest frequency). As described above, again by using the up arrow key, the sound tone is selected for AUDIO 1. When we again depress on F2, (NEXT/PARM.) key, the first character of right side parameter, appears on the black background. This parameter serves to indicate for how many seconds this sound tone selected for AUDIO 1, shall continue. This time range can be raised up to 3.0 seconds by the time intervals of 0.1 seconds. Again by using the F2 (NEXT/ PARM) and up arrow keys, we can set the sound and time parameters for AUDIO 2 and AUDIO 3. When the time parameter is set

to 0.0, the system, without tuning, skips the sound tone relating to the system and tunes the other sound tone. The tuning sequence of sound tones is carried out in order of AUDIO 1, AUDIO 2, and AUDIO 3.

When we again depress on F 3 (CONF/SET) key while this screen is displayed, then the system enters the page whereon the parameters such as back lighting, printer's printout method and computer data transfer methods, are set.

```
BACKLIT= 00

PRINT= AUTO

MEMORY= AUTO

[      ] [NEXT] [NEXT] [SAVE]
         [PARM] [PAGE] [READ]
```
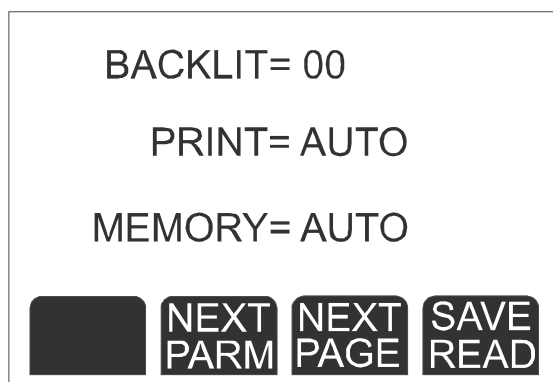
8.3. BACKLIT, PRINT MODE AND MEMORY MODE ADJUSTMENT

The BACKLIT parameter, on this screen, serves to indicate for how long the back lighting feature of screen, shall continue to illuminate after depressing any key in front of system. It can be set in the range any key of 0 to 99 seconds. If 0 (zero) is selected, then the back lighting function is cancelled. To keep the period of this parameter short enables the saving of power when the system is operated in its battery mode. While the system is directly connected to the mains supply line, the back lighting period continually goes on. By using the up arrow and (F2, NEXT/PARM) keys, the BACKLIT parameter can be set in the range of 0 to 99 seconds.

The PRINT function sets the printout format which as a result of any test, is displayed on the screen by the printer unit (sell separately) connected to the system. If the Auto function is selected, as soon as any test result appears on the screen, the printer unit also simultaneously prints it. If MANUAL function is selected, then in order to obtain a printout as soon as any test result appears, it is required to depress on ENTER key. This parameter can be set by depressing on up arrow and F2 (NEXT/PARM) keys.

MEMORY parameter, when any test result appears on the screen, sets the result recording format to the memory of the system. If AUTO function is selected, any test results, as soon as it appears on the screen, is also recorded to the system memory at that moment. If MANUAL Function is selected, then, in order to record any test results to the system memory as soon as this result comes, it is necessary to depress on ENTER key. This parameter can be set by depressing on up arrow and F2 (NEXT/PARM) keys.

When we again depress on F3, CONF/SET Key, this time there appears the setting page (last page) whereon the data displayed by the external score boards, take place and the volume of sound unit is adjusted.

```
SB 1 OUT = 0

SB 2 OUT = 0

AUDIO VOL= 00

[■] NEXT   NEXT   SAVE
    PARM   PAGE   READ
```
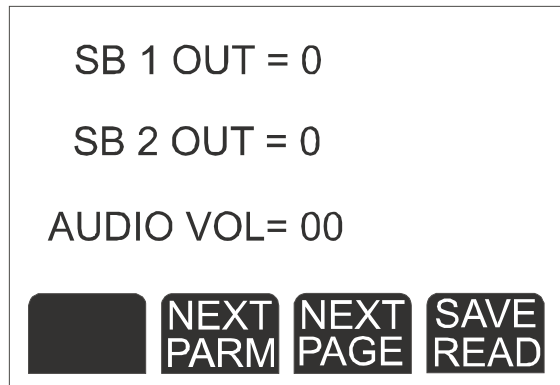
8.4. SCOREBOARD DATA AND AUDIO VOLUME ADJUSTMENT

On this section, the parameters of SB1 OUT and SB 2 OUT as well as the data to be displayed by the scoreboards attached to the main system (MPS-501) are selected. The definitions of such data, according to the relevant functions of this unit, are listed in the table indicated below.

SB 1 OUT SB 2 OUT	CHRONO	REACT	TIMER	JUMP	ANTHRO
0	Time 1	Elapsed time	Total number of performed shuttle runs	Total height jumped from beginning of test	Body weight (kg/lb)
1	Time 2	Number of attempts performed	Total distance run	Total number of jumps performed from beginning of test	Body height (cm/inches)
2	Time 3	# of attempts (2digit) + # of faults (2 digit)	Total time elapsed	Minimum jumping height (2 digit) + in which attempt has this height been achieved (2 digit)	Body mass index
3	Time4	Count down timer (2 digit) + # of faults (2 digit)	Total distance run and remaining time of shuttle run (Switching)	Maximum jumping height (2 digit) + in which attempt has this height been achieved (2 digit)	NA
4	Time1 and Time2	NA	Total shuttle run and	Count down timer	NA

(Switching)		remainging time of shuttle run (Switching)	(2 digit) + # of total jumps performed (2 digit)	
5	Last result, resetting in 5 seconds	NA	NA	# of total jumps performed (2 digit) + actual jump reformed (2 digit)	NA
6	Count Down Timer	Count Down Timer	Count Down Timer	Count Down Timer	Count Down Timer
7	Hour of Day	Hour of Day	Hour of Day	Hour of Day	Hour of Day
8	Temperature (Requires optional sensor)	Temperature (Requires optional sensor)	Temperature (Requires optional sensor)	Temperature (Requires optional sensor)	Temperature (Requires optional sensor)
9	Temperature / Time (Switching)	Temperature / Time (Switching)	Temperature / Time (Switching)	Temperature / Time (Switching)	Temperature / Time (Switching)

9. DATA STORAGE AND TRANSFER OPERATIONS:

MPS 501 unit has capability to store, send and receive personal data and test results to its internal memory. Up to 256 persons can be defined and up to 256 test results can be stored into memory.

There are three ways to enter personal data to MPS 501 main unit,

1. By using front panel keys of MPS 501 main unit (F2, UP and F3 keys)
2. By using external PS2 keyboard (supllied) directly connected to MPS 501 main unit
3. By using computer with RS232 connection between MPS main unit and computer with supplied computer program.

9.1. PERSONAL DATA ENTRY:

System must be set to main function page (CHRONO, REACT, TIMER, JUMP or ANTHRO) before attempting to enter SAVE/READ page.
When F4, SAVE/READ key is depressed on for the first time personal identification screen appears on the display.

```
            ID= 0000
    M.GR/S.GR.=
         NAME=
      SURNAME=
      AGE SEX=
                 0000/0000
    FIND   NEXT  SAVE  BACK
    DEL    PARM
```

Definitions of parameters appeared on SAVE/READ page. (See also computer software user's manual)

9.1.1. ID (Personal ID number):

That parameter has 4 digits and can be set between 0001 to 9999. This is a special parameter that is specific to only one person, it is used for differenciating persons from each other and especially used for matching results with computer program while transferring results to computer. ID parameter can be entered manually or can be transferred from computer program as a part of complete list of personal data. Also ID parameter is used for searching and finding single person in the memory for apllying tests and record results for that person. For that purpose it is also possible to use barcode scanner (supplied) and preprinted barcode list prepared by using computer software. User should also transfer prepared list from computer to MPS 501 main unit's memory before using barcode scanner and preprinted barcode list.

9.1.2. M.GR. / S.GR. (Main group and sub group):

These two parameters are general parameters and are used for groupping persons for further filtering operations in computer program. Both parameters have 1 digit and can be set between 0 to 9. These parameters can be entered manually or can be transferred from computer program as a part of complete list of personal data. These two parameters can be used for differentiating several groups of persons from each other for further analysis of test results. For example these parameters can be set in computer software as follows,

MAIN GROUP	SUB GROUP
1. BASKETBALL	1. GIRLS 2. BOYS
2. FOOTBALL	1. JUNIORS GIRL 2. JUNIORS BOY 3. SENIORS GIRL 4. SENIORS BOY

3. TRACK & FIELD	1. JAVELIN 2. DISCUS 3. HIGH JUMP 4. SPRINTER
4. WRESTLING	1. 50 KG 2. 60 KG 3. 70 KG 4. 80 KG 5. 90 KG 6. HEAVY
5. HIGH SCHOOL	1. FIRST YEAR BOY 2. FIRST YEAR GIRL 3. SECOND YEAR BOY 4. SECOND YEAR GIRL 5. THIRD YEAR BOY 6. THIRD YEAR GIRL 7. …ETC

Above list of settings is only for example purpose and can be assigned to anything in computer software. They can be seen only as numbers in MPS 501 main unit's display. For example, M.GR. / S.GR.= 5 / 3.

9.1.3. NAME

This parameter is the name of the person. It can be defined up to 10 characters long. This parameter can be entered manually or can be transferred from computer program as a part of complete list of personal data.

9.1.4. SURNAME

This parameter is the surname of the person. It can be defined up to 10 characters long. This parameter can be entered manually or can be transferred from computer program as a part of complete list of personal data.

9.1.5. AGE & SEX

This parameter is the age and gender of the person. Age can be defined between 00 to 99 and sex can be defined as M (Male) or F (Female). These parameters can be entered manually or can be transferred from computer program as a part of complete list of personal data.

9.2. SETUP OF PARAMETERS ASSOCIATED WITH SAVE/READ PAGE:

9.2.1. USING FRONT PANEL KEYS OF MAIN UNIT

(F2, UP AND F3 KEYS). When this screen appears for the first time, the first character of ID parameter appears on the black background. The up arrow is depressed on in order to change the character and this key is held depressed untill the desired value is reached. When the desired value is reached, then depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character of ID starts to appear on the black background. The up arrow is depressed on in order to change the character and this key is held depressed until the desired value is reached. This procedure is repeated until all 4 digits adjusted to desired value.

```
         ID= 1234
   M.GR/S.GR.=
         NAME=
     SURNAME=
     AGE SEX=
                 0000/0000
   FIND  NEXT  SAVE  BACK
   DEL   PARM
```

When ID definition is completed, it is possible to search for this ID in memory for availibility in order to avoid over write on that record. In order to search for that ID in memory, press ENTER button and wait. If there is a record founded which has the same ID that entered, then on the display area all the parameters, M.GR. / S.GR., NAME, SURNAME and AGE & SEX, will be filled with prerecorded values of entered ID number.

```
         ID= 1234
   M.GR/S.GR.= 3 / 4
         NAME= JOHN
     SURNAME= SMITH
     AGE SEX= 24   M
                 0025/0000
   FIND  NEXT  SAVE  BACK
   DEL   PARM
```

On the other hand, if there is no record available in memory with mentioned ID number, then on the left of display there will be FREE word appears and rest of the parameters remains blank.

```
                ID= 123▉
        M.GR/S.GR.=
             NAME=
         SURNAME=
          AGE SEX=
    FREE          0257/0000
    ┌─────┐┌─────┐┌─────┐┌─────┐
    │FIND ││NEXT ││SAVE ││BACK │
    │DEL  ││PARM ││     ││     │
    └─────┘└─────┘└─────┘└─────┘
```

If defined ID number is free in memory, then it is possible to define the rest of the parameters and save the personal data into memory.

In order to define the next parameter M.GR./S.GR. (Main group and sub group) press F2 button until black background moves to first character of this parameter   (▉ / 0). The up arrow is depressed on in order to change the character and this key is held depressed untill the desired value is reached. When the desired value is reached, then depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character of parameter starts to appear on the black background (0 / ▉). The up arrow is depressed on in order to change the character and this key is held depressed until the desired value is reached.

```
                ID= 1234
        M.GR/S.GR.=  3  /  6
             NAME= ▉
         SURNAME=
          AGE SEX=
                      0000/0000
    ┌─────┐┌─────┐┌─────┐┌─────┐
    │FIND ││NEXT ││SAVE ││BACK │
    │DEL  ││PARM ││     ││     │
    └─────┘└─────┘└─────┘└─────┘
```

In order to define the next parameter NAME, press F2 button until black background moves to first character of this parameter. The up arrow is depressed on in order to change the character and this key is held depressed untill the desired value is reached. Order of characters in this parameter starts with numbers, 0 to 9 that change every time UP button depressed, after reached to number 9 letters are started to display. Letters are changed from A to Z, and changes every time depressing UP button. After reaching to letter Z numbers are start again and continues to change as a loop of numbers and letters. When the desired value is reached, then depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character of parameter starts to appear on the black background. The up arrow is depressed on in order to change the character and this key is held depressed until the desired value is reached. Repeat this procedure until name entry completed (Max. 10 characters). If

number of characters are less than 10, then depress F2 button until next line's (SURNAME) first characters appears on black background.

```
            ID= 1234
     M.GR/S.GR.=  3  /  6
          NAME= JOHN
       SURNAME= ▮
        AGE SEX=
                    0000/0000
    ┌─────┐┌─────┐┌─────┐┌─────┐
    │FIND ││NEXT ││SAVE ││BACK │
    │DEL  ││PARM ││     ││     │
    └─────┘└─────┘└─────┘└─────┘
```

In order to define the next parameter SURNAME, UP arrow button is depressed on in order to change the character and this key is held depressed untill the desired value is reached. Order of characters in this parameter starts with numbers, 0 to 9 that change every time UP button depressed, after reached to number 9 letters are started to display. Letters are changed from A to Z, and changes every time depressing UP button. After reaching to letter Z numbers are start again and continues to change as a loop of numbers and letters. When the desired value is reached, then depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character of parameter starts to appear on the black background. The up arrow is depressed on in order to change the character and this key is held depressed until the desired value is reached. Repeat this procedure until name entry completed (Max. 10 characters). If number of characters are less than 10, then depress F2 button until next line's (AGE SEX) first characters appears on black background.

```
            ID= 1234
     M.GR/S.GR.=  3  /  6
          NAME= JOHN
       SURNAME= SMITH
        AGE SEX= ▮0    M
                    0000/0000
    ┌─────┐┌─────┐┌─────┐┌─────┐
    │FIND ││NEXT ││SAVE ││BACK │
    │DEL  ││PARM ││     ││     │
    └─────┘└─────┘└─────┘└─────┘
```

In order to define the next parameter AGE   SEX. The up arrow is depressed on in order to change the character and this key is held depressed untill the desired value is reached. When the desired value is reached, then depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character of parameter starts to appear on the black background (0▮). The up arrow is depressed on in

order to change the character and this key is held depressed until the desired value is reached. After AGE parameter is defined then depress on F2 (NEXT / PARM) key in order to set the last parameter SEX, up arrow is depressed on in order to change the value from M (Male) to F (Female). Every time UP arrow depressed value is changed M to F and F to M.

After completing to setup all personal parameters, in order to save all of them into memory F3 (SAVE) key depressed and personal data is saved with defined ID into memory.

In order to check process, it is possible to enter ID one more time and depress ENTER button. If data is recorded then screen will be recovered with predefined parameters belongs to that ID. If not, screen will be blank and there is a FREE word appears on the lower left of screen.

For recording another person into memory following to last one, again depress F2 key until first digit of ID appears on black background and follow steps from beginning described in this section.

9.2.2. USING EXTERNAL PS2 KEYBOARD (SUPLLIED)

Before starting this process, supplied keyboard must be connected to the MPS 501 main unit. In order to connect keyboard to MPS 501 main unit, it is necessary to insert keyboard's connector (male) to MPS 501's keyboard connector (female) placed at the back panel. Before making connection please turn off the MPS 501 main unit. (see figure below) MPS 501 main units back panel keyboard connector type is an AT type keyboard connector. Supplied keyboard is PS2 type keyboard with PS2 type keyboard connector. In order to connect PS2 type keyboard to MPS 501 main unit there is also a connector adapter supplied with keyboard. That adapter is directly mounted on the PS2 keyboard's connector during shipment.

Rear Panel of
MPS 501 Main System
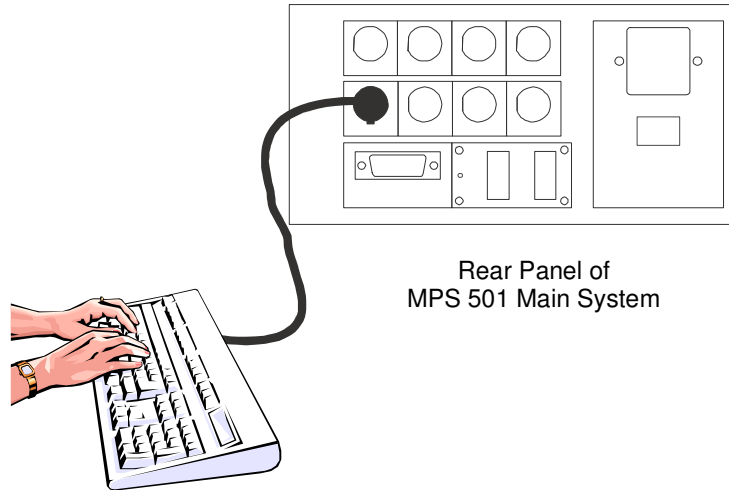
There is a limitation to use some keys of the keyboard. Active keys of the keyboard are as follows,

NUMBER KEYS (See figure below)	0 1 2 3 4 5 6 7 8 9
CHARACTER KEYS (See figure below)	Q W E R T Y U I O P　　　(First row) 　A S D F G H J K L　　　(Second row) 　　Z X C V B N M　　　(Third row)
ESC Key (See figure below)	Returns cursor to home position. First digit of ID.
ENTER key (See figure below)	Moves cursor to next line.

Other keys of the keyboard are not active and there will be no response when they depressed.

Avilable keys for MPS 501 main unit

ESC key for
return to
home position

Numeric keys for number input

SPACE keys for blank character

Character keys for character input

ENTER key for moving to next line

ID= 1234
M.GR/S.GR.= 0 / 0
NAME= JOHN
SURNAME= SMITH
AGE SEX= 23   M
0000/0000
FIND NEXT SAVE BACK
DEL   PARM

ID= 1234
M.GR/S.GR.= 0 / 0
NAME= JOHN
SURNAME= SMITH
AGE SEX= 23   M
0000/0000
FIND NEXT SAVE BACK
DEL   PARM
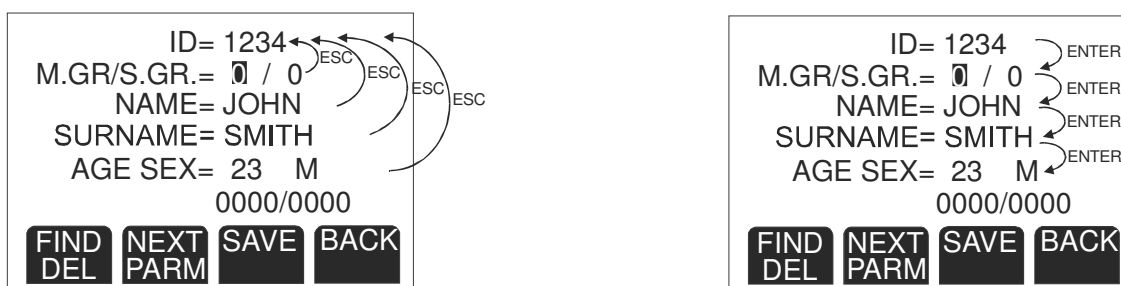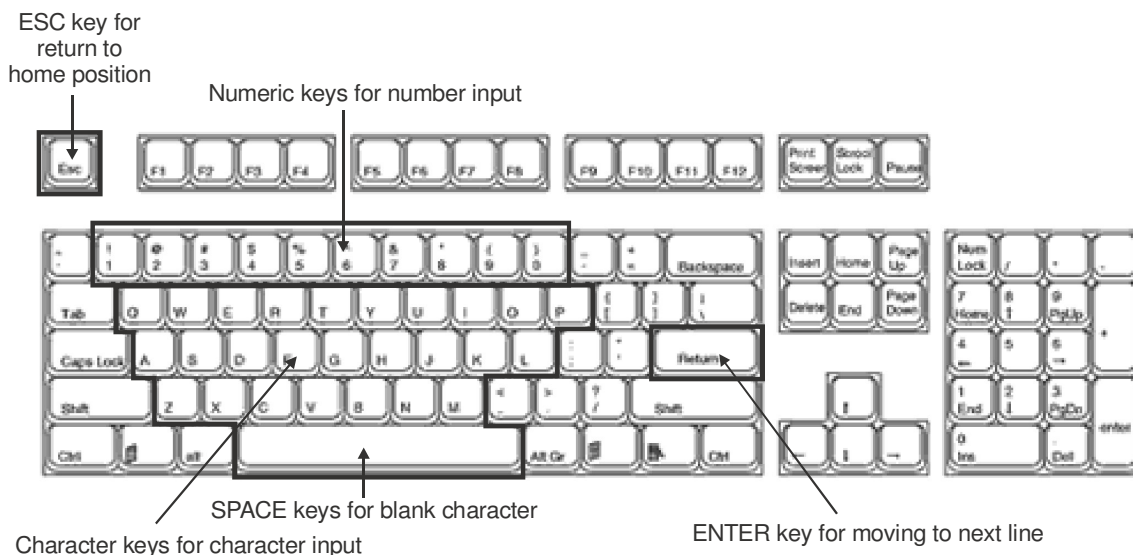
Function of ESC and ENTER keys on PS2 keyboard

After keyboard connected, then turn on MPS 501 main unit. When CHRONO function appears on display, press F4 (SAVE/READ) button for changing display to personal identification page. When this screen appears for the first time, the first character of ID parameter appears on the black background. In order to write desired ID number, use number keys placed on the upper part of keyboard (see figure above). Every time a key pressed, the black background is moved to right side of the row. Repeat it until 4 digits completed and black background moved to first digit of lower line (M.GR. / S.GR.). Numeric keypad (placed on the right side of keyboard) is not active and will have no response when pressed.

```
              ID= 1234
M.GR/S.GR.=  0 / 0
           NAME=
      SURNAME=
     AGE SEX=  00   M
                    0000/0000
  FIND  NEXT  SAVE  BACK
  DEL   PARM
```

When ID definition is completed, it is possible to search for this ID in memory for availibility in order to avoid over write on that record. In order to search for that ID in memory, press ENTER button placed on front panel of MPS 501 main unit (not on keyboard) and wait. If there is a record founded which has the same ID that entered, then on the display area all the parameters, M.GR. / S.GR., NAME, SURNAME and AGE & SEX, will be filled with prerecorded values of entered ID number.

```
              ID= 1234
M.GR/S.GR.= 3 / 4
           NAME= JOHN
      SURNAME= SMITH
     AGE SEX= 24   M
                    0025/0000
  FIND  NEXT  SAVE  BACK
  DEL   PARM
```

On the other hand, if there is no record available in memory with mentioned ID number, then on the left of display there will be FREE word appears and rest of the parameters remains blank.

```
              ID= 1234
M.GR/S.GR.=
           NAME=
      SURNAME=
     AGE SEX=
FREE              0257/0000
  FIND  NEXT  SAVE  BACK
  DEL   PARM
```

If defined ID number is free in memory, then it is possible to define the rest of the parameters and save the personal data into memory.

In order to define the next parameter M.GR./S.GR. (Main group and sub group) use PS2 keyboards numeric keys to enter desired number. Every time a key is pressed, black backgrounded cursor is moved to next position and next parameter is ready for setting. When second parameter is set then black backgrounded cursor is moved to first character of NAME parameter.
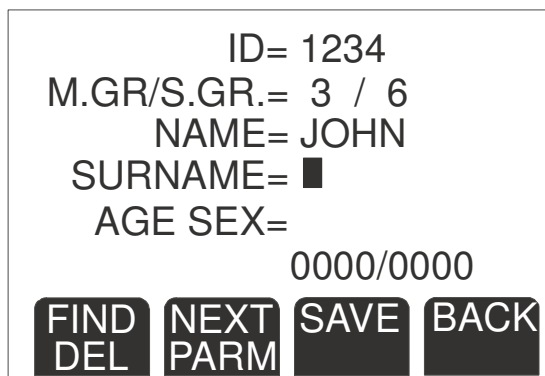
```
          ID= 1234
M.GR/S.GR.=  3 / 6
       NAME= ■
   SURNAME=
   AGE SEX=
                0000/0000
 FIND  NEXT  SAVE  BACK
 DEL   PARM
```

In order to define the next parameter NAME, use PS2 keyboards numeric and character keys to enter desired number or character. Every time a key is pressed, black backgrounded cursor is moved to next position and next parameter is ready for setting. Repeat this procedure until name entry completed (Max. 10 characters). If number of characters are less than 10, then depress SPACE key on the keyboard or use ENTER key on the PS2 keyboard (Not on MPS 501 main unit's front panel) until next line's (SURNAME) first characters appears on black background.

```
          ID= 1234
M.GR/S.GR.=  3 / 6
       NAME= JOHN
   SURNAME= ■
   AGE SEX=
                0000/0000
 FIND  NEXT  SAVE  BACK
 DEL   PARM
```

In order to define the next parameter SURNAME, use PS2 keyboards numeric and character keys to enter desired number or character. Every time a key is pressed, black backgrounded cursor is moved to next position and next parameter is ready for setting. Repeat this procedure until surname entry completed (Max. 10 characters). If number of characters are less than 10, then depress SPACE key on the keyboard or use ENTER key on the PS2 keyboard (Not on MPS 501 main unit's front panel) until next line's (AGE SEX) first characters appears on black background.

```
                ID= 1234
      M.GR/S.GR.=  3  /  6
             NAME= JOHN
         SURNAME= SMITH
       AGE SEX=  00   M
                    0000/0000
    FIND  NEXT  SAVE  BACK
    DEL   PARM
```
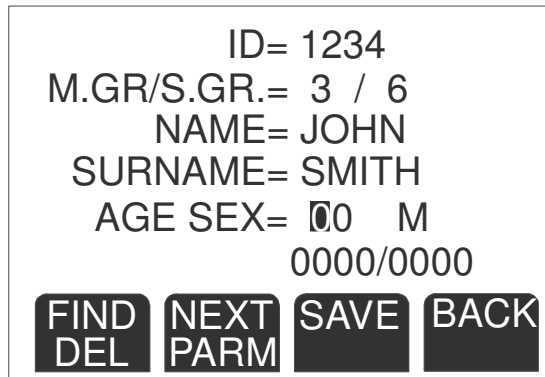
In order to define the next parameter AGE SEX, use PS2 keyboards numeric keys to enter desired number. Every time a key is pressed, black backgrounded cursor is moved to next position and next parameter is ready for setting. When second parameter is set then black backgrounded cursor is moved to character of SEX parameter.

In order to set the last parameter "SEX", press "S" on the PS2 keyboard. Every time "S" is pressed value is changed from M (Male) to F (Female). After completing to setup all personal parameters, in order to save all of them into memory depress F3 (SAVE) key on the MPS 501 main units front panel (Not on PS2 keyboard) and personal data is saved with defined ID into memory.

In order to check process, it is possible to enter ID one more time and depress ENTER button on MPS 501 main unit's front panel (Not on PS2 keyboard). If data is recorded then screen will be recovered with predefined parameters belongs to that ID. If not, screen will be blank and there is a FREE word appears on the lower left of screen.

For recording another person into memory following to last one, depress ESC key on the PS2 keyboard. ESC key returns cursor to first character of ID parameter and then follow steps from beginning described in this section.

9.2.3. USING COMPUTER WITH RS232 CONNECTION

The best and easiest way to define and load personal settings is to use computer with RS232 connection between MPS main unit and computer with supplied computer program. (See also computer software user's manual). Please refer to computer software user manual (Section 9 in this manual) for how to prepare lists and how to transfer them to MPS 501 main unit.

After competing list and get ready for transferring list from computer to MPS 501 main system in computer software, bring SAVE/READ page on

the screen and then press F1 button (FIND/DEL) on the front panel of MPS 501 main unit, the display part placed just above F1 button is changed to (SEND/DATA) and upper part of the display "PRESS ENTER" will displayed. Then press one more time to F1 button, this time the display part placed just above F1 button is changed to (RECV/DATA) and upper part of the display will be the same as "PRESS ENTER".

Prepared list for transferring to MPS 501 main unit must be ready on the computer before completing this step (Section 9.3.3). Follow the directions placed in dialogue box on computer software.
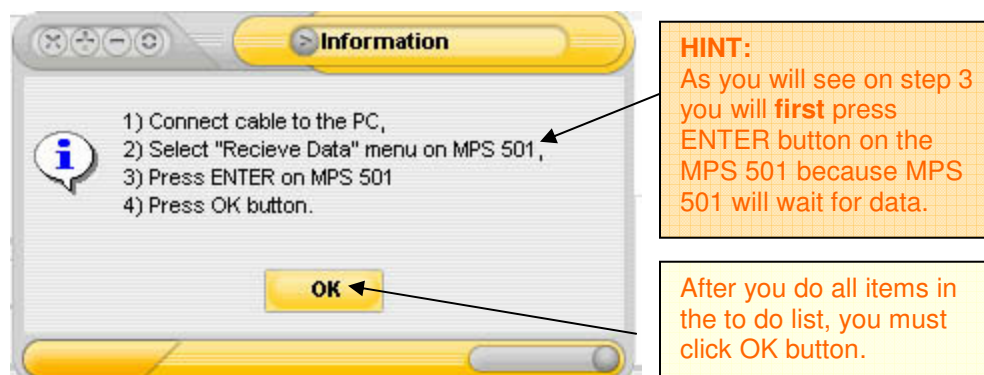
When "ENTER" button placed on front panel on MPS 501 is pressed, the device will wait for data. And when you press OK button on the message window, the window will be closed and sportsman information on the "SELECTED LIST" will be sent to MPS 501. While sending data a progress message window will be seen.
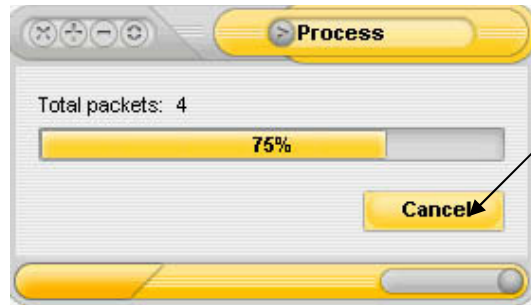
If you want to cancel the "Send Data" process, you can click "Cancel" button. Status will be "Ready".

When Data sending finished, "COMPLETED" message will be seen on MPS 501 and number of persons transferred is displayed.
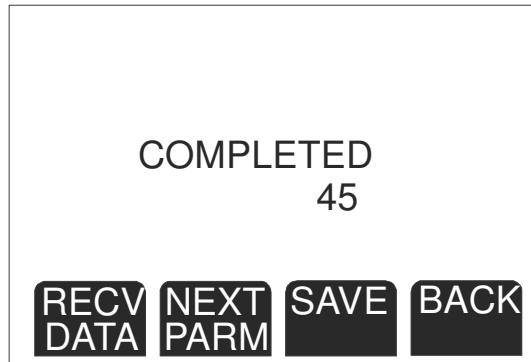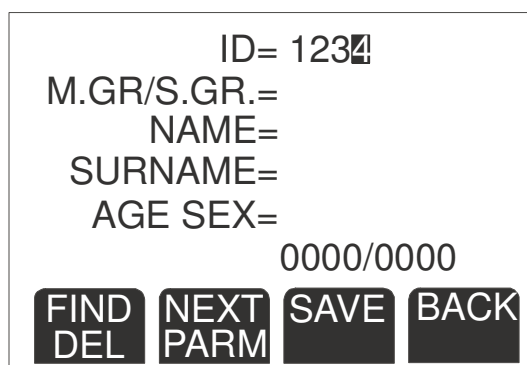
In order to turn back to FIND/DEL page, press F1 button until FIND/DEL page is displayed. In order to check process, it is possible to enter a known ID and depress ENTER button on MPS 501 main unit's front panel. If data is recorded then screen will be recovered with predefined parameters belongs to that ID. If not, screen will be blank and there is a FREE word appears on the lower left of screen.

In case of interruption of transfer process or mulfunction, turn off MPS 501 main unit from back switch and wait for 10-15 secs. Then turn on MPS 501 main unit and repeat process from beginning.

9.3. SEARCH FOR PERSONAL ID PARAMETERS SAVED INTO MEMORY

9.3.1. USING FRONT PANEL KEYS (F2, UP AND ENTER KEYS):

When SAVE/READ screen appears for the first time, the ID number that will be searched must be entered. In order to search ID number, four character of ID parameter must be set. First character appeared on black background is set to desired value by pressing the up arrow key placed in front panel of MPS 501 main unit. When the desired value is reached, then depress on F2 (NEXT / PARM) key in order to enter the next character. In this case, the second character of ID starts to appear on the black background. The up arrow is depressed on in order to change the character and this key is held depressed until the desired value is reached. This procedure is repeated until all 4 digits adjusted to desired value.

```
               ID= 1234
      M.GR/S.GR.=
            NAME=
         SURNAME=
         AGE SEX=
                    0000/0000
      FIND  NEXT  SAVE  BACK
      DEL   PARM
```
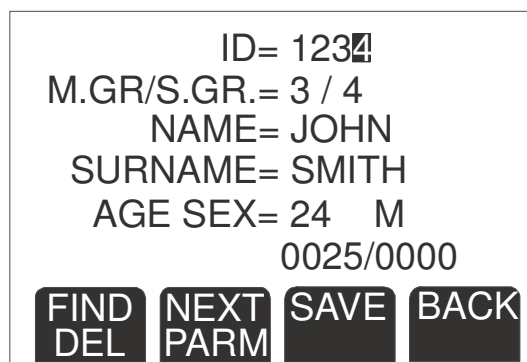
When ID definition is completed, in order to search for this ID in memory, press ENTER button and wait. If there is a record founded which has the same ID that entered, then on the display area all the parameters, M.GR. / S.GR., NAME, SURNAME and AGE & SEX, will be filled with prerecorded values of entered ID number.

```
               ID= 1234
      M.GR/S.GR.= 3 / 4
            NAME= JOHN
         SURNAME= SMITH
         AGE SEX= 24   M
                    0025/0000
      FIND  NEXT  SAVE  BACK
      DEL   PARM
```

After that point, all the test results are recorded with this ID into internal memory and all data placed in this screen together with test results printed if printer is connected and printout mode is set auto.

On the other hand, if there is no record available in memory with mentioned ID number, then on the left of display there will be FREE word appears and rest of the parameters remains blank.

```
                ID= 1234
       M.GR/S.GR.=
             NAME=
          SURNAME=
          AGE SEX=
       FREE          0257/0000
       FIND  NEXT  SAVE  BACK
       DEL   PARM
```

After that point, all the test results are recorded with ID=0000 into internal memory and test results printed with ID=0000 and other parameters (M.GR, S.GR, NAME, SURNAME, AGE and SEX) remains blank when printer is connected and printout mode is set auto.

9.3.2. USING EXTERNAL PS2 KEYBOARD (SUPPLIED)

After connect keyboard (See section 8.2.2 for details) then turn on MPS 501 main unit. When CHRONO function appears on display, press F4 (SAVE/READ) button for changing display to personal identification page. When this screen appears for the first time, the first character of ID parameter appears on the black background. In order to write desired ID number, use number keys placed on the upper part of keyboard (see section 8.2.2 for details). Every time a key pressed, the black background is moved to right side of the row. Repeat it until 4 digits completed and black background moved to first digit of lower line (M.GR. / S.GR.). Numeric keypad (placed on the right side of keyboard) is not active and will have no response when pressed.

```
                ID= 1234
       M.GR/S.GR.= 0  /  0
             NAME=
          SURNAME=
          AGE SEX=  00    M
                     0000/0000
       FIND  NEXT  SAVE  BACK
       DEL   PARM
```

When ID definition is completed, in order to search for that ID in memory, press ENTER button placed on front panel of MPS 501 main unit (not on keyboard) and wait. If there is a record founded which has the same ID

that entered, then on the display area all the parameters, M.GR. / S.GR., NAME, SURNAME and AGE & SEX, will be filled with prerecorded values of entered ID number.

```
              ID= 1234
   M.GR/S.GR.= 3 / 4
          NAME= JOHN
      SURNAME= SMITH
      AGE SEX= 24   M
                    0025/0000
   FIND  NEXT  SAVE  BACK
   DEL   PARM
```

After that point, all the test results are recorded with this ID into internal memory and all data placed in this screen together with test results printed if printer is connected and printout mode is set auto.

On the other hand, if there is no record available in memory with mentioned ID number, then on the left of display there will be FREE word appears and rest of the parameters remains blank.

```
              ID= 1234
   M.GR/S.GR.=
          NAME=
      SURNAME=
      AGE SEX=
   FREE         0257/0000
   FIND  NEXT  SAVE  BACK
   DEL   PARM
```

After that point, all the test results are recorded with ID=0000 into internal memory and test results printed with ID=0000 and other parameters (M.GR, S.GR, NAME, SURNAME, AGE and SEX) remains blank when printer is connected and printout mode is set auto.

9.3.3. USING EXTERNAL BARCODE READER (SUPPLIED)

Before starting this process, supplied barcode reader must be connected to the MPS 501 main unit. In order to connect barcode reader to MPS 501 main unit, it is necessary to insert barcode reader's connector (male) to MPS 501's keyboard connector (female) placed at the back panel. Barcode reader has two connectors at the end of its cable. One of them is used for connecting barcode reader to MPS 501 main unit and the other one is used for connecting PS2/AT type keyboard to MPS 501 main unit at the same time with barcode reader. MPS 501 main unit's keyboard connector is an AT type keyboard connector. Supplied barcode reader has PS2 type keyboard connector. In order to connect barcode reader to MPS 501 main unit there is also a connector adapter supplied with barcode reader and keyboard (they use the same adapter).

It is possible to use both PS2 type keyboard and barcode reader at the same time. But in that case system's operation time with battery is reduced. On the other hand, working as connected to mains supply doesn't effects system's operation. When both keyboard and barcode reader is connected at the same time to the MPS 501 main unit, it is normal to heat more of the system's case than when they are not connected.

Rear Panel of
MPS 501 Main System

AT type keyboard
connection socket
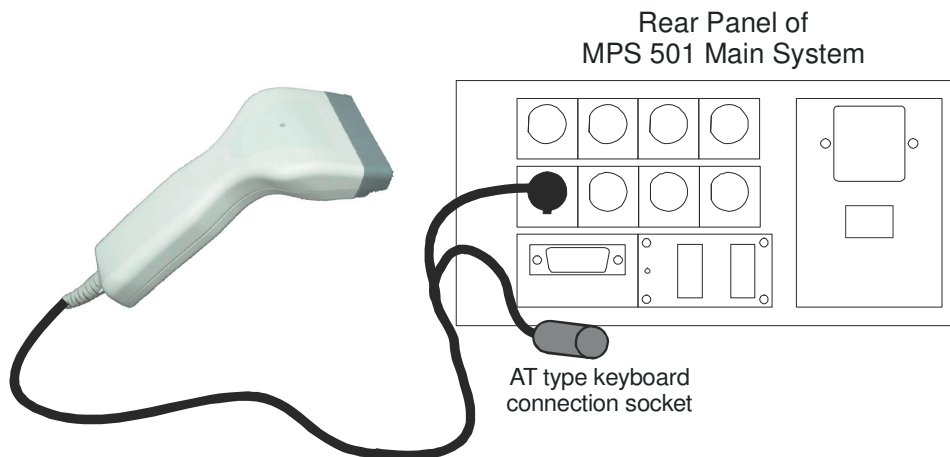
After completing the connection of barcode reader, turn on the system and select , SAVE/READ screen by pressing F4 on the front panel of MPS 501 main screen. First digit of ID will be on black background. In order to find preloaded ID's, use preprinted barcode list or parsonal cards (See section 9.5, 9.6 and 9.7 for how to prepare and print barcode lists and personal cards).
For scanning barcodes from printed list or personal card, move top front part of barcode reader (as close as possible, max 2-3 cm) to barcode placed on paper or badge parallel to direction of printed barcode and depress the button placed under the barcode reader. There will be red

light that illuminate to printed barcode and when barcode is readed correctly, a sound will be heard.

At that moment, ID will be appeared on MPS 501 main unit's LCD display. After that, press ENTER button placed on front panel of MPS 501 main unit. The data belongs to that ID (M.GR, S.GR, NAME, SURNAME, AGE and SEX) will be seen on LCD display.

After that point, all the test results are recorded with this ID into internal memory and all data placed in this screen together with test results printed if printer is connected and printout mode is set auto.

9.4. SAVING TEST RESULTS TO INTERNAL MEMORY

The parameters associated with this function are,

<div align="center">

MEMORY=AUTO or MEMORY=MANUAL

</div>

Placed on 3rd setup page (See section 7.3 for how to seup)

and personal identification setup page (See section 8.2 for how to seup).

```
          ID= 1234
  M.GR/S.GR.= 3 / 4
         NAME= JOHN
     SURNAME= SMITH
     AGE SEX= 24   M
                 0025/0000
  FIND  NEXT  SAVE  BACK
  DEL   PARM
```

In order to save test results to memory, two above metioned parameters must be set properly before tests performed.

The most important setup for this function is MEMORY mode. If MEMORY mode set to AUTO, then all test results are saved into memory automatically as soon as tests ended. If MEMORY mode is set to MANUAL, then test results are not saved into memory automatically as soon as tests ended, instead user should press ENTER button placed in front panel of MPS 501 main unit in order to save result into memory.

It is also important to bring personal identification parameters of person under test to the SAVE/READ screen. All the test results are saved, based on reference to that data. In other words, user should set these parameters everytime, before starting to test new person with new person's original data. Please refer to section 8.2 and

section 8.3, for how to define and search personal identification parameters of persons.
If these settings forgotten or wrong personal ID data placed on the SAVE/READ screen, then test results will be saved with blank ID data or with wrong person's data. Do not forget to change personal data before starting to test new person.

9.5. REWIEVING TEST RESULTS

Saved results cannot be rewieved on the MPS 501 main unit, in order to rewiev or check test results saved data must transferred to computer (See section 8.6, for how to transfer saved test results to computer).

9.6. TRANSFERRING TEST RESULTS TO COMPUTER

After all the tests have been completed the data stored into the MPS 501 main unit can be transferred to computer for further analysis with supplied computer program.
In order to transfer test results saved to internal memory to computer, bring SAVE/READ page on the screen and then press F1 button (FIND/DEL) on the front panel of MPS 501 main unit, the display part placed just above F1 button is changed to (SEND/DATA) and upper part of the display "PRESS ENTER" will displayed.

PRESS ENTER

| SEND DATA | NEXT PARM | SAVE | BACK |

After that step, computer program must be prepared for receive data from MPS 501 main unit (see section 9. ,for how to recive data).
On computer software, press "GET DATA" button,
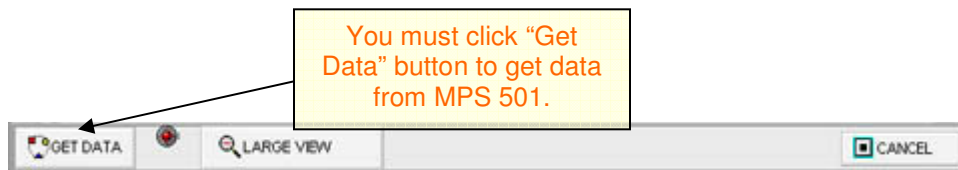
You must click "Get Data" button to get data from MPS 501.

GET DATA   LARGE VIEW   CANCEL

On "GET DATA" section by clicking the "GET DATA" button, the user is warned by a message box. The steps are as follows,
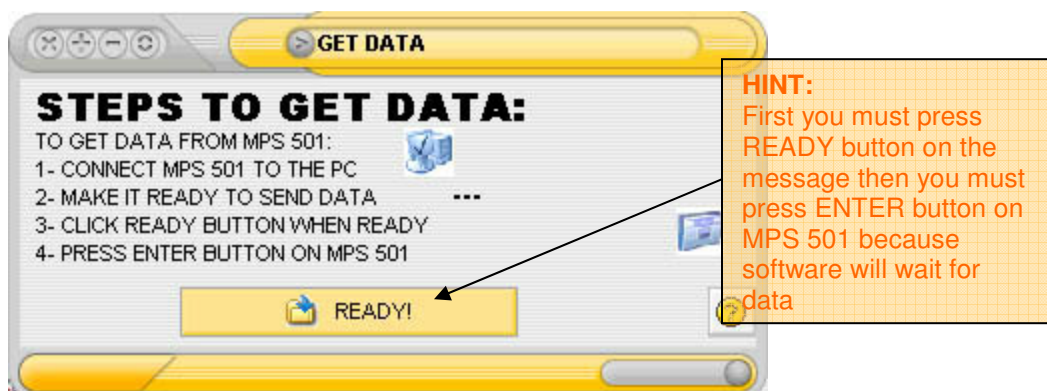
After cable is connected (Serial port connection), "Send Data" menu must be selected on MPS 501. Then "READY" button on the message box must be clicked. After these steps, software will be waiting for data that MPS 501 will send. Another message window with "Please wait" message will be seen on the screen.

Before ENTER is pressed on MPS 501   After ENTER is pressed on MPS 501

At that time "ENTER" button on MPS 501 must be pressed. Data will be received by software. Timeout occurs if no data is received.
When process is completed, received person information and results will be written to the "Received data" grid.

When Data sending finished, "COMPLETED" message will be seen on MPS 501.

```
COMPLETED


SEND  NEXT  SAVE  BACK
DATA  PARM
```

In order to turn back to FIND/DEL page, press F1 button until FIND/DEL page is displayed.

In case of interruption of transfer process or mulfunction, turn off MPS 501 main unit from back switch and wait for 10-15 secs. Then turn on MPS 501 main unit and repeat process from beginning.

9.7. CLEARING ALL DATA AND RESULTS MEMORY OF MPS 501 MAIN UNIT

After sending all saved test results to computer, before transferring a new list from computer, internal memory of MPS 501 main unit must be cleared. In order to clear MPS 501 main unit's internal memory, bring SAVE/READ page on the screen and then press F1 button (FIND/DEL) on the front panel of MPS 501 main unit, the display part placed just above F1 button is changed to (SEND/DATA) and upper part of the display "PRESS ENTER" will displayed. Press one more time to F1 button, this time the display part placed just above F1 button is changed to (RECV/DATA) and upper part of the display will be the same as "PRESS ENTER". Press one more time to F1 button, this time the display part placed just above F1 button is changed to (CLR/MEMO) and upper part of the display will be the same as "PRESS ENTER".

```
PRESS ENTER


CLR   NEXT  SAVE  BACK
MEMO  PARM
```

When ENTER key placed on front panel of MPS 501 main unit is pressed upper part of LCD screen is changed from "PRESS ENTER" to "PLEASE WAIT" and there is progression bar moving from left to right apears.

PLEASE WAIT

CLR
MEMO   NEXT
PARM   SAVE   BACK
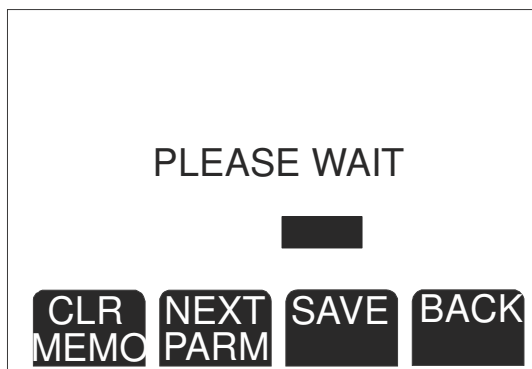
When all memory is cleared (it may take few minutes to clear all memory) upper part of LCD screen is changed from "PLEASE WAIT" to "COMPLETED" and progression bar has stopped.
In order to turn back to FIND/DEL page, press F1 button once, and FIND/DEL page will be displayed.

10. SPORT EXPERT INFORMATION SYSTEM SOFTWARE:

10.1. GENERAL INFORMATION
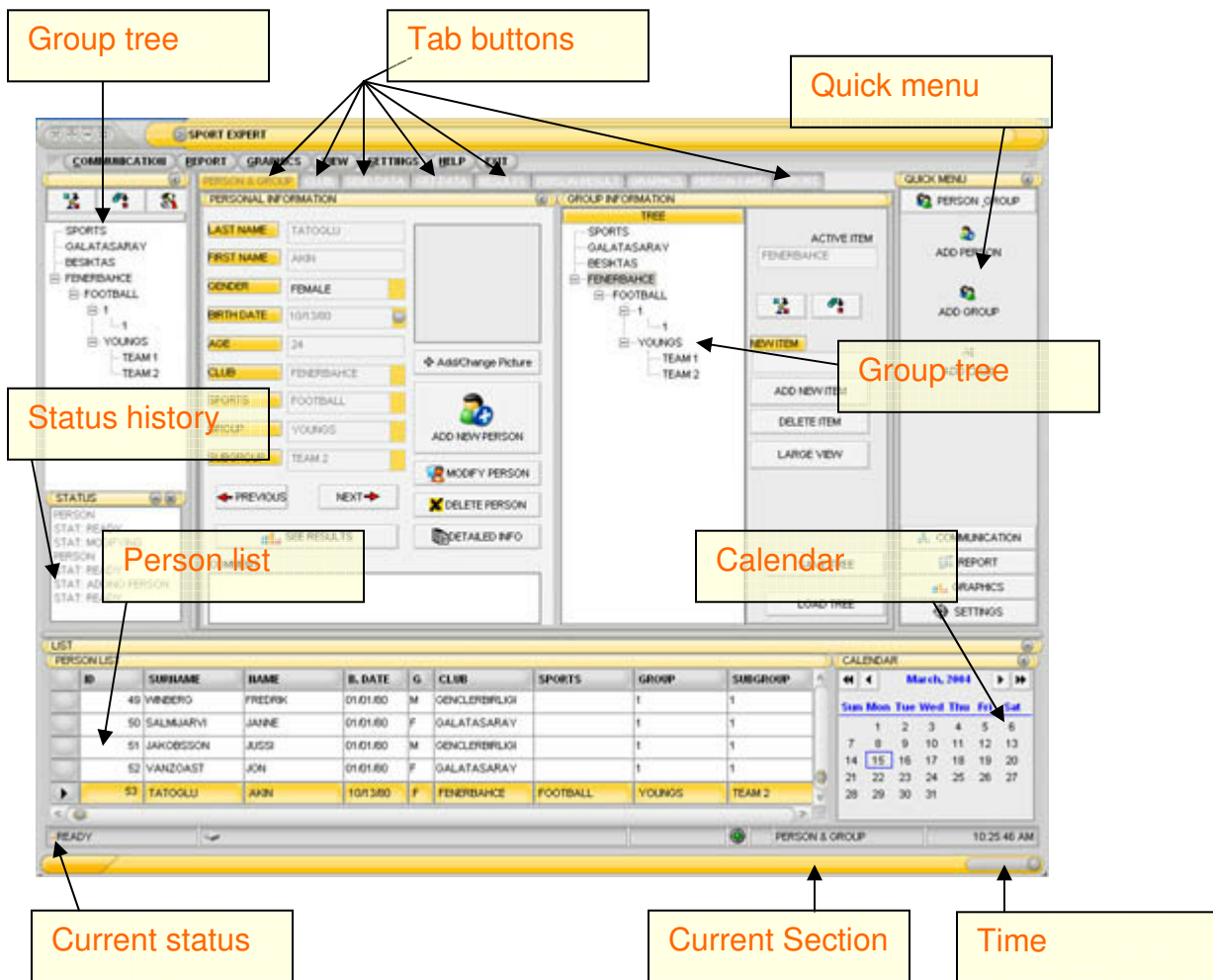
10.1.1.　TAB BUTTONS

Tab buttons are used to move between sections. Every tab represents a section such as Person and Group operations, Sending data, graphics etc.

10.1.2.　GROUP TREE:

Group Tree includes the list of groups. Every level is defined as:

⊟·· CLUB
　　⊟·· SPORTS.
　　　　⊟·· GROUP
　　　　　 ⋯ SUBGROUP

Item at Level 1 represents definition of a club. This means to create a sub tree a new club definition must be entered and every club may have Sports, Group and subgroup sub items.

10.1.3.　PERSON LIST

This part is a grid and consists all sportsman recorded to the system. Most of the operations are related to this part.

10.1.4.　STATUS

The status defines what the user is doing at that time. To change a status user must see the "Ready" on the status bar. Ready represents "no operation" so any operation can be done.
When user doing an operation (i.e. Adding Person), if "SAVE" or "CANCEL" button is clicked then status would be "READY". Or if the user tries to change the section (if clicks another tab button) a message will warn her/him to proceed what to do.

10.1.5.　STATUS BAR

- The status bar has five parts:
- First part represents "Current Status". (Ready)
- Second Part represent the size of data transmitted or received due to the communication. (Size: 0 byte)
- Third part represents if query is on or off. (Query: Off)
- Fourth part represents the current section. (Send Data)
- Fifth part represents the time.

Left part of the status bar
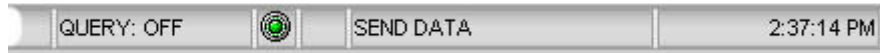
Right part of the status bar

Total part

10.1.6.   QUICK MENU
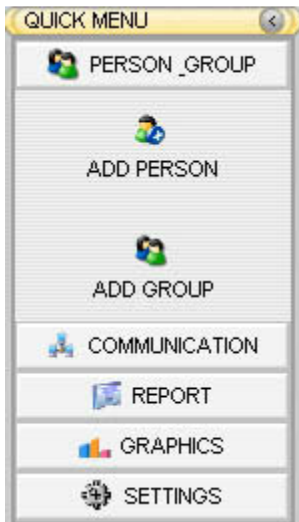
With quick menu user would have the ability to access sections and properties easily.

10.1.7.   VIEW MENU

On the pull down menu the choice "VIEW" is useful for different view styles.

- • View menu includes:
- • Large View: Tree on the left and "Quick menu" frames are

invisible.
- Normal view: Default view of the screen (all frames visible)
- Only tabs: Only the main part under tab buttons is visible.
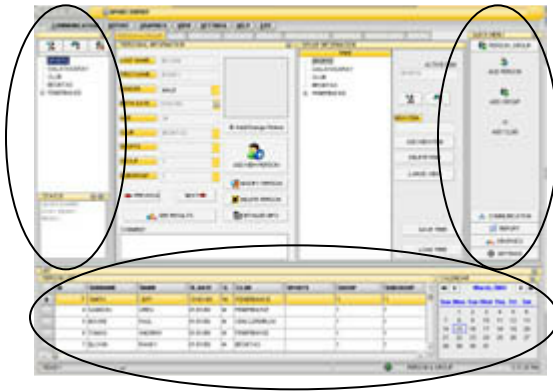
a. Normal View (all three parts are visible)
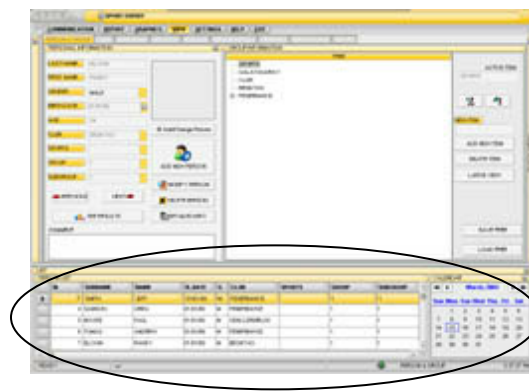
b. Large View (only one of the three parts – 'person list ' visible)
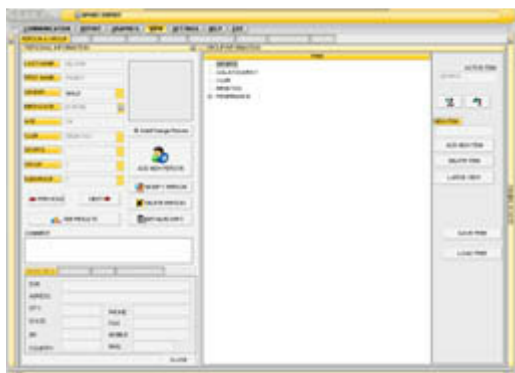
c. Only Tabs

10.1.8. USING COMPONENTS

Most of the frames on the software has a button to be rolled.
As it can be seen on the example above, there is a roll button to make frames smaller.

Frame caption

Click this button to close the frames

Rolled frame sample

Click this roll button to make frames smaller.

Open frame sample
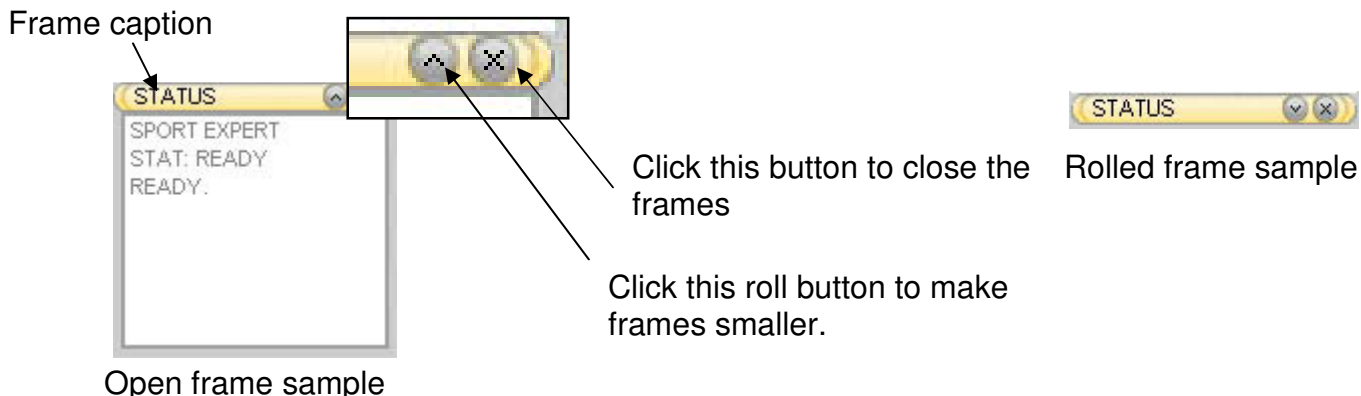
10.2. PERSON AND GROUP DEFINITIONS

This section is used to add/delete/modify people and group. Current operation can be seen inside the "STATUS" frame.

10.2.1. ADDING CLUB DEFINITION

To add a new person, a club definition must exist because each sportsman must be member of a club.
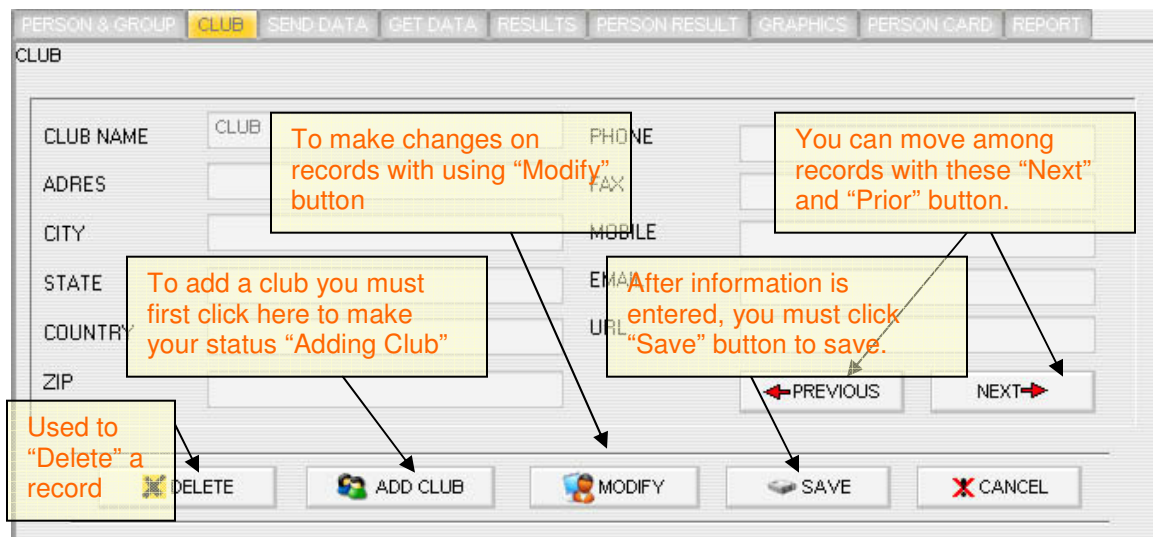
In the CLUB section, a new club might be defined by clicking "ADD CLUB" button. After the information for the new club definition entered into the text boxes, "SAVE" button is used to save the new club definition. In order to modify an existing information for a club "MODIFY" button might be used. In order to save new entries or modifications "SAVE" button is used. "DELETE" button is used to delete an existing information. "CANCEL" button is used to ignore the current operation and to change your status to "READY".

10.2.2.   ADDING SPORTS, GROUP, SUBGROUP

Tree shows the defined groups.

Active item is also available here.

Active item has a different color.

These two buttons "Collapses" and "Expands "the tree.

"New item" is written to this text box.

When "Add new item" button is clicked item in the "New item" text box is added to the tree as a sub member of the "Active item"

Deletes the item in the tree if there is no person who is member of that class.
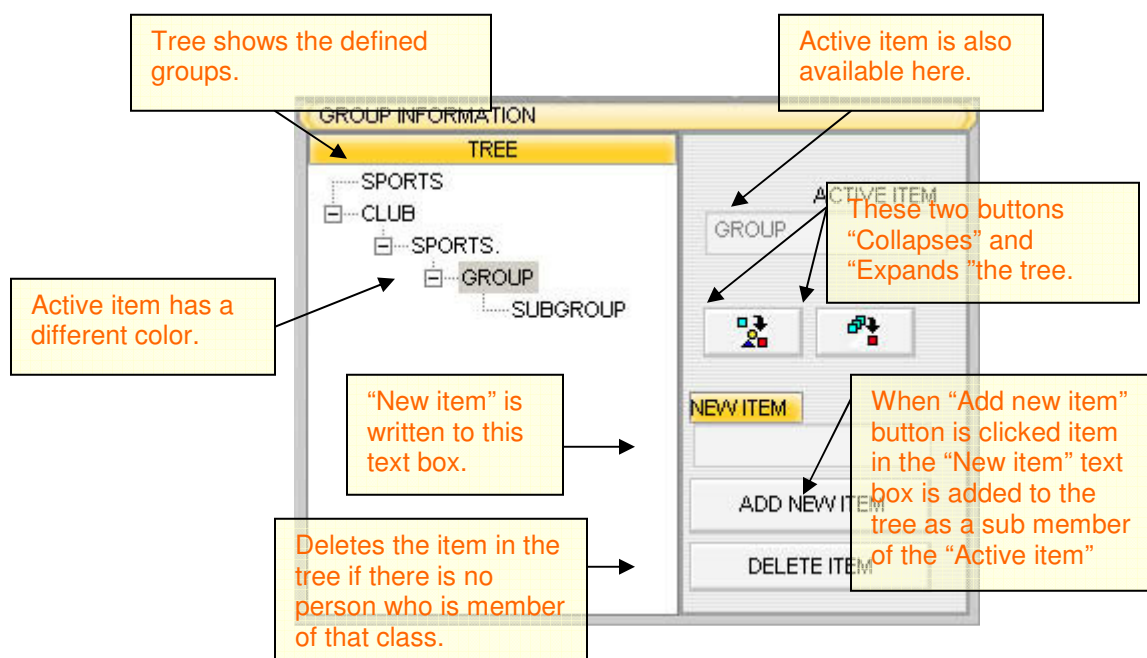
The group information can be seen on the GROUP INFORMATION frame and the tree on the right. New items for a club like sports, group and subgroup can be added here. "ADD NEW ITEM" button is used to add a new item into the tree and "DELETE ITEM" button is used to delete an item from the tree. "COLLAPSE" and "EXPAND" buttons might be used to collapse or expand the tree.

10.2.3. ADDING A NEW PERSON
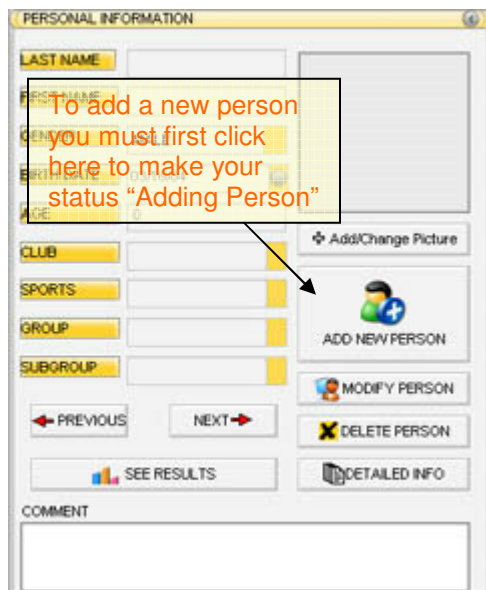
In the PERSON&GROUP section, to add a new person "ADD NEW PERSON" button is used. (When this button is clicked, its label is changed to "SAVE".)
"PREVIOUS" and "NEXT" buttons are used to move inside the person list.

To add a new person you must first click here to make your status "Adding Person"

New person's information is entered to these text boxes.

Age is set automatically.

All available club/sports/group choices will be seen under these combo boxes.

Comment part is used to enter any data that user want to enter about new person.

To picture of the new person "Add/Change Picture" is clicked and an open picture dialog will be opened.

After all information entered the person will be saved by clicking "Save" button.

"Cancel" button is used to ignore all data entered and make status "Ready".

To enter detailed information, "Detailed Info" button shows more choices to enter data.

The entries for the new sportsman are written to the text boxes and combo boxes. To add or change a picture for the sportsman, "ADD/CHANGE PICTURE" button might be used. When it is clicked, an open picture dialog will appear. "COMMENT" combo box might be used to add any comment for the sportsman. "SAVE" button is used to save the entered information for the sportsman.
In order to add detailed information, "DETAILED INFORMATION" button might be used.

When it is clicked, its prompt is changed to "NO DETAILS" and small frame will appear below. Detailed information like "MORE INFO", "PERSONAL", "COACH" and "ANTHOPOMETRIC" might be added into the checkboxes of the tabs of this frame. "SAVE" button is not necessary to save the detailed information.

Tabs in detailed information:
- Personal tab: There is an injury text area.
- Coach tab: Name and surname of the coach.
- Anthropometric tab: Weight and height is entered and BMI is calculated.

HINT: While a new person is begin added, club/sport/group/subgroup information can be set by clicking an item on the tree which is on the left.

Left tree

While status is "Adding person", to enter group data easily, you can click an item on the left tree.

Click an item (while adding person) to load data to the club/sport/ group/subgroup data.

10.2.4.   MODIFYING AND DELETING AN EXISTING SPORTSMAN

To make any changes on an existing person "Modify Person" button can be used.

To move in person records "Previous" and "Next" buttons

To delete an existing person "Delete Person" button can be used.

To see results of a person, find the person on this frame and click "See Results" button.

To modify an existing sportsman, "MODIFY" button is used. After the modifications are completed, "SAVE" button is used. "DELETE" button is used to delete an existing sportsman. To see the results of an existing sportsman, "SEE RESULTS" button might be used. (And also user can see the results of a person on "Person Result" section.) "PREVIOUS" and "NEXT" buttons are used to move inside the entered data.

10.3. COMMUNICATION

In communication section, software communicates with the MPS 501. The aim of this part is to send sportsman's personal information to the MPS 501 and get back the results of tests that were performed by sportsman.

10.3.1.   CREATING SELECTED LIST:

After the person lists have been created, sportsman information is sent to "Selected List" by double clicking the row or using popup (right mouse) menu item "ADD TO SELECTED". Also all rows are added to the selected list by "ADD ALL" popup menu item.

By double clicking the row or using pop up menu, you can add the row to the "Selected List".

To add all data on the "Person List", you can use "**Add All**" menu on the pop up menu.

When row on the person list is double clicked, row will be added to the "selected list".

Selected list.

Send Data Menu

Person list.

To clear all "Selected List", you can use "Clear List " button

To delete only one row, use "Delete Row" button.

10.3.2. QUERY

It can be hard to find specific person information to add to the "Selected List". Then "QUERY" option can be used to filter (mask) the person list. On the query part (in "Send Data" window) club, sports, group or subgroup variables can be set to query the person list.

They can be set by:
- Manually writing the text,
- Clicking an item on the left tree.
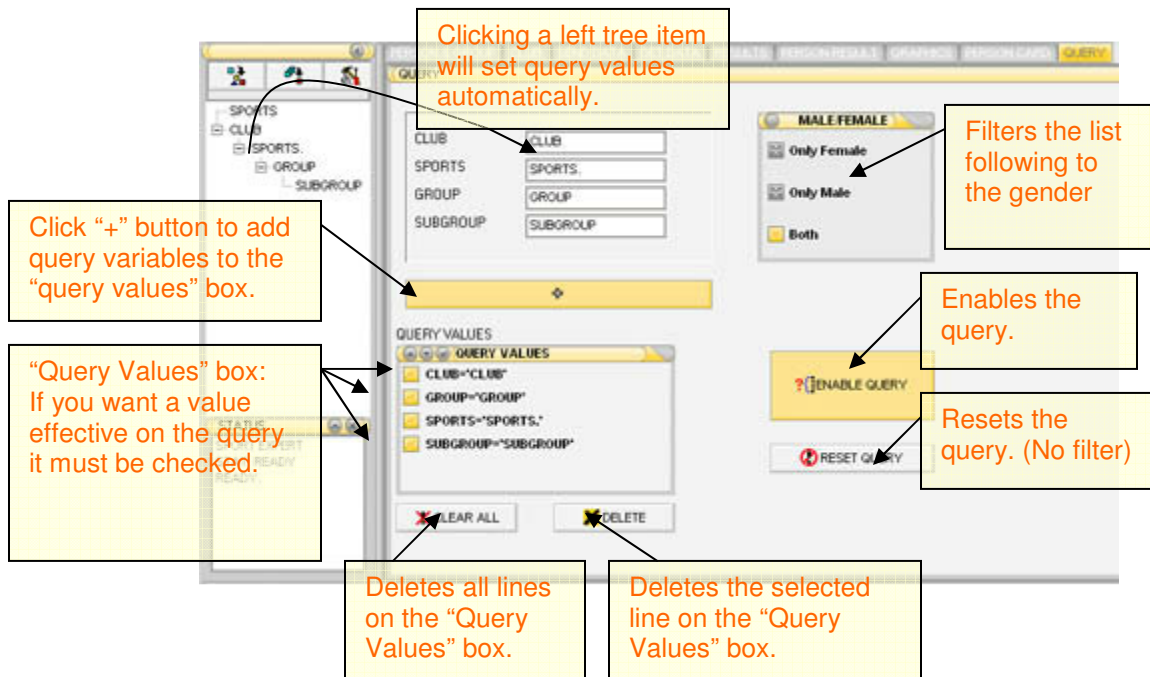
After these values are set, "+" button must be clicked to add variables to the query box.
Another query choice is "MALE/FEMALE" check boxes.
Now if "QUERY" button is clicked then the person list will be filtered. (queried)

HINT: If it is wanted to filter the list with some pre word, "*" character can be used to complete the word.
Example: You want to add all groups beginning with "Team" to the selected list. You have groups defined as Team A, Team B, Team C1.
If you set group definition as 'Team*' then all rows; that have a group field beginning with 'Team'; will be included to the Queried List.
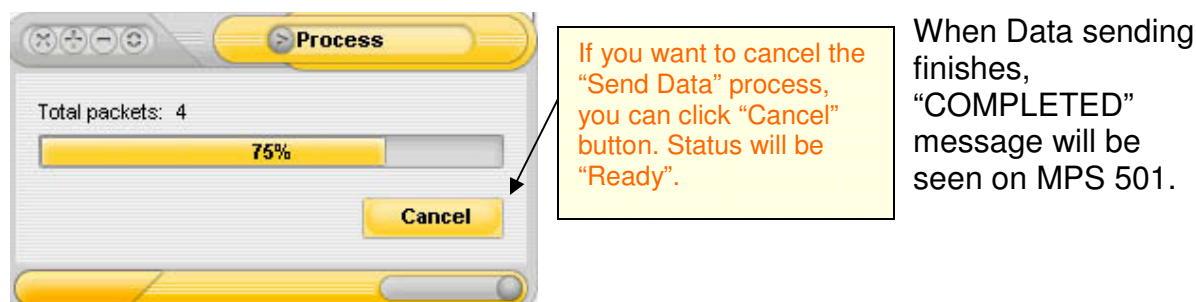
10.3.3. SENDING DATA

To pass this section "SELECTED LIST" must be ready.
By using "SEND SELECTED LIST" button, selected list can be sent to MPS 501.

When selected list is ready by clicking "Send Selected List" button, sending data will begin.
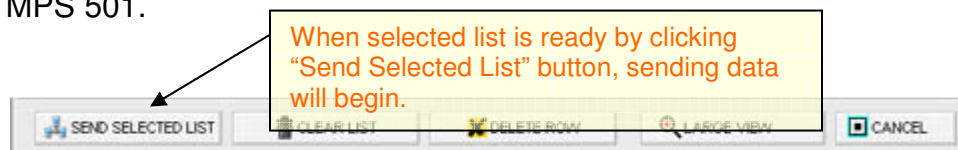
When the button is clicked, a message will warn the user to do above items:

Information

1) Connect cable to the PC,
2) Select "Recieve Data" menu on MPS 501,
3) Press ENTER on MPS 501
4) Press OK button.

OK

HINT:
As you will see on step 3 you will **first** press ENTER button on the MPS 501 because MPS 501 will wait for data.

After you do all items in the to do list, you must click OK button.
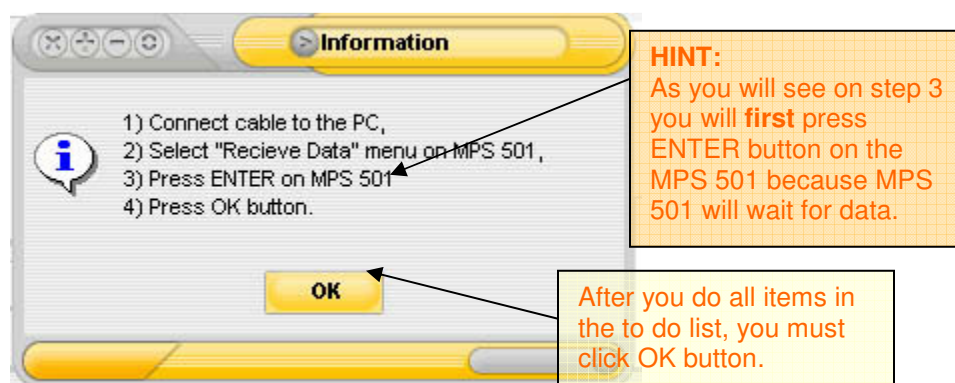
After cable is connected (Serial port connection), Receive Data menu on MPS 501 must be selected and "ENTER" button must be pressed. When "Enter" button on MPS 501 is pressed, the device will wait for data. And when you press OK button on the message window, the window will be closed and sportsman information on the "SELECTED LIST" will be sent to MPS 501. While sending data a progress message window will be seen.

Process

Total packets: 4

75%

Cancel

If you want to cancel the "Send Data" process, you can click "Cancel" button. Status will be "Ready".

When Data sending finishes, "COMPLETED" message will be seen on MPS 501.
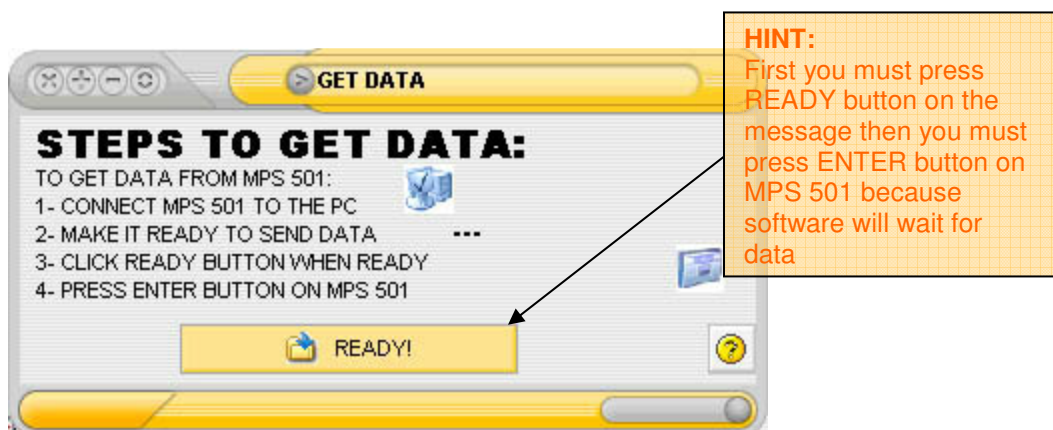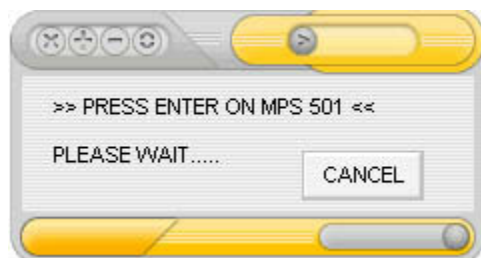
10.3.4. GETTING DATA

After tests are performed to the sportsman with MPS 501 (These sportsman personal datum were loaded to the MPS 501 by "Send Data" section.), results are uploaded to the PC on this section.

You must click "Get Data" button to get data from MPS 501.

On "GET DATA" section by clicking the "GET DATA" button, the user is warned by a message box. The steps are above items:

HINT:
First you must press READY button on the message then you must press ENTER button on MPS 501 because software will wait for data

STEPS TO GET DATA:
TO GET DATA FROM MPS 501:
1- CONNECT MPS 501 TO THE PC
2- MAKE IT READY TO SEND DATA ...
3- CLICK READY BUTTON WHEN READY
4- PRESS ENTER BUTTON ON MPS 501

READY!

After cable is connected (Serial port connection), "Send Data" menu must be selected on MPS 501. Then "READY" button on the message box must be clicked. After these steps software will be waiting for data that MPS 501 will send. Another message window with "Please wait" message will be seen on the screen.

>> PRESS ENTER ON MPS 501 <<

PLEASE WAIT..... CANCEL

Before ENTER is pressed on MPS 501

STATUS: RECEIVING DATA.

PLEASE WAIT CANCEL

After ENTER is pressed on MPS 501

At that time "ENTER" button on MPS 501 must be pressed. Data will be received by software. Timeout occurs if no data is received.

When process is completed, received person information and results will be written to the "Received data" grid.

10.3.5.   SAVING RESULTS

After "Get Data" operation finishes, results will be written to the "Received data" grid. To save a result, the result must be matched with a person. To match result with a person:

- There must be a selected row on the "Received data" grid.
- Then a person on the "List" must be selected to match with a person.
- By double clicking on the "Received data" data grid, person and a result can be matched.

After Get Data operation finished.

- A message box warns the user to proceed the match operation.

The person that result will be matched with.

Data received from MPS 501.

If OK button is clicked then results will be saved for the person. Cancel ignores the operation.
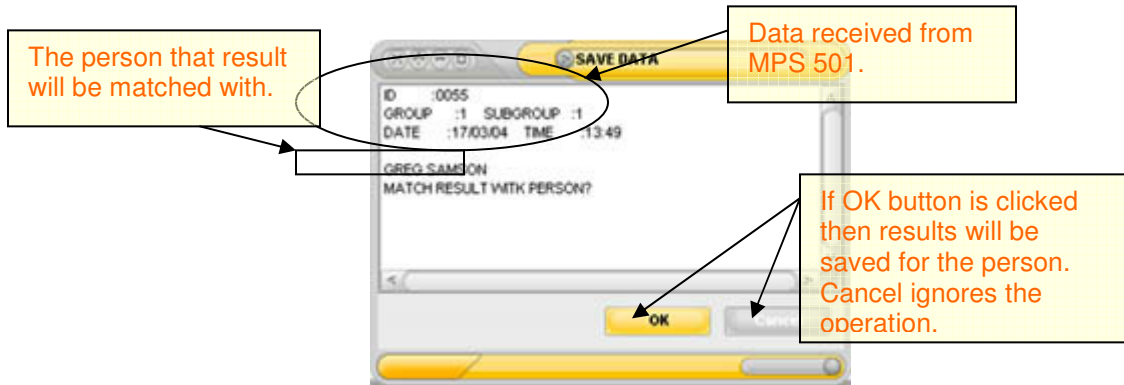
- If operation is proceeded by the user then result will be saved.
- This saved result can be seen on "RESULTS" section.

10.4. RESULTS AND GRAPHICS

10.4.1.   ALL RESULTS

All results that were saved can be seen on the "RESULTS" section. On this section there are two combo boxes that filters results. To see only one function's or a mode's results, these combo boxes can be used.

To filter results, you can use combo boxes. I.e.: Only Chronometer results and all modes.

Saved results

You can delete a saved result with "Delete" button.
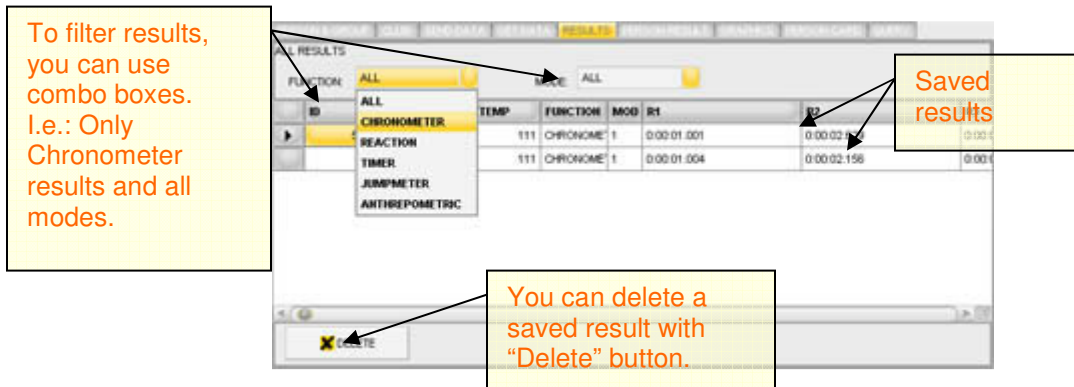
10.4.2.   PERSONAL RESULTS

"PREVIOUS" and "NEXT" buttons are used to move inside the person result data. When a person is selected, his/her NAME, SURNAME and ID will be shown in the text boxes. If "SHOW RESULTS" button is clicked, then the collected data of the sportsman will appear in the grid. The information in the grid includes: DATE, TIME, TEMPERATURE, FUNCTION, MOD and the test results. If "SHOW GRAPH" button is clicked, then GRAPHICS tab is toggled.

10.4.3. GRAPHICS

If "PLOT" button is clicked then the collected data of the sportsman is plotted. If user wants to see only one graph, then she/he must use the "Select Line" combo box.

To see only one graph you must select it from the combo box.

To plot graphs of a person's result.

HINT:
To change person you must go to the "Person Results" section.
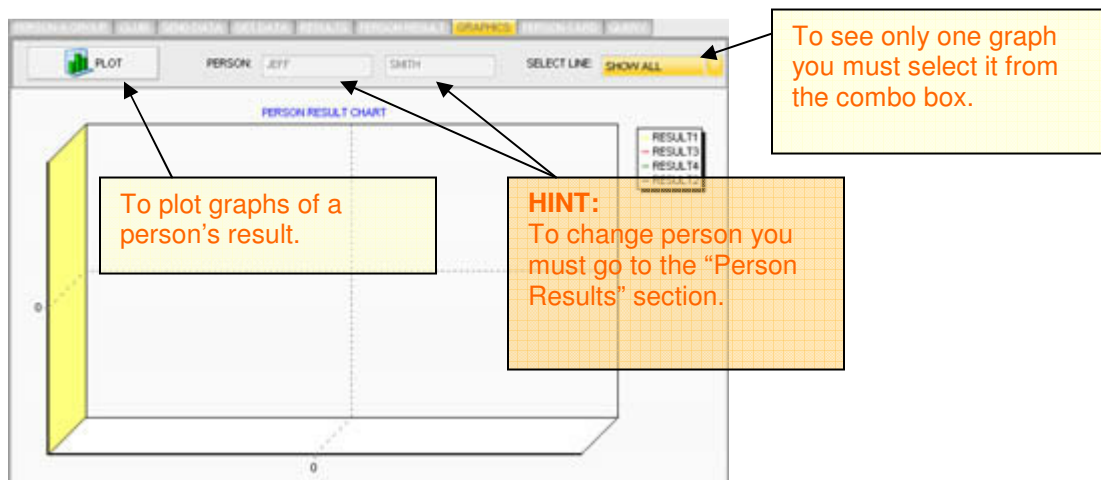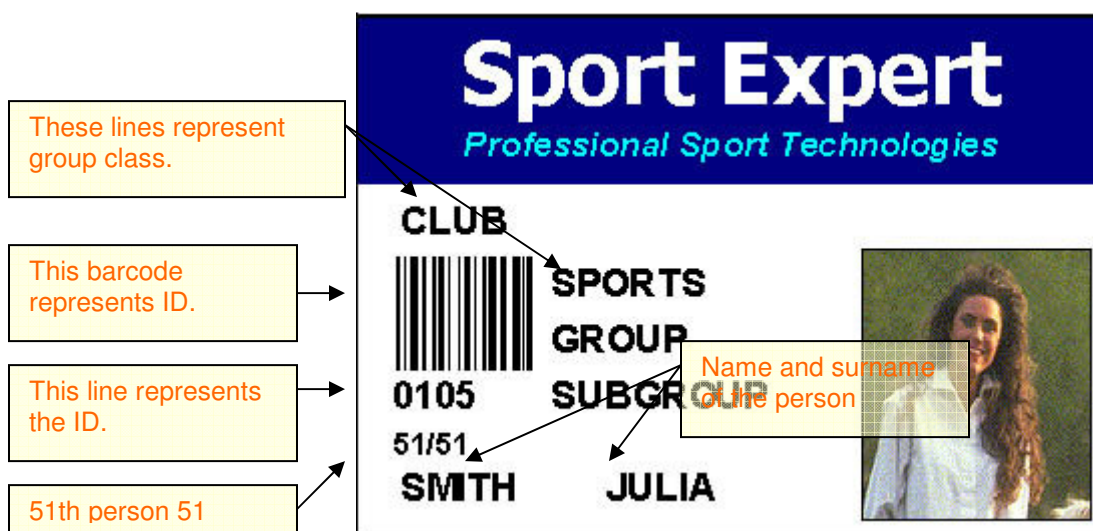
10.5. PRINTING PERSON CARDS

One of the best features of MPS 501 is its ability to use barcodes to define a sportsman. This feature is designed to help users while performing tests.

Person Card

Barcode Card

Options for Person Card: I.e. Print real ideas or start from 1.

This option selects if name or surname will be first.

Preview "Person Card"

Preview "Barcode card"

"PERSON CARD" section can be used to create ID cards for sportsman.
With different choices cards can be printed.
There are two card types to be printed.

10.5.1. PERSON CARD:

It can be used as an ID card with picture to know sportsman on tests. On "Person Card" there is a barcode. After sportsmen are lined up to perform tests, operator can read this barcode with "barcode reader" connected to the MPS 501. MPS 501 will understand who is next to perform the test and automatically will save results for that person.

These lines represent group class.

This barcode represents ID.

This line represents the ID.

51th person 51

10.5.2. BARCODE CARD

"Barcode Card" is used with the same aim of Person Card. The difference is its being smaller and not having picture of sportsman.

Sport Expert
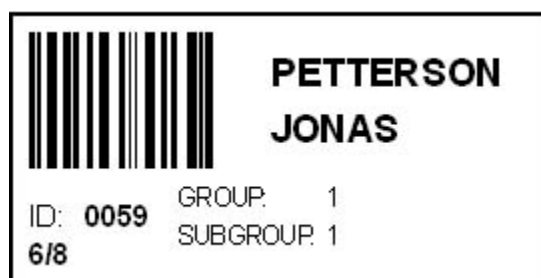
10.6. BACKUP

Backup part is very **important** to be ready for unexpected conditions. In Diagnostic form there is a section to take backup of DB files. To get Backup of DB files "Start Backup" button can be used. It copies all files to the Backup Directory path shown on the window. To change this path "Change Backup Path" can be used.
Initially software defines backup path like:
"The folder which consists the software+Today+1"

i.e: C:\Program Files\SportExpert\Backup\xx_xx_xx_1

On the unexpected condition (like virus, crash etc.), user can copy these files; which are in the backup folder; to the DB folder.
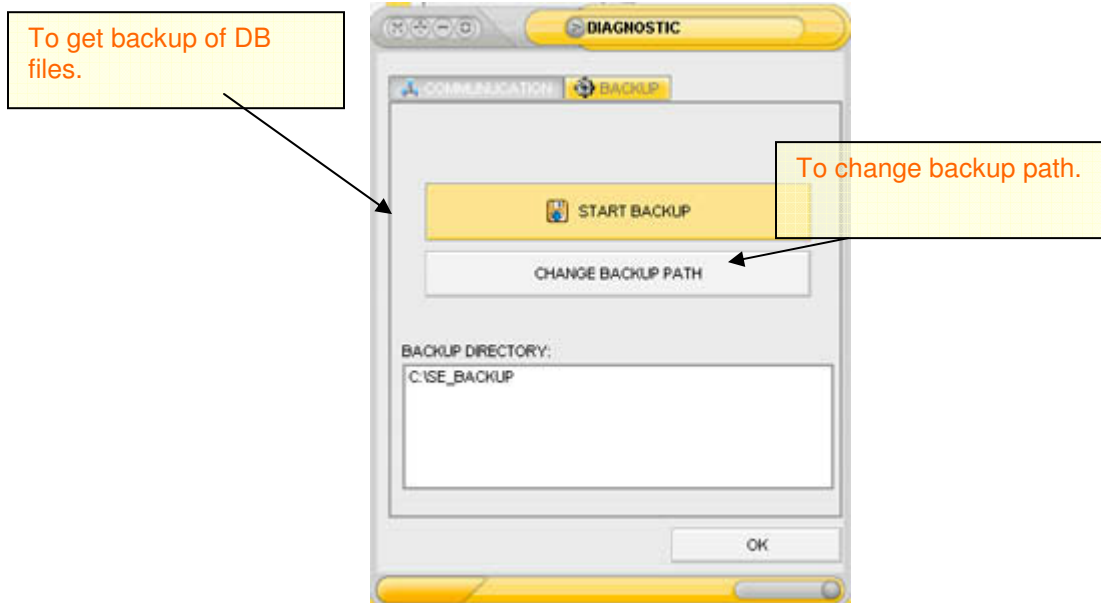
WARNING: User must get backup of DB files periodically for unexpected conditions. The user is responsible from safety of DB files.