

# *REI2*

## Signal lights



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# Signal lights

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## 1 Introduction

REI2 can command both the Microgate  $\mu$ Sem signal lights and, by means of special adaptors, signal lights or other signaling/control devices produced by other constructors.

Main characteristics

The main characteristics of REI2's signal-light control are:

- Independence from the program, see section 1.1 Independence from the program on page 5
- Seven time sequences which can be freely personalized by the user, see section 1.2 Personalization on page 5
- The possibility of freely linking together up to 8 sequences, see section 1.3 Linking sequences on page 5
- Indication of false starts, see section 1.4 False starts on page 6
- Four default sequences assignable to the personalizable sequences (see section 7 Example of configuration on page 17)

### 1.1 Independence from the program

With REI2, signal light management is not confined to a specific program but is available, albeit with specific special features, in all the programs.



In practice, whichever REI2 program is used, the signal light and loudspeaker output control functions are available.

This makes it possible to optimize the number of REI2s used at a specific event.

For example, in a race in which the start and finish are near (cross-country skiing, individual cycling time trials, enduro, ...), it is possible to connect the start signal light directly to the REI2 used for time-keeping (see Fig. 4 on page 17).

### 1.2 Personalization

Signal light management has seven different phases for the management of sequence repetition times, the colors of the signal lights, the tones and the acquisition of false starts, each identified by a descriptive name. The user can intervene on any of these sequences and change them.

### 1.3 Linking sequences

With REI2 up to eight sequences can be linked together. The countdown for each single sequence in the sequence chain is shown on the displayboard.



This special feature makes it possible to manage those situations in which the activation of the signal lights, the displayboard countdowns and the sound signals have different time sequences, for example, different activation sequences for the lights must be repeated every 30, 90 and 600 seconds, but with the countdown linked to the 0 of every sequence.

#### **1.4 False starts**

For each sequence it is possible to set the start validity window. The start time taken by REI2 is analysed to establish whether it falls within (**IN**) or outside (**OUT**) this window. The result of this control and the deviation from theoretical zero time are shown on the printed time-event strip.

## 2 Hardware installation

### 2.1 Connections

The  $\mu$ Sem signals light must be connected to the Digital I/O port on the back of REI2 (see ref. 4 in Fig. 1) using the dedicated cable \$CAB097.

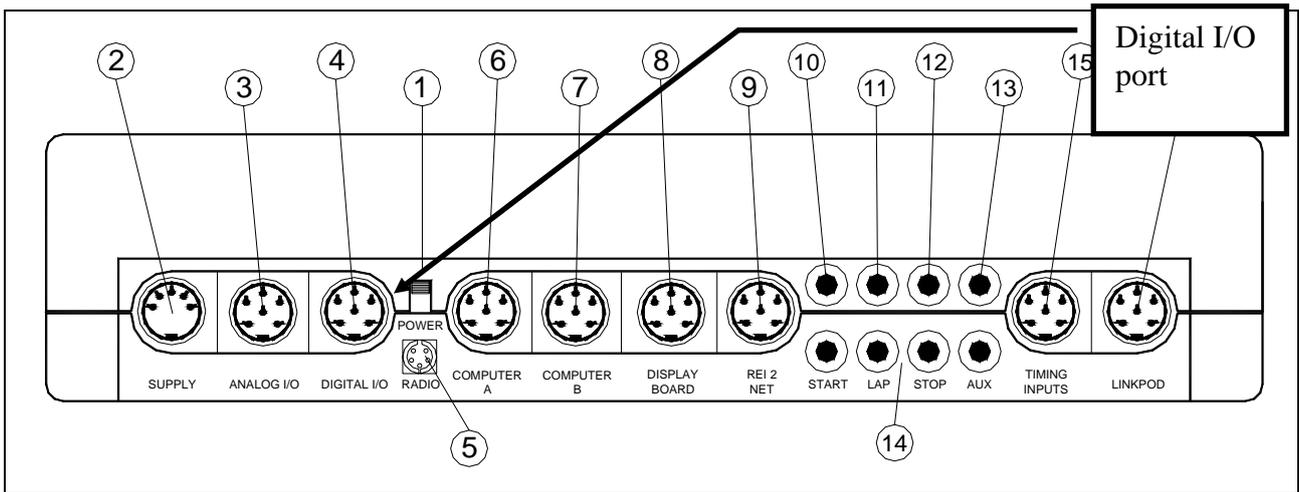


Fig. 1 – Back of REI2 stopwatch (from User Manual)

If an external loudspeaker, or systems of external loudspeakers, is used, it must be connected to the Speaker socket on the left side of REI2 (see ref. 1 in Fig. 2)

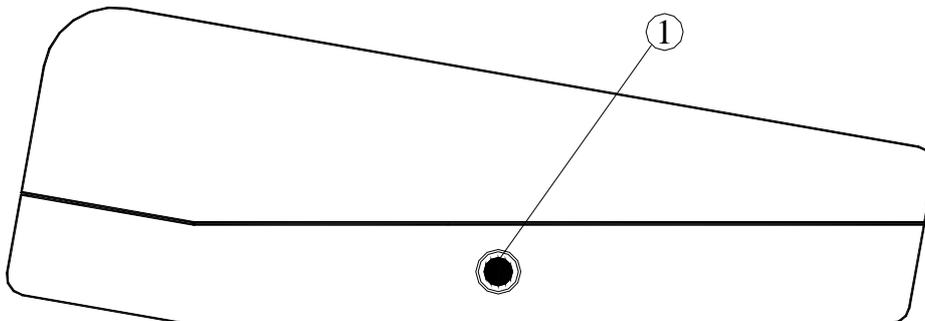


Fig. 2 – Left side of REI2 (from User Manual)



If REI2's Digital I/O output is used to command devices other than the  $\mu$ Sem signal lights, particular attention should be paid to the voltages and currents used<sup>1</sup>.

<sup>1</sup> If devices are connected which work with voltages other than +5 V or which need high currents, use a connection device. Microgate can design and produce customized devices.

## **2.2 Connection to other peripherals**

The connection of other peripherals, start gates, photocells and sensors is not modified by the signal lights.

### 3 Displayboard

The signal light management software uses the  $\mu$ Tab displayboard on address 15 to send information about countdown. This can be disabled.

## 4 Main functions

Within the various time-keeping programs, the behaviour of the combinations of the keys <ALT>+<Light> changes according to whether the sequence is configured with **Manual** or **Automatic** start mode (see section 5.2 Start mode on page 12).

If the sequence is in **Manual** mode, the combination <ALT>+<Light> activates the sequence as specified with the functions described in chap.5 Software setup on page 11.

If the sequence is in **Automatic** mode, it allows you to access the main signal light management functions (time of cycle, active sequence, activation/disactivation).

In the latter case the active functions are:

- **Rep.** 4.1 Repetition
- 10
- **Seq.** 4.2 Sequen 10
- **ON|OFF** 4.3 Activation / disctivation10
- **quit** allows you to quit the function

### 4.1 Repetition

After pressing the key <F1> specify the repetition time for the sequence. Enter the value, confirming with <ENT>, in hours, minutes and seconds. The time thus set is recorded within the sequence which is currently active.

### 4.2 Sequence

Each time the key <F3> is pressed, a new sequence is proposed. The repetition time proposed is changed to the one taken from the new sequence activated.

### 4.3 Activation / disctivation

When the key <F4> is pressed, the sequence is activated **ON** or deactivated **OFF**.

## 5 Software setup

This chapter describes how to personalize countdown management in order to adapt it to your own requirements.



The possibility of changing a sequence directly by pressing <ENT> is active only with Sequence Cycl (see section 5.3 on page 13) set to **No**. Otherwise it can be accessed from the function 5.4.1 Active sequences – sequence cycles

(see page 13).

### 5.1 Sequence modification

There are 7 sequences available. The first 4 (ALP SKI, CRO SKI, RALLY 1, RALLY 2) have the relative default value sequences. The last 3 (PERS. 1, PERS. 2, PERS. 3) do not have default values.

When the key <ENT> is pressed, modification of selected sequence function is activated.

Hh:mm:ss.d						
PROG	S	TIME	LIGHT	SOUND	W	
▶ 1	-	10	ROSSO EX	LONG BOOP	F	Sign in relation to zero
2	-	5	GREEN	BIP	N	Time in relation to zero
3	-	4	GREEN	BIP	N	Signal lights color
4	-	3	GREEN	BIP	N	Sound signal emitted
5	-	2	GREEN	BIP	N	Start signal validity window
-----						
↑	↓	Delete	← default menu →			

The options available are:

- <F1> ↑ scrolls the list of sequence items up. The item selected is indicated by the symbol ▶ next to it
- <F2> ↓ scrolls the list towards choice number 15
- <F3> **Delete** cancels the item indicated by the symbol ▶
- <F4> **Default** copies one of the memorised default sequences into the active sequence. When it is pressed, you are asked to indicate the 'standard' sequence to be used. The various sequences are associated with the function keys from <F1> (alp ski) to <F4> (Rally2). To quit without making any changes press <ESC>
- <F5> **menu** quits the sequence configuration function
- <ALT>+<F3> **Repetit.** Sets the repetition frequency for the sequence. Enter the repetition time in hours, minutes and seconds, confirming each value with <ENT>. If the duration of the sequence is less than the time necessary to carry out all the commands indicated, the value is changed and made equal to the time necessary with the indication **Repetition time changed**
- <ALT>+<F4> **Insert.** Makes it possible to enter a new item before the selected item
- <ENT> **modifies** the values set in the line indicated by the symbol ▶.

To change the commands entered in a line, after selecting it press the key <ENT>. You will be asked for the values to be entered in each column. The value of the column **TIME** must be entered in the format HH:MM:SS (hours, minutes and seconds). The values in the other columns must be

selected by using the key <F3> **Change** which proposes the various possibilities one after the other. To pass from one column to another, press <ENT>.

To insert a new command line, go to a line without a time, press <ENT> and operate in the same way as for a modification.

The following table summarises the various options available.

Column	Value	Description
<b>S</b>	- +	The sign “-” indicates below theoretical zero, the sign “+” above theoretical zero
<b>LIGHT</b>	<b>NOTHING</b>	No operation on the lights of the signal lights
	<b>OFF</b>	The signal lights are ‘switched off’, placing them in the status set with the 5.11 Signal lights off-line mode. See page 15
	<b>RED, YELLOW, GREEN</b>	The corresponding light is switched on; the status of the other lights is not changed.
	<b>PIXEL</b>	A pixel is switched on.
	<b>YELLOW P.</b>	If no pixels are on, the 5 pixels and the yellow light are switched on, if there are pixels already switched on, one of them is switched off.
<b>SOUND</b>	<b>SILENT</b>	No sound signal is emitted
	<b>BIP</b>	A high-pitched tone is emitted.
	<b>BOOP</b>	A low-pitched tone is emitted.
	<b>LONG BIP</b>	A longer high-pitched tone is emitted.
	<b>LONG BOOP</b>	A longer low-pitched tone is emitted.
<b>W</b>	<b>F</b>	The impulse is indicated as being outside the limits <b>Out</b> .
	<b>N</b>	The impulse is indicated as being inside the limits <b>In</b> .



The option <ALT>+<F3> **Repetit.** is active only if the start mode set is **Automatic** (see section 5.2 Start mode on page 12).

## 5.2 Start mode

This allows you to choose whether the sequence must be activated manually by the operator or must start automatically. Each time it is selected one of the two possibilities is activated, that is:

- ‘**Automatic**’: automatically activated sequence at the time specified with the function 5.8 Start time on page 14 and repeated according to the time interval specified with the function 5.1 Sequence modification on page 11 or with the function 5.9 Repetition time on page 14
- ‘**Manual**’: the sequence is activated by pressing the keys <ALT>+<Light>.

### 5.3 Sequence Cycles

This function allows you to choose between the single sequence mode or sequence cycles mode. Each time it is selected, one of these two options is proposed:

- ‘**No**’: for single sequence functioning
- ‘**Yes**’: the sequence cycle set with the function 5.4.1 Active sequences – sequence cycles on page 13 is carried out.

### 5.4 Active sequences

The behaviour of this function depends on whether a single sequence (see chap. 5.4.2 Active sequences – single on page 14) or a cycle of sequences (see section 5.4.1 Active sequences – sequence cycles on page 13) is being used.



The names of the various sequences are only indicative. There is no connection between the discipline timed and the sequence to be used.

#### 5.4.1 Active sequences – sequence cycles

This allows you to link together the different basic sequences created with the function 5.4.2 Active sequences – single (page 14). The sequences used as a cycle of sequences are indicated in the menu next to the function separated by a comma.

The options available are:

- <F1> ↑ scrolls the list of sequences towards the first. The sequence selected is indicated by the symbol ▶ next to it
- <F2> ↓ scrolls the list towards sequence n° 8
- <F3> **Modify** Each time this is selected, one of the sequences available for execution is proposed. The order in which the sequences are proposed is the same as that of the following function
- <F4> **Delete** eliminates the sequence indicated from the cycle
- <ENT> **modify sequence** calls up the function 5.1 Sequence modification on page 11 to change the sequence indicated
- <F5> **Quit** takes you back to the previous menu.



To enter a new sequence go to an unused progressive number ( **Prog** ) and press the key <F3>.

Each time the list of sequences to be executed is changed, a check lasting at least as long as the list of sequences is made. REI2 automatically changes the duration of the sequence list, indicating the new time with the message **Repetition time changed**. The check may take a few seconds.

#### 5.4.2 Active sequences – single sequence

This makes it possible to select the sequence to be used. Each time it is selected, one of the personalizable sequences is proposed. The abbreviated names of the various sequences are: Alp. ski, Cro ski, Rally 1, Rally 2, Pers. 1, Pers. 2 and Pers. 3.

#### 5.5 Sequence status

This makes it possible to specify whether the sequence must be active or not. Each time it is selected, one of the two possibilities is activated, that is:

- ‘**Active**’: the selected sequence is active
- ‘**Disabled**’: the sequence is not active.



Substantial modifications such as synchronizing the machine, changing the mode and type (and activation time if in Automatic mode) of the active sequence deactivate the sequence.

#### 5.6 False start notification

This activates or deactivates the check for false starts. Each time it is selected, one of the two possibilities is activated, that is:

- ‘**Yes**’: The indication **In** or **Out** is printed on the printed strip depending on whether the START impulse acquired is inside the limits established for a valid start or not. Deviation in relation to zero is printed on the printed strip and shown on the displayboard
- ‘**No**’: The start time is not checked.

#### 5.7 Generate automatic start

This makes it possible to generate a START signal at zero time of each countdown.. Each time it is selected, one of the two possibilities is activated, that is:

- ‘**Yes**’: generates a START signal
- ‘**No**’: does not generate any signal.

#### 5.8 Start time

This function is for entering the start time and date of the automatic sequence. The data must be entered in the format hours, minutes, seconds, day, month and year, each value being confirmed with <ENT>.



This function can be called up only if the start mode is **Automatic**.

#### 5.9 Repetition time

This function is used to set the frequency with which the selected sequence must be repeated.



The value set must be greater than the duration of the sequence (or cycle of sequences) selected. Otherwise REI2 sets the repetition time to the minimum value possible. This is communicated with the message **Repetition time changed** followed by the time set.



This function can be called up only if the start mode is **Automatic**.

### **5.10 Displayboard countdown**

With this function transmission of countdown information to the  $\mu$ Tab displayboard on address 15 is activated and deactivated.

- **Disabled** data are not sent to the displayboard
- **Active** the data for the countdown are transmitted and also, if the acquisition of false times is enabled (chap. 5.6 False start notification on page 14), the deviation in + or – in relation to zero of the acquired start.

### **5.11 Signal lights off-line mode**

This function sets the appearance of the signal lights when switched off. Each time it is selected, one of the three possibilities is activated, that is:

- **‘Off’**: all the lights are switched off
- **‘Red’**: only the red light stays on
- **‘Red int.’**: the red light, flashing, stays on.

### **5.12 Displayboard type**

This function is used to choose whether always to display the countdown on a  $\mu$ Tab or  $\mu$ Graph displayboard on address 15.

If it is used for single/group starts, it is possible to display the name of the next competitor to start. If the  $\mu$ Tab displayboard is used, the slave displayboard must be used.

### 6 Printed strip

If the acquisition of false starts is enabled, deviation in relation to 0 and the indication as to whether the time is inside the validity window or not are printed on the printed strip.

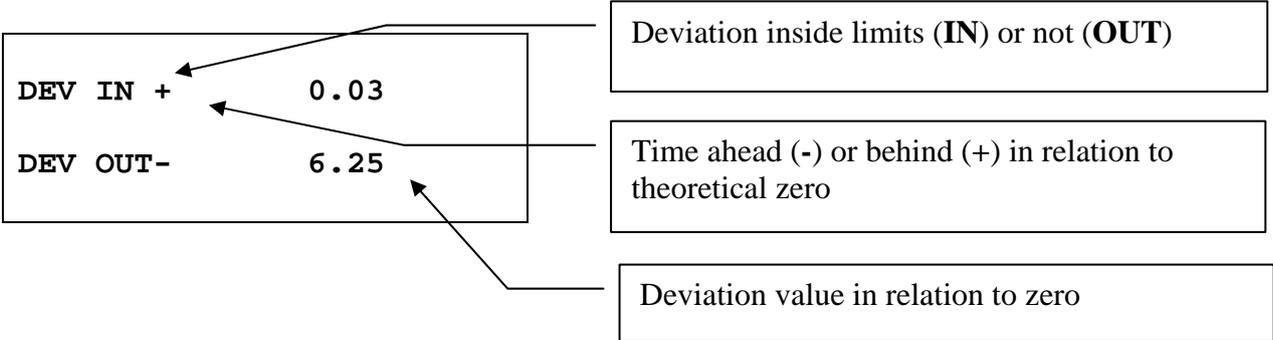


Fig. 3 – Example of printed strip: Acquisition of deviations.

## 7 Example of configuration

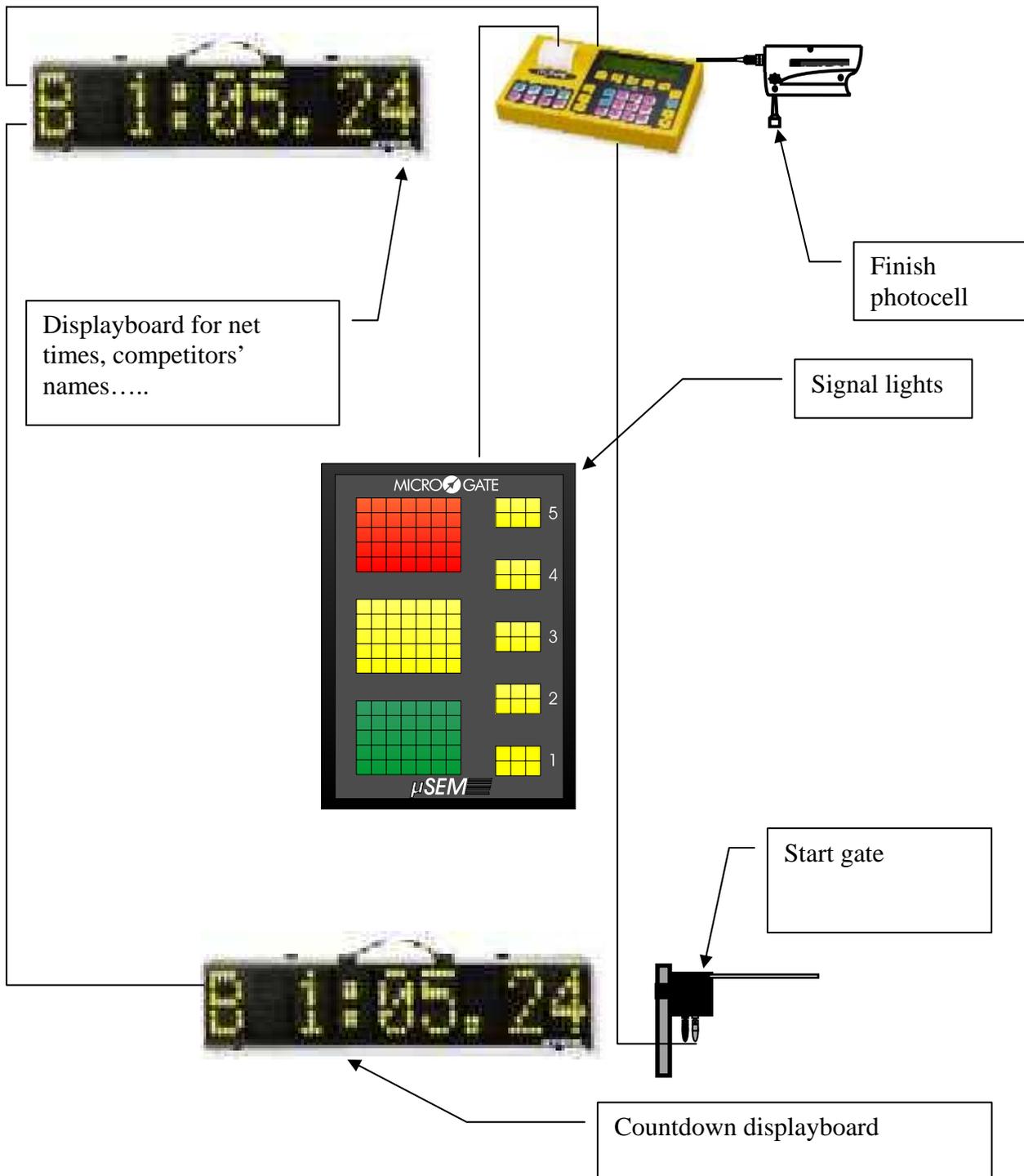


Fig. 4 – A REI2 for individual cross-country skiing.

## 8 Pre-set configurations

Below the settings for memorised default configurations are indicated.

### 8.1 Alpine skiing

Progressive	Sign	Time	Lights	Tone	Window
1	-	10	Red	Long Boop	F
2	-	5	Green	Bip	N
3	-	4	Green	Bip	N
4	-	3	Green	Bip	N
5	-	2	Green	Bip	N
6	-	1	Green	Bip	N
7	+	0	Green	Long Bip	N
8	+	5	Red	Silent	F
9	+	10	Off	Silent	F

### 8.2 Cross-country skiing

Progressive	Sign	Time	Lights	Tone	Window
1	-	10	Red	Long Boop	F
2	-	5	Red	Bip	F
3	-	4	Red	Bip	F
4	-	3	Green	Bip	N
5	-	2	Green	Bip	N
6	-	1	Green	Bip	N
7	+	0	Green	Long Bip	N
8	+	3	Red	Silent	F
*	+	10	Off	Silent	F

### 8.3 Rally 1

Progressive	Sign	Time	Lights	Tone	Window
1	-	10	Red	Long Boop	F
2	-	5	Yellow p.	Bip	F
3	-	4	Pixel	Bip	F
4	-	3	Pixel	Bip	F
5	-	2	Pixel	Bip	F
6	-	1	Pixel	Bip	F
7	+	0	Green	Long Bip	N
8	+	20	Off	Silent	F

#### 8.4 Rally 2

Progressive	Sign	Time	Lights	Tone	Window
1	-	10	Red	Long Boop	F
2	-	5	Yellow	Bip	F
3	-	4	Yellow	Bip	F
4	-	3	Yellow	Bip	F
5	-	2	Yellow	Bip	F
6	-	1	Yellow	Bip	F
7	+	0	Green	Long Bip	N
8	+	30	Off	Silent	F

## 9 Signal lights menu

(M x)

M x/y: Signal lights

M x/y.A: Start mode

5.2 Start mode 12

M x/y.B: Sequence Cycles

5.3 Sequence Cycl 13

M x/y.C: Active sequences

5.4 Active sequences 13

M x/y.D: Sequence status

5.5 Sequence status 14

(other)

M x/yb A: False start notification

5.6 False start notification 14

M x/yb.B: Generate auto start

5.7 Generate automatic start 14

M x/yb.C: Start time

5.8 Start time 14

M x/yb D: Repetition time

5.9 Repetition time 14

(other)

M x/yc.A: Displayb. countdown (addr.15)

5.10 Displayb 15

M x/yc.B: Signal lights off-line mode

5.11 Signal lights off-line mode 15

M x/yc C: Diplayboard type

5.12 Diplayboard type 15

## 10 Editing history

The following table summarises the main changes made to this document.

<b>Program version</b>	<b>Chapter</b>	<b>Page</b>	<b>Description of editing</b>
1.04			First version of this manual
1.07.9			General edit for version 1.07.9
1.08.2	8.3	18	Modified sequence Rally 1
1.08.5			No substantial modification

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The software and manuals are available in the following languages: Italian, English, German and French.

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