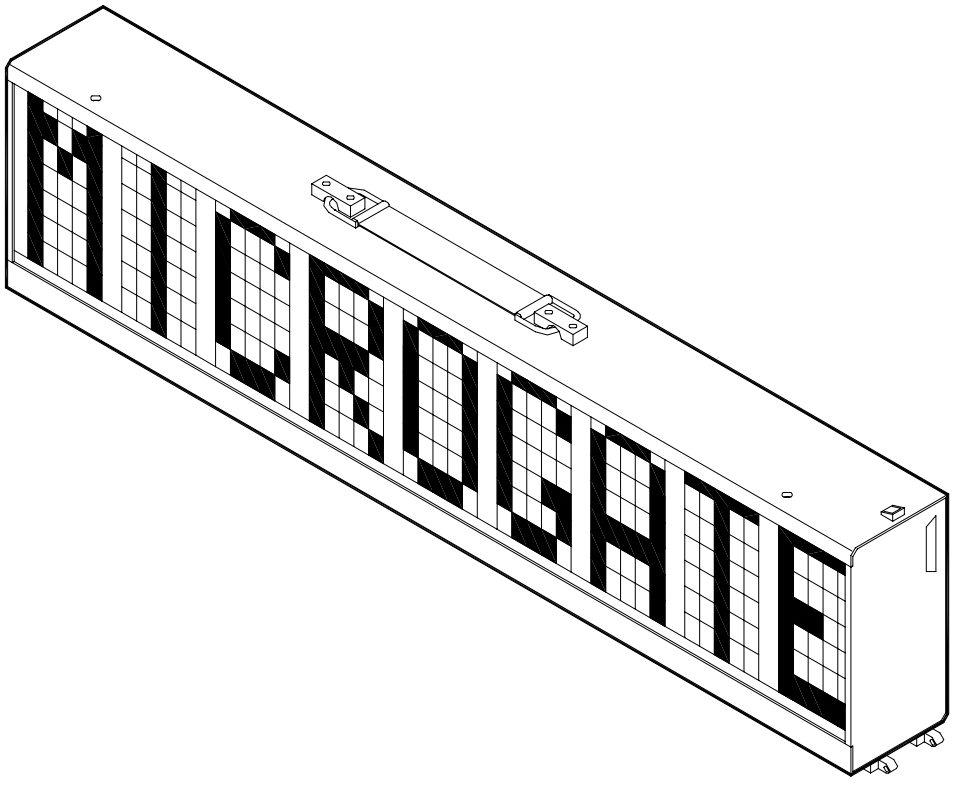
# ALPHANUMERIC DISPLAYBOARD

# μTAB

## AND SELF-TIMING SYSTEMS

# User Manual




*Version 2.2*

MICROGATE

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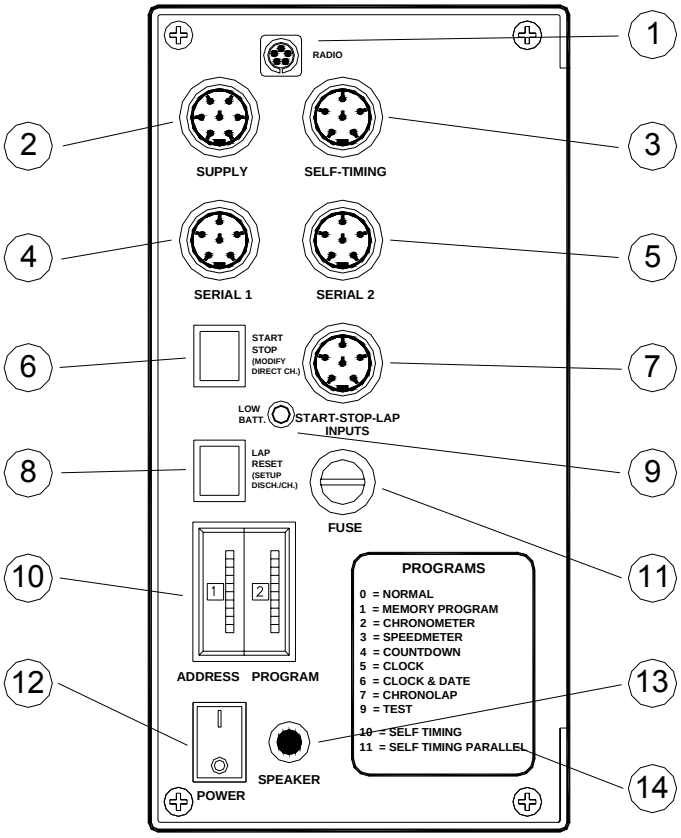
# 1 ALPHANUMERIC DISPLAYBOARD µTAB (MICROTAB)

## 1.1 CONTROL PANEL




1 5 pole Nucletron RADIO connector for connection of *Linkgate* radio system
2 7 pole Amphenol SUPPLY connector for external power supply and battery recharge
3 6 pole Amphenol SELF-TIMING connector for connection of Self Timing systems
4 6 pole Amphenol SERIAL 1 connector for serial input/output
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8 Yellow LAP RESET (SETUP DIRECT CHARGE) button used for:
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- confirmation of program settings
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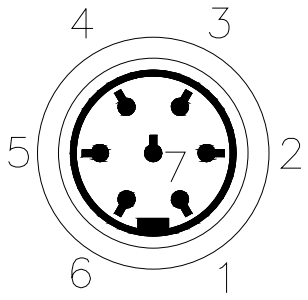
9 LOW BATTERY led to indicate battery status
10 Rotating ADDRESS switches for addressing lines and PROGRAM for program selection
11 FUSE for power supply
12 On/off displayboard POWER switch
13 External loudspeaker connection jack
14 Hardware programs legend

## 1.2 CONNECTIONS

- ***SUPPLY (7 pole Amphenol)***

1 Ground
2 Ground
3 Ground
4 External supply input (8-25V)
5 External supply input (8-25V)
6 External supply input (8-25V)
7 Remote on/off input



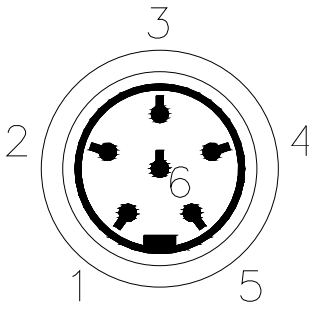

7 pole Amphenol Connector

- ***SELF-TIMING (6 pole Amphenol)***

1 START signal
2 COIN signal
3 PARALLEL signal
4 REDLINE signal
5 AUX signal
6 GREENLINE signal

- ***SERIAL 1 (6 pole Amphenol)***

1 SERIAL 1 - RS232 TX output
2 SYNC IN
3 SERIAL 1 - RS485 + RX input
4 SERIAL 1 - RS485 – RX input
5 Ground
6 SERIAL 1 - RS232 RX input




6 pole Amphenol Connector

- ***SERIAL 2 (6 poles Amphenol)***

1 SERIAL 2 - RS232 TX output
2 SERIAL 1 - RS232 TX output
3 SERIAL 2 - RS485 + output
4 SERIAL 2 - RS485 - output
5 Ground
6 SYNC OUT

- ***START-STOP-LAP INPUTS (6 pole Amphenol)***

1 Start (NO - Normally Open)
2 +5V fixed, max 1A
3 Ground
4 LAP (NO)
5 STOP (NO)
6 Not used

## *1.3 POWER SUPPLY*

Power can be supplied in three ways:

- By connecting the µTAB displayboard to the MICROGATE battery charger. In this way it is possible to supply up to 6 mains supplied µTABs (1 MASTER and 5 SLAVES, see chap.1.4.1.1 µTAB MASTER and µTAB SLAVE on p.10) and to keep the batteries charged at the same time. This guarantees perfect functioning also when the mains power supply is interrupted.
- By using the internal batteries of the displayboard. In this case autonomy is usually above 30 hours of continuous functioning (depending on the type of display used).
- By connecting the displayboard to any continuous current supply (whether steady or not) between 10 and 30 Volts which is able to supply at least 30W peak power and about 2W average power. A car battery guarantees several days' autonomy.

**Important note:** the adaptor *ACC062* for the µTAB displayboard **is not suitable for outdoor use**. Consequently Microgate does not accept any responsibility for damage to persons or things due to incorrect use of the adaptor.

### 1.3.1 Battery Recharge

If the batteries are low, either the *discharge/recharge* or the *immediate recharge* procedure can be carried out.
In the first case, the batteries are first discharged and only subsequently recharged. This allows the batteries to maintain their original capacity over a long period.
To select **discharge/recharge, keep the "START STOP (MODIFY CHARGE/DISCHARGE)" button on the control panel pressed down for at least 2 seconds with the displayboard switched off** after connecting an external power source to the connector SUPPLY**.** The operation will take from a minimum 7 hours to a maximum of about 10 hours, depending on the initial battery charge level.
If you choose immediate recharge instead, the operation will last about 7 hours. However, although this type of recharge takes less time, it should only be used in exceptional circumstances as it shortens the life of the batteries.
To select **immediate recharge**, **keep the yellow "LAP RESET (SETUP DIRECT CHARGE)" button on the control panel pressed down for at least 2 seconds with the displayboard switched off** after connecting an external power source to the connector SUPPLY**.**
In both recharge modes it is possible **to interrupt the process** by pressing the START STOP and LAP RESET keys simultaneously.

The LOW BATTERY led on the control panel tells you the battery charge status, the type of power source used and the recharge operation status when the battery is being recharged.

| **EXTERNAL SUPPLY** | |
|---|---|
| STATUS | LED LOW BATTERY |
| • Displayboard *On or Off*<br>• Batteries *Charged* | Green – Green – Pause |
| • Displayboard *On or Off*<br>• Batteries *Discharged* | Green – Red – Pause |

| **INTERNAL SUPPLY (BATTERY)** | |
|---|---|
| STATUS | LED LOW BATTERY |
| • Displayboard *Off*<br>• Batteries *Charged or Discharged* | Off |
| • Displayboard *On*<br>• Batteries *Charged* | Green – Pause – Green – Pause |
| • Displayboard *On*<br>• Batteries *Discharged* | Red – Pause – Red – Pause |

| **CHARGE/DISCHARGE** | |
|---|---|
| STATUS | LED LOW BATTERY |
| • Start of Discharging | Pause – Red – Pause – Red FAST |
| • Discharging Over–Start of Recharging | Pause – Green – Pause – Green FAST |
| • Recharging Over | Green |
| **DIRECT CHARGE** | |
| STATUS | LED LOW BATTERY |
| • Start of Recharging | Pause – Green – Pause – Green FAST |
| • Recharging Over | Green |

# *1.4 MODULAR SYSTEM*

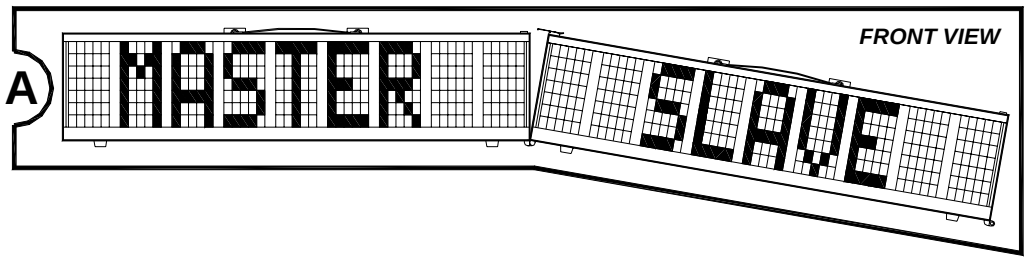
## 1.4.1 µTAB Master and Slave

There are two types of alphanumeric µTAB displayboard:

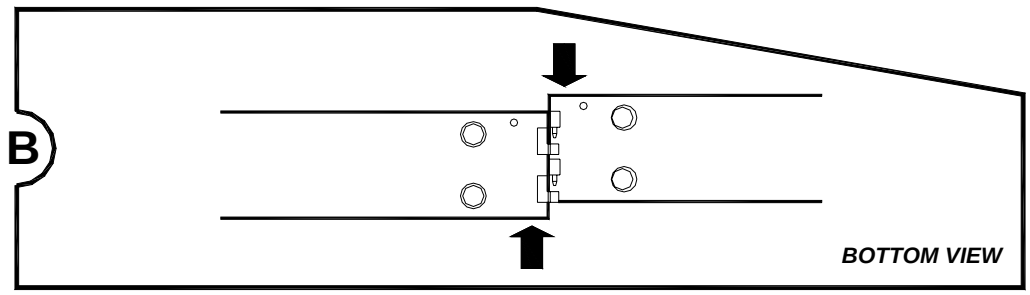
- MASTER – the "intelligent" displayboard, fitted with a control panel in its side and internal electronics, is used individually or in systems in which 2 or more displayboards are used.
- SLAVE – the "auxiliary" displayboard, without a control panel in its side, **cannot be used individually**, and is used in systems featuring lines composed of two or more displayboards. For example, a line of 45 characters (5 displayboards) is created with 1 MASTER displayboard (the first on the left) and 4 SLAVE displayboards.

### *1.4.1.1 µTAB MASTER and µTAB SLAVE Connection*

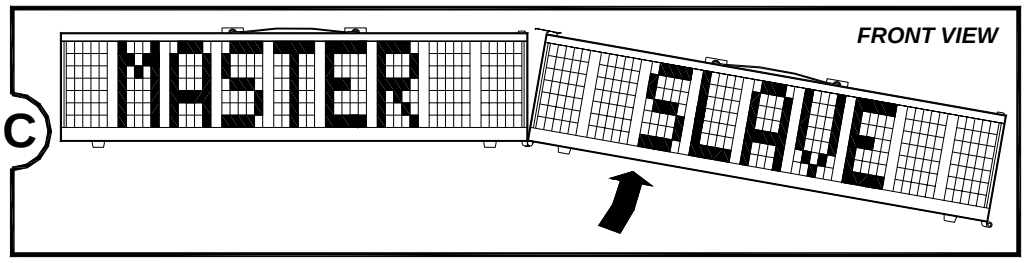
µTAB allows you to connect up to 6 displayboards (1 MASTER and 5 SLAVES), with the possibility of displaying lines composed of a maximum 54 characters without any break between one µTAB and the next. The MASTER displayboard "controls" the SLAVES through the connector DB25 situated on the control panel on the right (front view).
µTAB MASTER can be joined to µTAB SLAVE as explained below:



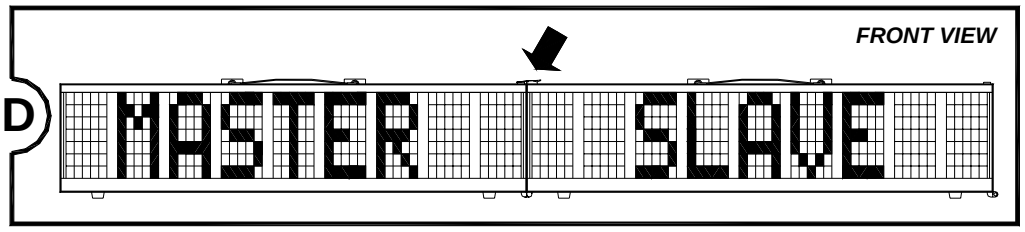

A. Bring together the displayboards, keeping the µTAB SLAVE slightly tilted so that the pins at the base of the displayboards are ready to be fitted into place.




B. Align the µTABs sideways so that the pins on the SLAVE displayboard enter the slots provided for them on the MASTER.




C. Align the µTABs horizontally, making sure that the male connector DB25 on the panel on the right (front view) of the MASTER displayboard is properly inserted in the DB25 on the panel on the left (front view) of the SLAVE displayboard.




D. Close the zip situated on the top left (front view) of the SLAVE displayboard.

In systems in which 3 or more µTABs are used, the same steps should be followed when joining up displayboards 3,4, etc.

### *1.4.1.2 Display of 2 or more lines*

It is often necessary to use 2 or more µTABs to display 2 or more lines. This option is possible by using only MASTERS (which allow 9 characters per line to be displayed) or by using lines composed of MASTERS and SLAVES (up to a maximum 6 displayboards per line, therefore 54 characters). As can be seen in Figure 1, the MASTER of the first line must be connected through SERIAL 1 to the control device (using cable CAB011 if the control device is *REI2*, a 20m CAB010 cable and a 2m CAB001 cable if it is a PC), the SERIAL 1 of the second MASTER to the SERIAL 2 of the first (with cable CAB009) and so on for each subsequent line. In addition, the number of each line must be set with the rotating ADDRESS selector situated on the MASTER control panel. The Address of the first line will be 0, of the second line 1, etc.

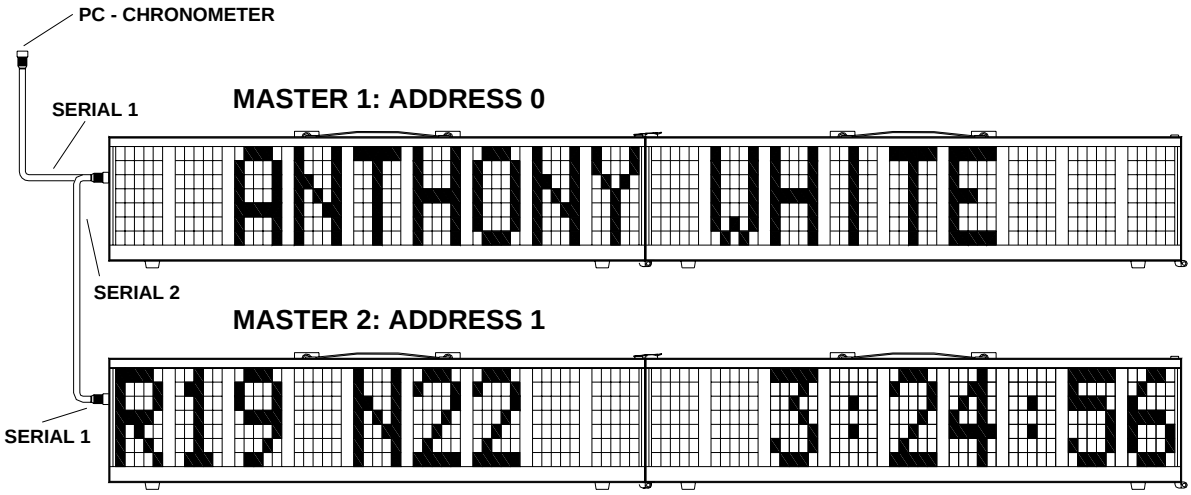



**Figure 1**

In the example shown in Figure 1, 2 µTAB MASTERS e 2 SLAVES have been used to display the name of the competitor, his position at the finish, his race number and his race time

### *1.4.1.3 Use of µTAB MASTER as µTAB SLAVE*

µTAB makes it possible to connect two or more MASTER displayboards, using the first as MASTER and the others as auxiliaries (or SLAVES) so that lines of more than 9 characters can be displayed.

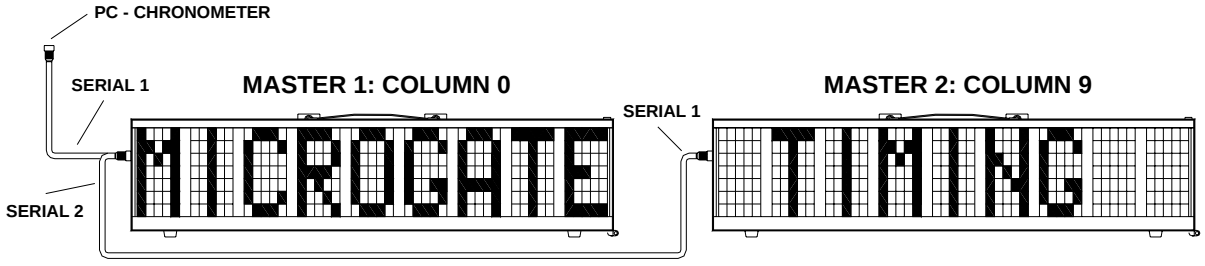



**Figure 2**

As can be noted in Figure 2, the connector SERIAL 2 of the first MASTER is connected to the SERIAL 1 of the one after. If 3 displayboards had been used, the SERIAL 2 of the second would have had to be connected to the input SERIAL 1 of the third, and so on for each subsequent displayboard. Finally, the SERIAL 1 of the first MASTER must be connected to a control device.
It is also necessary to set the "Column" value of the displayboards to indicate the position of the first character of each displayboard in relation to the string to be displayed: the first displayboard must be set with Column value at 0 (default value, see par. 2.1 Program 0 (Normal) on p.16), the second with Column 9, the third with 18, etc.
However, the use of MASTER displayboards with SLAVES has a drawback: unlike a µTAB SLAVE, a MASTER cannot be directly connected to the previous MASTER, thus making it impossible to display strings without spaces between one displayboard and the next.

## 1.5 VIA RADIO SYSTEM

Some programs for the µTAB displayboard (see par. 2 Program on p.15) make it possible to use the *Linkgate* radio system connected through *Decoder* or *DecRadio* to the RADIO connector situated on the µTAB control panel. Thanks to *Linkgate* it is possible to transmit START STOP and LAP signals from a long distance and, in Program 0 (Normal), serial data.
For further information about the *Linkgate* system, consult the appropriate REFERENCE MANUAL.
In the following paragraphs, the possibility of using the via radio system will be indicated by a section ***RADIO.***

**NOTE**: To be able to use the *Linkgate* system in Program 2 (Chronometer), Program 3 (Speedmeter) and Program 7 (Lap Chronometer) the radio channel must be set in Program 0 (Normal) (see p.16) of the µTAB.
To be able to transmit control commands in Program 0 (Normal) via radio the velocity of the serial communication must be set to "*RAD.*" within the settings of Program 0 (Normal) (see p.16).

## 1.6 µTAB FIRMWARE

Every time it is switched on, µTAB displays the firmware version stored at that moment:

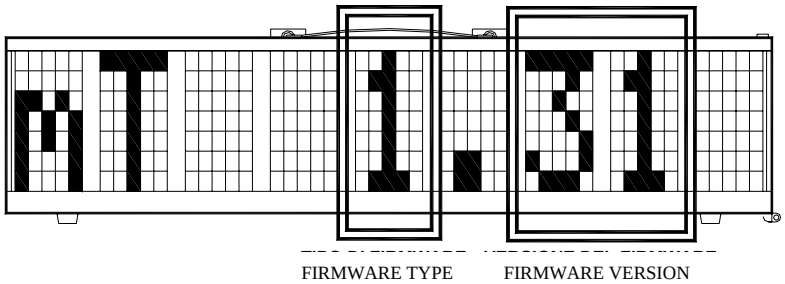



**Figure 3**

As can be noted in Figure 3, the numerical code of the firmware consists of 2 parts:

1. *Type of Firmware*, the first number, varies according to the programs that can be performed with the displayboard acquired:
   - 1 = Standard Firmware
   - 2 = Standard Firmware with Program 10 (Self Timing) enabled
   - 3 = Standard Firmware with Program 10 (Self Timing) and Program 11 (Parallel Self Timing) enabled
   - 4 = Standard Firmware with Program 13 – Omega Powertime Chronometer, Program 14 – ALGE Chronometers and Program 15 – Omega/Longines 5005 Chronometers enabled

2. *Firmware Version*, the last two numbers: it is important to provide the MICROGATE staff with this number if you require technical assistance.

### 1.6.1 Firmware updating

Free µTAB Firmware updating is possible by downloading the latest versions from the site http://www.microgate.itor requesting them from MICROGATE.
Once the update file has been obtained, the operations to be performed are simple:

A. Switch off µTAB and set the rotating selectors PROGRAM and ADDRESS to 15 and 15
B. Press the START STOP (MODIFY) e LAP RESET (SETUP) buttons simultaneously and, while keeping them pressed down, switch on the displayboard (attention, the power supply must be disconnected before switching on the displayboard); the led on the displayboard should slowly blink red-green.
C. Connect the PC serial to the µTAB SERIAL 1 connector (using the 20m CAB010 cable or the 2m CAB001)
D. From the PC run the uFlasher program containing the latest Firmware version. During programming, the LOW BATTERY led on the displayboard turns ORANGE.
E. After about 2 minutes programming is over (uFlasher shows the message "Device successfully programmed"). At this point, the led turns GREEN.
F. The µTAB Firmware has been successfully updated. Now you can switch off the displayboard and change the settings on the rotating selectors PROGRAM and ADDRESS.

Any error in programming is indicated by the LOW BATTERY led on the displayboard, which turns RED. In the unlikely eventuality that this should happen, simply repeat the procedure indicated above.

# 2
# PROGRAMS

## 2.1 PROGRAM 0 (NORMAL)

By selecting the Program 0 (Normal) it is possible to command µTAB through the SERIAL 1 serial communication port or the RADIO connector.
The commands that can be given to µTAB are listed in 3.1.1 µTAB Serial Frame – Self Timing.
Each command consists of an inizialitation character (ESC, ASCII 27), a character which identifies the command, a line identifier (A,B,etc.) which makes it possible to address only the displayboards you are interested in if there is more than one. The identifier 'A' corresponds to Address 0 on µTAB, 'B' to Address 1 and so on. The character " " (ASCII 32 SPACE) refers to all the displayboards without distinction (that is to say, the command is executed on all rows).
Commands end with a terminator (ETX,ASCII 03) and with a control character (checksum on 7 bits of the characters that make up the command, STX and ETX included). This last character is necesssary to decode the command. We strongly recommend the less experienced to exploit the versatility of the program MICROGATE µBOARDS for Personal Computer to control µTAB correctly, rather than making tedious attempts at direct programming.

**NOTE**: The commands identified with the term 'priority' or 'non-priority' (or 'strong' and 'weak') should be understood to mean priority or non-priority with respect to the break command. For example, a '*Weak Reset*' command given after a break command will be executed only at the end of the break. A '*Strong Reset*', on the other hand, will be executed unconditionally.

***RADIO***: When the *Linkgate* system via radio is used in Program 0 (Normal), the type of radio signal used is different from that of the other programs and it is advisable not to exceed a transmitter/receiver distance greater than 150m.

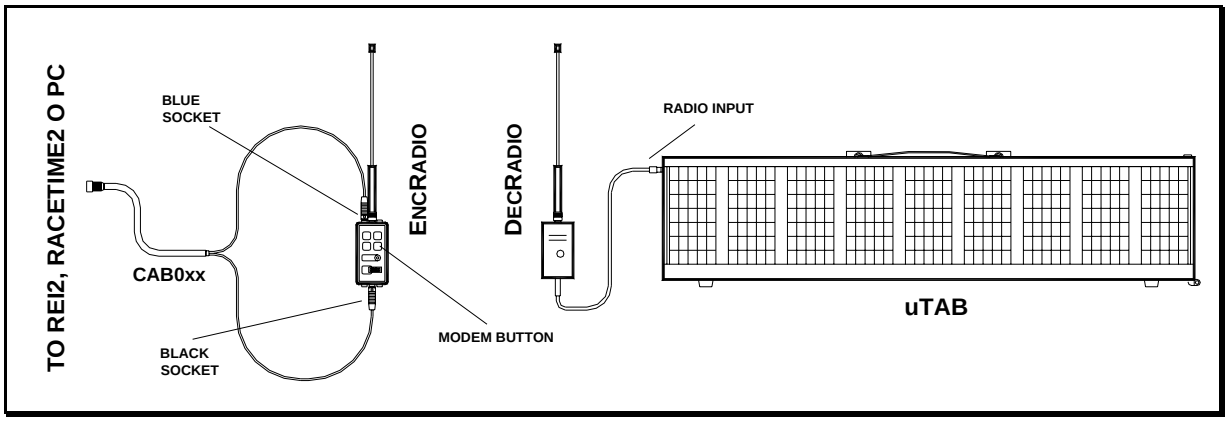


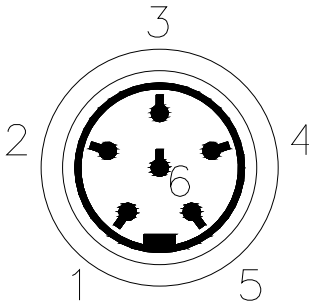

**Figure 4**

As can be seen in Figure 4, the *DecRadio* (or *Decoder*) is connected directly to the RADIO connector on the displayboard, whereas the *EncRadio* (or *Encoder*) is connected to a PC, *REI2* or *RACETIME2* with the appropriate cable (CAB073 for PC, CAB075 for *RACETIME2* and CAB071 with *CONNECTION BOX* for *REI2*). To begin communication, the MODEM button on *EncRadio* must be rhythmically pressed 3 times. Data transmission will take place at a velocity of 1200 bit/s.

If 2 or more µGraphs commanded via Radio are being used, a special connector (ACC087) must be connected to SERIAL 1 of the first displayboard. Without this connector pins 1 and 6 of the Amphenol must be bridged.

- ***SERIAL 1 Input/Output (6 pole Amphenol)***

| | |
|---|---|
| **1** | **SERIAL 1 output RS232 TX** |
| 2 | SYNC IN |
| 3 | SERIAL 1 input RS485 + RX |
| 4 | SERIAL 1 input RS485 - RX |
| 5 | Earth (cable braiding) |
| **6** | **SERIAL 1 input RS232 RX** |




6 pole Amphenol connector

**Setup**

In Program 0 (Normal), setup allows you to re-initialize all µTAB parameters to standard values and to set the first column displayed on the displayboard. The latter configuration makes it possible to use two or more displayboards placed side by side. For example, if the displayboard is the second element of the line, the first column will have to be set to 9.

Keep LAP-SETUP pressed for at least two seconds to enter Setup

| | |
|---|---|
| *Set first* | Press LAP-SETUP |
| *column = 0* | Set the first column with START-MODIFY<br>Press LAP-SETUP |
| *Baud = 1200* | Set serial communication velocity with START-MODIFY (from 1200 bit/s to 38400 bit/s (38k4); when setting RAD., instead of using the serial connection to command µTAB, the *Linkgate* radio system is used)<br>Press LAP-SETUP |
| *INT = RS232* | Set the interface used for serial connection by using START-MODIFY (the protocols available are RS232 and RS485)<br>Press LAP-SETUP |
| *RadCh = 0* | Set the Radio channel with START-MODIFY (from 0 to 127 except channel 55)<br>Press LAP-SETUP |
| *Start to* | Press LAP-SETUP |
| *initial.* | Press START-MODIFY to confirm, LAP-SETUP to exit without initializing |
| *Sure?* | Press START-MODIFY to confirm, LAP-SETUP to exit without initializing |

## 2.2 PROGRAM 1 (MEMORY PROGRAM)

Program 1 allows you to automatically run the previously set program. This program must be stored while µTAB **is in Program 0**. To store the program, send the command '*Program Start'*, then the sequence of commands that make up the program, finally the 'Program End' command.
Besides the normal commands, a program can contain loops with instructions automatically repeated more than one time or an infinite number of times. The commands to be repeated must be preceeded by the command 'Label', which makes it possible to define the position of the program from which the commands to be repeated start. This command sequence must end with the command *'Loop-Goto*' which allows you to define the number of times the loop must be repeated.

## 2.3 PROGRAM 2 (CHRONOMETER)

In this mode µTAB works as a typical chronometer set to 1/100 of a second.

- With Start (manually, from input or via radio) the chronometer starts.
- With Lap (manually, from input or via radio) the chronometer shows an intermediate time for 5 seconds.
- With manual Start or Stop from input or via radio the chronometer stops.
- Now it is possible to set the chronometer to zero by pressing Lap.

If the chronometer is not set to zero, it will start from the value shown.

If the Autoreset time has been set to follow every Stop (or manual Start), the chronometer resets itself to zero after the preset time.

**NOTE:** If the printer is connected, times are printed, coupled to a progressive counter which is automatically set to zero every time Program 2 (Chronometer) is entered or µTAB is switched off.

***RADIO***: Program 2 (Chronometer) can also be used with a *Linkgate* system via radio. After the radio channel has been correctly set (see par. 2.1 Program 0 (Normal) on p.16) the µTAB displayboard will also accept START LAP and STOP signals coming from *Linkgate.*

**Setup**
It is possible to set the starting time of the chronometer.

Keep LAP-SETUP pressed for at least two seconds to enter Setup

| | |
|---|---|
| *Set* | |
| | Press LAP-SETUP |
| *Starttime* | |
| | Press LAP-SETUP |
| *HH = 0* | Set the hours with START-MODIFY<br>Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *mm = 0* | Set the thousandths with START-MODIFY<br>Press LAP-SETUP |
| *Autoreset* | |
| | Press LAP-SETUP |
| *Time= 0* | Set the automatic Reset time with START-MODIFY (in seconds). A time of zero disables the Autoreset function. |
| | Press LAP-SETUP |
| START-STOP | Press START-MODIFY to pass to START-START mode. In the latter case every start event starts and stops the stopwatch. |

Press LAP-SETUP

The stopwatch is now stopped on the set time, ready to start.

## 2.4 PROGRAM 3 (SPEEDMETER)

This mode allows you to measure the speed on the basis of any length. The speed is calculated on the basis of the measurement of the time interval between two **LAP-STOP input or via radio or manual LAP-START** impulses. So you need only place two photocells at the desired distance and connect them to the Lap and Stop inputs. If the bidirectional mode has been set, the measurement base can be run in both directions. Bidirectional mode is not recommended if it is not essential. The system is able to manage up to 20 transits at the same time in the measurement base.
If a delay has been set for the activation of the stored program (see "Setup" below), when this time is completed after the last measurement made, the display of the sequence stored as program is automatically started. This auxiliary function allows automatic display of information or advertising during the pauses between transits.
If the printer is connected, the speeds are printed, coupled to a progressive counter which is automatically set to zero every time you enter mode 3 or µTAB is switched off.

**NOTE**: obviously, speed measurement precision depends on the accuracy with which time is measured on the measurement base. To have a precision of 0.025 Km/h up to speeds of 130 Km/h, you need only place the photocells at least 10 m apart (using MICROGATE photocells). Increasing the distance increases measurement precision.

***RADIO***: As well as giving the manual LAP and START signals or input LAP or STOP, a *Linkgate* system via radio can be used. In this case the following options are available:

A. Use of 2 *Polifemo* photocells and 2 *Encoders* or *EncRadios.* The signal of the first *EncRadio* must be set on LAP (any), and that of the second on STOP.

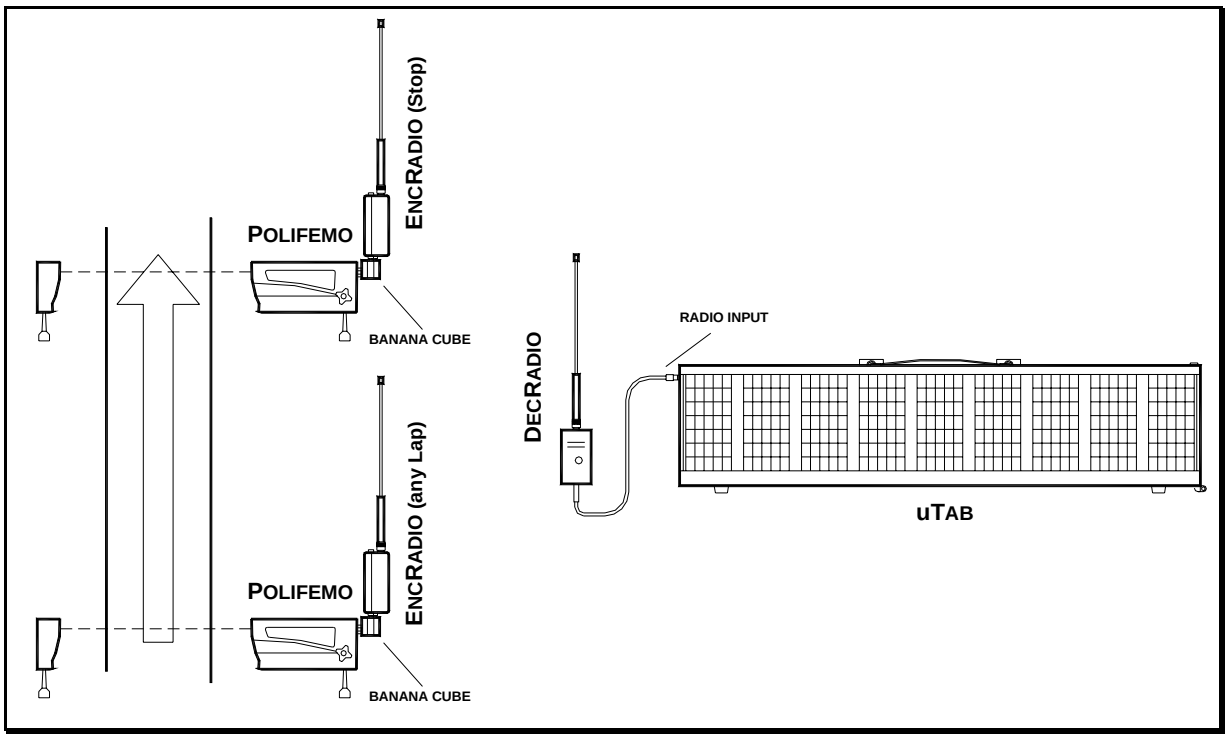



**Figure 5**

In the example shown in Figure 5, 2 *Polifemos* connected to *EncRadio* through *Banana Cube* have been used.
It is important to point out that if the *EncRadios* (or *Encoders*) have been set on LONG transmission signals, the travelling time of the length base cannot be less than 3 seconds while the time cannot be less than 1 second if SHORT signals are used.

B. Use of 2 *Polifemo* photocells and 1 *Encoder* or *Encradio*. The first photocell must be connected (2 metre CAB050 cables or 20 metre CAB048 cables) to the Red and Black banana jacks of the *Encoder* and the second to the Green and Black banana jacks. The rotating selector for the selection of the signal on the *Encoder* must be set to *LAP E*. With this option it is not possible to exploit the bidirectionality of the system or to have more than one competitor in the measurement base.

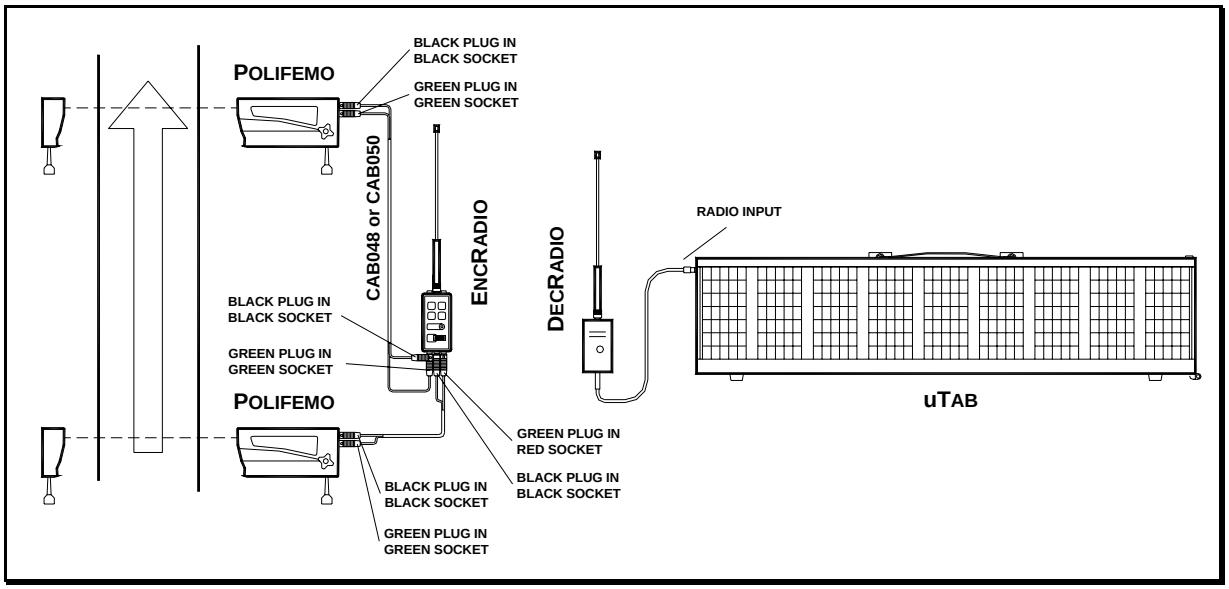



**Figure 6**

**Setup**
It is possible to set the length of the measurement base, the speed unit, the minimum and maximum speed allowed, the mono or bidirectional mode and the time lag with which the display program is automatically activated.

Keep LAP-SETUP pressed for at least two seconds to enter Setup

| | |
|---|---|
| *Speedbase* | Press LAP-SETUP |
| *Length ?* | Press LAP-SETUP |
| *km = 0* | Set the kilometers with START-MODIFY<br>Press LAP-SETUP |

| | |
|---|---|
| *m = 0* | Set the meters with START-MODIFY<br>Press LAP-SETUP |
| *cm = 0* | Set the centimeters with START-MODIFY<br>Press LAP-SETUP |
| *Set Speed* | Press LAP-SETUP |
| *Unit* | Press LAP-SETUP |
| *kmh - mph - knt - m/s* | Edit using START-MODIFY (it is possible to choose from kilometers/hour, miles/hour, knots, meters/second).<br>Press LAP-SETUP |
| *Min Speed* | Press LAP-SETUP |
| *0 Kmh* | Set minimum speed using Start-Modify (0=no checks are made; another measurement unit can appear instead of "Kmh")<br>Press LAP-SETUP |
| *Max Speed* | Press LAP-SETUP |
| *0 Kmh* | Set maximum speed using Start-Modify (0=no checks are made; another measurement unit can appear instead of "Kmh")<br>Press LAP-SETUP |
| *Bidir. = 0* | Set bidirectional mode using START-MODIFY (0=No 1=Yes)<br>Press LAP-SETUP |
| *Set Prog.* | Press LAP-SETUP |
| *Delay* | Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |

**NOTE**: Minimum and maximum speeds refer to the unit currently set.

## 2.5 PROGRAM 4 (COUNTDOWN)

This mode allows you to display different kinds of countdown. Different display modes are obtained by setting the Address selector to different values:

- Address 0

In this mode µTAB simulates a timer for the start. The beeper is activated at -10 seconds, -5, -4, -3, -2, -1 and 0 seconds from the set start time. Normally, the built-in beeper is too weak. You are therefore advised to connect the loudspeaker to the external socket on the side panel. The start device (starting gate or other) should be connected to the START-STOP-LAP-INPUTS input. At each start the deviation in minutes, seconds and thousandths relative to the scheduled starting time (with the sign - for early start, + for delayed start) is displayed in sequence.

**NOTE**: the first start is given at the first net minute shown after Program 4 (Countdown) has been activated.

**Setup**
The time intervals between successive starts, the green light time and the time displayed can be pre-set (so as to synchronize the internal clock with other devices, usually the main chronometer).
The period between each start is set to 0 and the countdown from -10 seconds starts when the LAP-SETUP key is pressed (or when the Lap input is activated).
In this way the start sequence can be set manually. In this case deviation from the scheduled start time is neither displayed nor printed.

Keep LAP-SETUP pressed for at least two seconds to enter Setup

| | |
|---|---|
| *Set* | Press LAP-SETUP |
| *Cycletime* | Press LAP-SETUP |
| *MM = 0* | Set the minutes between each start with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Set* | Press LAP-SETUP |
| *Greentime* | Press LAP-SETUP |
| *SS = 0* | Set the seconds of green light time with START-MODIFY<br>Press LAP-SETUP |
| *Set* | Press LAP-SETUP |

| | |
|---|---|
| *Sync.time* | Press LAP-SETUP |
| *HH = 0* | Set the hours with START-MODIFY<br>Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *mm = 0* | Set the thousandths with START-MODIFY<br>Press LAP-SETUP |

Now µTAB waits for a START (from key or input) for synchronization.

**NOTE**: when setting the time for synchronization, µTAB shows the time at which the setting has begun. If no value is modified, time is not changed and continues to run as if Setup had not been used. This makes it possible to edit the other parameters without losing synchronization.

- Address 1

The way this program functions is similar to that for address 0. In this case, however, at each start the starting time (minutes, seconds and thousandths) and the deviation in minutes, seconds and thousandths relative to the scheduled starting time (with the sign - for early start, + for delayed start) are displayed in sequence.

- Address 2

In this case the countdown starts from the time set by the user and stops at zero, with the last five seconds signalled with a beep.

When started, the program automatically enters Setup

| | |
|---|---|
| *Set* | Press LAP-SETUP |
| *Cycletime* | Press LAP-SETUP |
| *MM = 0* | Set the minutes between each start with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Set* | Press LAP-SETUP |

## 2.6 PROGRAM 5 (INTERNAL CLOCK)

This mode allows you to display the time on the µTAB internal clock.

**Setup**
It is possible to set the date and time of the internal clock.

**NOTE**: During time setting, µTAB shows the time at which the setting began. If no value is modified, the time is not changed and runs as if Setup had not been used.

Keep LAP-SETUP pressed for at least two seconds to enter Setup

| | |
|---|---|
| *Set* | Press LAP-SETUP |
| *R.T. Date* | Press LAP-SETUP |
| *day = 0* | Set the day with START-MODIFY<br>Press LAP-SETUP |
| *daynum = 0* | Set the day of the week with START-MODIFY<br>(1 Sunday, 2 Monday,..., 7 Saturday)<br>Press LAP-SETUP |
| *month = 0* | Set the month with START-MODIFY<br>Press LAP-SETUP |
| *year = 0* | Set the year with START-MODIFY<br>Press LAP-SETUP |
| *Set* | Press LAP-SETUP |
| *R.T. Clock* | Press LAP-SETUP |
| *HH = 0* | Set the hours with START-MODIFY<br>Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds START-MODIFY<br>Press LAP-SETUP |

## 2.7 PROGRAM 6 (INTERNAL CLOCK AND DATE)

This mode allows you to display the time and date on the µTAB internal clock.

**Setup**
It is possible to set the date and time of the internal clock.

## 2.8 PROGRAM 7 (LAP CHRONOMETER)

**NOTE***: This mode is not available on displayboards on which* Progam 11 (Parallel Self-Timing) *is enabled.*

Program 7 allows lap times timing. At each Start or Stop impulse (indifferently) the chronometer takes the time from the previous impulse and restarts automatically from zero. Time continues to be displayed for 8 seconds, then the running time appears again. The input and Lap key reset the chronometer to zero.

**NOTE:** If the printer is connected, times coupled with a progressive counter which is automatically set to zero every time Program 2 (Chronometer) is entered or µTAB is switched off, are printed.

***RADIO***: As well as giving the manual or input START, STOP and LAP signals, a *Linkgate* system via radio can be used (after correctly setting the radio channel in the menu of Program 0 (Normal)). The displayboard accepts any LAP signal.

**Setup**
It is possible to set the disactivation time of inputs after an impulse (holdoff time).

Keep LAP-SETUP pressed for at least two seconds to enter Setup

| | |
|---|---|
| *Set* | Press LAP-SETUP |
| *Dead time* | Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *mm = 0* | Set the thousandths with START-MODIFY<br>Press LAP-SETUP |

## 2.9 PROGRAM 9 (TEST)

Program 9 (Test) is used to check the correct functioning of Pixels: the displayboard becomes alternately yellow and black. If the displayboard is exposed to temperatures lower than -15°C before being used, it is advisable to leave it switched on with this program inserted (for example, outdoors at night in high mountains).

# *2.10 PROGRAM 10 (SELF TIMING)*

**NOTE:** *This mode is available only on displayboards purchased with the Self-Timing option.*

## 2.10.1 Starting Coin Box

The Starting coin box must be connected to the starting gate by connecting the special cable to the "GATE" socket on the bottom of the coin box and to the starting gate (black and green sockets). The coin box must also be connected to the finish through the"LINE" connector. For the connection between start and finish use a four-pole cable (the only specification for the cable: the total resistance of each cable should be less than 50 ohm - for example, for a 1000 m line, cables with a section of 0.25 $mm^2$ or more are sufficient). The jacks supplied must be connected to the ends of the cable, connecting poles 1, 2, 4, 6 of the jacks one at a time. Poles 3 and 5 are not used.
The third socket on the coin box is for powering a self-regulating warming resistance inside the coin box itself. This prevents the blocking of the mechanical parts of the coin box when wet or snow-covered coins are used and the external temperature is particularly low. Although it is not normally neccessary to power the resistance, you are strongly recommended to do so. The resistance must be powered at 24V (either direct or alternate). Consumption is high at the beginning (200W max). Then it stabilises at about 20W (exact consumption depends on the external temperature). The two resistance poles are connected to pins 1+2 (short-circuited) and 4+5 (short-circuited) of the "HEATING" jack.

**NOTE:** It must be stressed that if the warming resistance is not used, it is not necessary to power the coin box.

## 2.10.2 Finish displayboard

Connect the line from the Start (see previous paragraph) to the SELF-TIMING socket of THE displayboard with the jack supplied.
Connect the photocell to the START-STOP-LAP INPUTS socket of the displayboard with the cable supplied. If you wish to take the exit speed, the intermediate time photocell must also be connected. Consequently a suitable wire must be used with a connection box to connect the start and intermediate time photocells.
With regard to power supply, remember that there are three different ways of powering the MICROGATE Self-Timing (see also par. 1.3 Power supply on p.9):

A. By connecting the displayboard to the MICROGATE battery recharger/supply unit. In this way the Self-Timing is powered from the mains supply and simultaneously the batteries are kept charged by a trickle current. This guarantees perfect operation even if the mains supply is interrupted.
B. By connecting the displayboard to any direct current source (whether stabilised or not) between 10 and 40 Volts, able to provide at least 4W peak power. A car battery guarantees a few days of autonomous use.
C. By using the batteries built into the displayboard. In this case it is necessary to recharge the batteries daily with the special battery recharger.

### 2.10.3 Printer

It is possible to connect a printer with a built-in ticket cutting device to MICROGATE Self-Timing.
The printer must be connected to the SERIAL 2 port on the side panel of µTAB.
At the finish, for every competitor a card is printed for him/her to take. On the card the following information appears:

- Two lines pre-set by the user (see below)
- Date, time and the competitor's progressive number
- Competitor's time
- Best race time
- Competitor's exit speed (if the intermediate photocell has been installed)
- Best exit speed

The progressive number, the best time and the best speed are reset to zero by switching off µTAB or by passing to a mode different from Program 10.
To set the first two lines which appear on the printer it is necessary to use a Personal Computer and send the appropriate command to µTAB (on this subject, see par. 3.1.1 µTAB Serial Protocol – Self Timing on p.40). The operation is easy and immediate if you use the MICROGATE TABMICRO program.

### 2.10.4 Parallel automatic timing systems

Two or more Self-Timing systems can be installed in parallel. Each system works indipendently. However, just one printer is enough for more than one system. It must be connected, as usual, to the SERIAL 2 socket of one of the displayboards at the finish. The SERIAL 1 socket must be connected to the SERIAL 2 socket of the other µTAB using the appropriate cable.
The tickets for both tracks are issued by the only printer.
We strongly recommend you identify the two tracks in different ways and indicate this identification on the editable lines of the printer.

### 2.10.5 Operation

To activate Self-Timing just connect the system as previously described and switch on the displayboard (Power switch), making sure that the "Program" switch is on 10 (Self-Timing).
The system starts functioning automatically when the first coin is inserted. The light on the coin box can have three states:

- Red: track stopped (any possible start has no effect)
- Green: track free, the athlete can start
- Blinking Red/Green: track free, but less than 10 seconds are left to start.

The green light is coupled to a free track beeper. The beep becomes more frequent when less than 10 seconds are left to start (blinking Red/Green).
After every start the track can be stopped for a time which can be changed as desired (see next paragraph), even if there are credits left. During this time the light remains red, and no start made will be considered. The light remains red even if there are four competitors on the track simultaneously.
If a competitor falls and does not finish the run, his/her time is automatically cancelled after a maximum time that can be changed as desired (see next paragraph).

It is also possible to set a minimum race time under which Stop signals are not accepted. This minimum time has two functions. First it serves the purpose of eliminating "impossible" times (obtained, for example, if all the gates are “missed”); secondly, it prevents the time of a competitor who has abandoned the race from being assigned to another competitor who has overtaken him/her.

**NOTE**: It is not necessary to wait until the track is free before inserting the coins. The system automatically allows the number of transits that have been paid.

## 2.10.6 Parameters setting

When you enter the Self-Timing program, or when the displayboard is switched on, the question "Setup?" appears for about 3 seconds. If during this period the Lap key (Setup) is kept pressed for at least two seconds, you access the parameters which regulate Self-Timing. The settings available are listed below.

| | |
|---|---|
| *Set* | Press LAP-SETUP |
| *Max. Time* | Setting of the maximum race time, after which the racer is presumed to have fallen (the chronometer resets itself to zero or passes to the timing of the next competitor).<br>Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Set* | Press LAP-SETUP |
| *Min. Time* | Minimum race time under which the Stop impulses are not accepted<br>Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Set* | Press LAP-SETUP |

| | |
|---|---|
| *Greentime* | Setting of the time each racer has for the start (green light time), including the 10 seconds of blinking light.<br>**NOTE**: the maximum time allowed is 9 minutes and 59 seconds. Two values have a special meaning: - 10 minutes and 0 seconds: the light remains green for an infinite time after each enablement until the enablement is used with a start.<br>- 0 minutes and 0 seconds: the track is always free and coins do not need to be inserted. This setting is useful when you want to use the system to time a race, or when the payment of the races is not necessary or is managed by other devices. The light turns red only after each start for the minimum time between one start and the next. |
| *MM = 0* | Set the minutes with Start-Modify<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Set MIn* | Press LAP-SETUP |
| *STARTDIFF* | Setting of minimum time between two starts. During this time the light is red and starts are not accepted even if there is a backlog of enablements.<br>Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Speedbase* | Press LAP-SETUP |
| *Length ?* | Setting of the distance between the intermediate time and finish photocells for speed measurement.<br>Press LAP-SETUP |
| *Km = 0* | Set the kilometers with START-MODIFY<br>Press LAP-SETUP |
| *m = 0* | Set the meters with START-MODIFY<br>Press LAP-SETUP |

| | |
|---|---|
| *cm = 0* | Set the centimeters START-MODIFY<br>Press LAP-SETUP |
| *Set Speed* | Press LAP-SETUP |
| *Unit* | Press LAP-SETUP |
| *kmh - mph - knt - m/s* | Edit using Start-Modify (it is possible to choose from kilometers/hour, miles/hour, knots, meters/second).<br>Press LAP-SETUP |
| *Set Prog.* | Press LAP-SETUP |
| *Delay* | Press LAP-SETUP |
| *MM = 0* | Set the minutes with START-MODIFY<br>Press LAP-SETUP |
| *SS = 0* | Set the seconds with START-MODIFY<br>Press LAP-SETUP |
| *Number of* | Press LAP-SETUP |
| *Linefeeds* | Press LAP-SETUP |
| *N_lf = 0* | Setting of the length of the paper that comes out of the printer (optional) to set the correct length of the ticket - Edit using START-MODIFY. |

**NOTE:** The setting of Self-Timing parameters by means of PC is not possible if µTAB is in Program 10 (Self Timing). In this mode the only command accepted is '*Run Hardware Program'* (see 3.1 Appendix A on p.48). Go to Program 0 (Normal) before sending the parameters.

## 2.10.7 Default value of editable parameters

When µTAB is delivered, or after every global initialization (see par. 2.1 Program 0 (Normal) on p.18 in the general instructions), the configurable parameters are automatically set to the following values (often suitable for many applications):

- Maximum Race Time 1' 30"
- Minimum Race Time 0' 0" (Stop is always enabled)
- Green Light Time 1'
- Minimum Start between two starts 0' 20"
- Speed Base Length 10 meters
- Speed unit Km/h
- Delay Time of Program Activation 0' 15" (obviously the program does not start if it has not been previously stored!!!).
- Printer paper length 0

## 2.10.8 Some suggestions

- Avoid reducing the minimum time between two starts excessively as it can be dangerous to have racers starting at very short time intervals.
- Also avoid excessive reduction of the green light time, that is, the time that each racer has for starting. Although the reduction of this parameter makes it possible to reduce the waiting time at the start, too short a time can be unpleasant for customers, who find themselves obliged to rush their starts.
- If the photocell is used to take the exit speed, place it at least 8 - 10 meters before the finish photocell to guarantee the necessary measurement precision (see also general instructions, par.2.4 Program 3 (Speedmeter) on p.22).

# *2.11 PROGRAM 11 (PARALLEL SELF TIMING)*

**NOTE:** *This mode is available only on displayboards purchased with the Parallel Self-Timing option*

## 2.11.1 Connections

**A. START FINISH CABLE**
Connect the "Self-Timing" socket on the displayboard TAB to the LINE socket on the coin box, using a six-polecable. Jacks must be connected 1 to 1 (1 to 1, 2 to 2, etc.). For cable characteristics, see par. 2.10 Program 10 (Self Timing) on p.31.
**B. STARTING GATES**
The starting gates must be connected to the "GATE" socket on the coin box. The cable supplied is double and makes possible the connection of both gates. One of the terminals is marked yellow. We will refer to the track with the yellow cable as "Track B", the other as "Track A".
**C. PHOTOCELLS**
Photocells must be connected to the START-STOP-LAP INPUTS socket of the displayboard. In particular, the photocell for track A must be connected to the Stop line and the one for track B to the Lap line.
Yellow-marked wires are for Lap.

**NOTE**: In "Parallel Self-Timing" it is not possible to take the exit speed.

## 2.11.2 Operation

To select the "Parallel Self-Timing" mode, set the PROGRAM rotating switch to 11.
The operation is exactly the same as the one described in par 2.10 Program 10 (Self Timing) on p.31.
However, there are some distinctive features:

- **PARALLEL RACE SELECTION:**

Before inserting the coins, press the red button next to the the coin slot in the coin box .
After pressing, you have one minute to insert two coins and enable the start. The time between two consecutive starts for the parallel (Track A and Track B) must not exceed 8 seconds. This remaining time is indicated by blinking Red/Green and the beep.
On the displayboard the running time of the first racer to start is displayed with the track indication. At the finish, first the time of the first racer to finish will appear, then the time of the other athlete and finally the time difference with the indication of the winner.

- **SINGLE RACE SELECTION:**

The operation is exactly the same as Program 10 (Self Timing). To be enabled, you only need a coin and **the red button does not have to be pressed**. The racer can choose to start either on track A or on track B.
Also for parallel Self-Timing it is possible to have up to 8 racers maximum or couples of racers on the track.
For setting of parameters see Program 10 (Self Timing) on p.31.

**NOTE**: the settings are common to both modes (normal and parallel). Therefore, a change in settings made in Program 10 (Self Timing) is also reflected in the functioning of Program 11 (Parallel Self Timing) and viceversa.

## 2.12 DEFAULT VALUES OF EDITABLE PARAMETERS

When µTAB is delivered or after each global initialization (see 2.10 Program 10 (Self Timing) p.18), the configurable parameters are automatically set to the following values (often suitable for many applications):

**Program 0 (Normal)** page 16

- Column 0
- Baud 1200 bit/s
- Frame RS232
- RadCh 0

**Program 2 (Chronometer)** page 19

- Starting Time 0
- Autoreset Time 0 (disabled)

**Program 3 (Speedmeter)** page 21

- Speed base length 10 meters
- Speed measurement unit Km/h
- Minimum speed 3
- Maximum speed 0 (no control is made)
- Bidirectionality 0 (No)
- Program activation delay 0' 15" (Attention: the program does not start if it has not been previously stored)

**Program 4 (Countdown)** page 24

- Start Cycle 0' 30"
- Green light time 6" (from -3 to +3 in relation to the scheduled time)

**Program 7 (Lap Chronometer)** page 28

- Holdoff
- time 0.2 sec.

**NOTE**: Also the time and date are preset to particular values.

# 3
# APPENDIX

# 3.1 APPENDIX A

## 3.1.1 µTAB Serial Frame – Self Timing

**(1200 BAUD, 8 BIT, 1 STOP, PARITY NONE - 1200 8N1)**

The table below gives the fields of which the commands that can be given to uTAB are composed.

| Field | Length | Conten. | Meaning |
|---|---|---|---|
| Start of Frame | 1 | ESC (0x1B) | Start of Command frame |
| Address | 1 | A...Q,‘ ’ | Line identifier, Blank for broadcast |
| Command | 1 | (Any) | Command to be sent to Displayboard (see below) |
| Data | Variable | Variable | Optional command data area |
| Frame end | 1 | ETX (0x03) | End of Command frame |
| Checksum | 1 | Variable | 7 bit checksum performed on entire frame |

**NOTE:** the µTAB communication protocol uses ASCII characters. Therefore numerical values should be expressed with characters, not as a binary value. For example, a delay of 100 hundredths of a second should be expressed as ‘0’ ‘0’ ‘1’ ‘0’ ‘0’ (that is, Hex 30, Hex 30, Hex 31, Hex 30, Hex 30), and not with the binary value 100 (Hex 64).

The table below gives the various commands which can be used in the Command field:

| Command | Command Code | |
|---|---|---|
| • Date Display | A | Dec. 65 - Hex 41h |
| • Program start | B | Dec. 66 - Hex 42h |
| • Time setting sensitive to break | C | Dec. 67 - Hex 43h |
| • Time setting not sensitive to break | c | Dec. 99 - Hex 63h |
| • Break setting (breaks the execution of following commands) | D | Dec. 68 - Hex 44h |
| • Date setting | d | Dec. 100 - Hex 64h |
| • Entry Point/Label for loops | E | Dec. 69 - Hex 45h |
| • Program end | K | Dec. 75 - Hex 4Bh |
| • Loop/Goto | L | Dec. 76 - Hex 4Ch |
| • Internal clock time setting (Real Time Clock) | M | Dec. 77 - Hex 4Dh |
| • Internal clock time display (Real Time Clock) | N | Dec. 78 - Hex 4Eh |
| • Running string writing | O | Dec. 79 - Hex 4Fh |
| • Stop running string | o | Dec. 111 - Hex 6Fh |
| • Internal hardware program execution | P | Dec. 80 - Hex 50h |
| • Self-Timing printer strings | p | Dec. 112 - Hex 70h |
| • "Weak" displayboard reset (sensitive to Break) | R | Dec. 82 - Hex 52h |
| • "Strong" displayboard reset (not sensitive to Break) | r | Dec. 114 - Hex 72h |
| • Fixed string writing | S | Dec. 83 - Hex 53h |
| • Parameters setup | s | Dec. 115 - Hex 73h |
| • Display of set time | T | Dec. 84 - Hex 54h |

#### *3.1.1.1 Date display*

| **Date display** | | |
|---|---|---|
| **Command Code** | **'A'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Position (column) | 2 | 00 = first character on the left |
| Mode | 1 | 0=disabling<br>1=GG/MM/AA<br>2=GG MMM AA |

#### *3.1.1.2 Time setting sensitive to break*

| **Time setting sensitive to break** | | |
|---|---|---|
| **Command Code** | **'C'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| HHMMSSCC | 8 | hours minutes seconds hundredths |

#### *3.1.1.3 Time setting not sensitive to break*

| **Time setting not sensitive to break** | | |
|---|---|---|
| **Command Code** | **'c'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| HHMMSSCC | 8 | hours minutes seconds hundredths |

#### *3.1.1.4 Break setting (breaks the execution of following commands)*

| **Break setting (breaks the execution of following commands)** | | |
|---|---|---|
| **Command Code** | **'D'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Delay | 5 | Delay duration in hundredths |

### *3.1.1.5 Date setting*

| **Date setting** | | |
|---|---|---|
| **Command Code** | **'d'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Date | 6 | DDMMYY format |
| Day | 1 | 1=Sunday 2=Monday ... |

### *3.1.1.6 Internal clock time setting (Real Time Clock)*

| **Internal clock time setting (Real Time Clock)** | | |
|---|---|---|
| **Command Code** | **'M'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| HHMMSSCC | 8 | hours minutes seconds hundredths |

### *3.1.1.7 Internal clock time display (Real Time Clock)*

| **Internal clock time display (Real Time Clock)** | | |
|---|---|---|
| **Command Code** | **'N'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Position (column) | 2 | 00 = first character on the left |
| Mode | 1 | 0 = disabling<br>1 = format HH:MM:SS<br>2 = format MM:SS<br>3 = format HH:MM 24h (ex. 15.25)<br>4 = format HH:MM 12h (ex. 3:25 PM) |

### *3.1.1.8 Running string writing*

| **Running string writing** | | |
|---|---|---|
| **Command Code** | **'O'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Position (column) | 2 | 00 = first character on the left |
| N° of columns involved | 2 | 0 < n <= 81 |
| Delay of string motion | 3 | In hundredths |
| String | <=255 | Characters to be written |

### *3.1.1.9 Stop running string*

| **Stop running string** | | |
|---|---|---|
| **Command Code** | **'o'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| HHMMSSCC | 8 | hours minutes seconds hundredths |

### *3.1.1.10 Internal hardware program execution*

| **Internal hardware program execution** | | |
|---|---|---|
| **Command Code** | **'P'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| N° of program | 2 | 00 = 1st program (as for switch) |

### *3.1.1.11 Self-Timing printer strings*

| **Self-Timing printer strings** | | |
|---|---|---|
| **Command Code** | **'p'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Row 1 | 35 | 1st string |
| Row 2 | 35 | 2nd string |

### *3.1.1.12 "Weak" displayboard reset (sensitive to Break)*

| **"Weak" displayboard reset (sensitive to Break)** | | |
|---|---|---|
| **Command Code** | **'R'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| None | | |

### *3.1.1.13 "Strong" displayboard reset (not sensitive to Break)*

| **"Strong" displayboard reset (not sensitive to Break)** | | |
|---|---|---|
| **Command Code** | **'r'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| None | | |

### *3.1.1.14 Fixed string writing*

| **Fixed string writing** | | |
|---|---|---|
| **Command Code** | **'S'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Position (column) | 2 | 00 = first character on the left |
| String | <=81 | Characters to be written |

### *3.1.1.15 Parameters setup*

| **Parameters setup** | | |
|---|---|---|
| **Command Code** | **'s'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Subcommand | 1 | Alphabetic character (see below) |
| Parameter | X | See below |

**Parameters Setup Subcommands**

| | | |
|---|---|---|
| **Countdown** | | |
| A | 999 | Countdown duration - 11<n≤500 (0=-10 sec., manual) |
| B | 999 | Valid Start Time - 0≤n≤500 |
| **Selftiming** | | |
| C | 999 | Minimum time between two athletes - 10<n≤500 |
| D | 999 | Maximum Track Time - 10<n≤500 |
| I | 999 | Minimum Track Time - n≥0 |
| E | 999 | Auto Program Time - 0≤n≤500 |
| F | 9999999 | Speed Base Length in mt. - 0≤n≤50000.00 |
| L | 999 | Green Light Time - 0≤n≤600 (0=**xxx** - 600=always green) |
| M | 999 | Number of Line-feeds of printer paper - 0≤n≤255 |
| U | 999 | Unit (000=m/s 001=Kmh 002=mph 003=knt) |
| **SpeedMeter** | | |
| G | 999 | Auto Program Time - 0≤n≤500 |
| H | 9999999 | Speed Base Length in mt. - 0≤n≤50000.00 |
| u | 999 | Unit (000=m/s 001=Kmh 002=mph 003=knt) |
| S | 999 | Maximum Speed - n≥0 |
| s | 999 | Minimum Speed - n≥0 |
| d | 999 | Bidirectionality 0≤n≤1 |
| **Normal** | | |
| N | 999 | First displayed column - 0≤n≤81 |
| **ChronoLap** | | |
| I | 9999999 | Holdoff Impulse - 5≤n≤50000 |

### *3.1.1.16 Display of set time*

| **Display of set time** | | |
|---|---|---|
| **Command Code** | **'T'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Position (column) | 2 | 00 = first character on the left |
| Mode | 1 | 0 = disabling<br>1 = format HH:MM:SS<br>2 = format MM:SS<br>3 = format HH:MM 24h (ex. 15.25)<br>4 = format HH:MM 12h (ex. 3:25 PM) |

*The following 4 commands are used for setting "programs" (series of operations to be performed in sequence:*

### *3.1.1.17 Program start*

| **Program start** | | |
|---|---|---|
| **Command Code** | **'B'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| None | | |

### *3.1.1.18 Program end*

| **Program end** | | |
|---|---|---|
| **Command Code** | **'K'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| None | | |

### *3.1.1.19 Entry Point/Label for loops*

| **Entry Point/Label for loops** | | |
|---|---|---|
| **Command Code** | **'E'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Label name | 1 | From 0 to 9 |

### *3.1.1.20 Loop/Goto*

| **Loop/Goto** | | |
|---|---|---|
| **Command Code** | **'L'** | |
| **Data** | | |
| ***Item*** | ***Length (bytes)*** | ***Notes*** |
| Label name | 1 | From 0 to 9 |
| Loop number | 2 | 00 = infinite loop |

**NOTE**: numerical parameters with more than one digit must be padded (on the left) with zeros if they occupy fewer characters than those fixed.

**EXAMPLE**: running string ("Microgate") on line A, starting from first column, number of columns involved 9, delay 30 hundredths:

ESC - A - **O** - 00 - 09 - 030 - Microgate - ETX - Chk

# *3.2 APPENDIX B*

## 3.2.1 Connection of starting coin box

**1. Line**

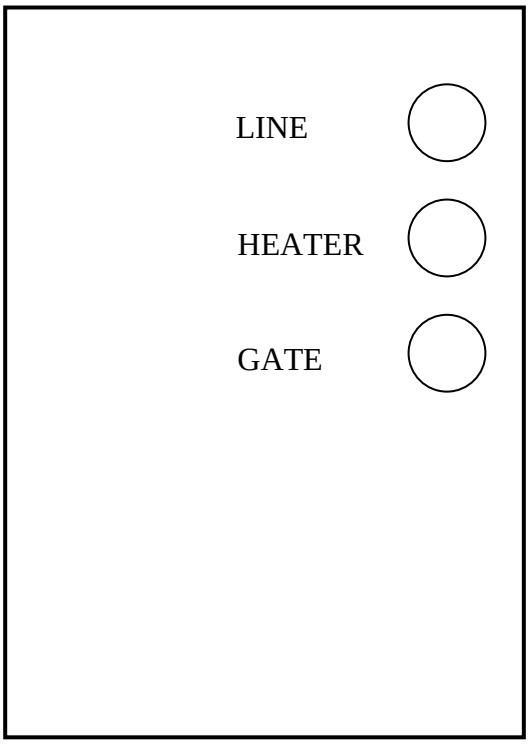
1 Start
2 Enables
3 Parallel enables
4 Red line
5 Start 2
6 Green line

**2 Heater**

1 Pole 1
2 Pole 1
3 Not used
4 Pole 2
5 Pole 2
6 Not used

**3. Gate**

1 Start (NO - Normally Open)
2 Not used
3 Ground
4 Not used
1 Start 2
6 Not used




BOTTOM VIEW

# *3.3 APPENDIX C*

## 3.3.1 Version with interface for different chronometers

### *3.3.1.1 Program 12 – Omega OSM6 Chronometer*

Program 12 makes it possible to connect the displayboard to the Omega OSM6 Chronometer.

### *3.3.1.2 Program 13 – Omega Powertime Chronometer*

Program 13 makes it possible to connect the displayboard to the Omega Powertime Chronometer. By setting the Address selector to different values, different display modes are obtained.

**ADDRESS 0**
Display of the time with a precision of hundredths of a second and the competitor number. Set the Powertime chronometer for the display of the hundredths of a second.
The data is displayed as follows:


**ADDRESS 1**
Display of the time with a precision of tenths of a second and the competitor number. Set the Powertime chronometer for the display of the tenths of a second.
The data is displayed as follows:


**ADDRESS 2**
Display of the time with a precision of seconds and the competitor number. Set the Powertime chronometer for the display of the seconds.
The data is displayed as follows:


**ADDRESS 3**
Display of the speed and the competitor number. Set the Powertime chronometer for the display of the speed.
The data is displayed as follows:

**NOTE**: to return to the other function modes you must turn the rotating selector. The calculator command does not function as in the “Powertime Emulation” program communication velocity is different from the one usually used.

#### *3.3.1.3 Program 14 – ALGE Chronometer*

Program 14 makes it possible to connect the displayboard to the ALGE Chronometer.
By setting the Address selector to different values, different display modes are obtained.

**ADDRESS 0**
Displays minutes, seconds and thousandths (or tenths or hundredths according to the precision of the work) in the following format:


**ADDRESS 1**
Displays hours, minutes and seconds in the following format:


**ADDRESS 2**
Displays hours, minutes and seconds and tenths in the following format:


**ADDRESS 3**
Displays number and position in the following format:


**ADDRESS 4**
Is used with two µTAB displayboards (master and slave, or two masters, the second of which should be configured for the display of characters from position 9 on).
The competitor number, the present position and the time in the format minutes, seconds, tenths-hundredths-thousandths are displayed:



**ADDRESS 5**
Similar to the previous program, but with the time displayed in the format hours-minutes-seconds-tenths/hundredths.



**ADDRESS 6**
The time is displayed in the format hours-minutes-seconds-tenths:


**ADDRESS 7**
The time is displayed in the format hours-minutes-seconds:


**ADDRESS 8**
Displays minutes, seconds and thousandths (or tenths or hundredths according to the precision of the work) in the following format:


**ADDRESS 9**
Displays hours, minutes and seconds in the following format:


**ADDRESS 10**
Displays hours, minutes and seconds and tenths in the following format:


**NOTE**: to return to the other function modes you must turn the rotating selector. The calculator command does not function as in the “Powertime Emulation” program communication velocity is different from the one usually used.

### *3.3.1.4 Program 15 – Omega/Longines 5005/Ares Chronometers*

Program 15 makes it possible to connect the displayboard to the Omega or Longines 5005 or Ares Chronometers. By setting the Address selector to different values, different display modes are obtained.

**ADDRESS 0**
Compatible with the programs ML 582 (Mass sport), ML590 (Road Cycling), ML584 (Show jumping) etc.
It makes it possible to display the running or final time (in the format minutes, seconds, and tenths-hundredths-thousandths) and also the number and position. Two displayboards are used (master and slave, or two masters, the second of which should be configured for the display of characters from position 9 on).
The data is displayed in the following format:


**ADDRESS 1**
Compatible with the programs ML 582 (Mass sport), ML590 (Road Cycling), ML584 (Show jumping) etc.
Similar to the previous program. The time is displayed in the format hours-minutes, seconds-tenths:


**ADDRESS 2**
Compatible with the ML programs.
Similar to the previous program. The time is displayed in the format hours-minutes, seconds:


**ADDRESS 3**
Compatible with the programs ML 582 (Mass sport), ML590 (Road Cycling), ML584 (Show jumping) etc.
Displays only number and position:

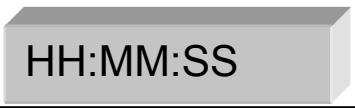

**ADDRESS 4**
Compatible with the program ML 582 (Mass sport).
Displays number and position, in four-figure format:


**ADDRESS 5**
Compatible with the program ML 683 (Car-Motorbike).
Displays LAP time in the following format:


**ADDRESS 6**
Compatible with the program ML 683 (Car-Motorbike).
Displays speed in kilometres per hour, in the following format:


**ADDRESS 7**
Compatible with the program ML 683 (Car-Motorbike).
Displays speed in miles per hour, in the following format:


**ADDRESS 8**
Compatible with the programs ML 582 (Mass sport), ML590 (Road Cycling), ML552/553 (Alpine skiing and Nordic skiing), ML597 (Horse racing), ML 566 (Track skating).
Displays the time of day in the following format:



**ADDRESS 9**
Compatible with the programs ML 566 (Track skating).
Displays the time, number and position of competitor B in the following format:


**ADDRESS 10**
Compatible with the programs ML 566 (Track skating).
Displays the time, number and position of the leading competitor in the following format:


**ADDRESS 11**
Compatible with the programs ML 566 (Track skating).
Displays the lap time of competitor A in the following format:


**ADDRESS 12**
Compatible with the programs ML 566 (Track skating).
Displays the lap time of competitor B in the following format:


**ADDRESS 13**
Compatible with the programs ML 566 (Track skating).
Displays the number and 'status' (in/out) of competitors A and B in the following format:


**ADDRESS 14**
Compatible with the programs ML 566 (Track skating).
Displays the number and laps to go for competitors A and B in the following format:


**NOTE**: to return to the other function modes you must turn the rotating selector. The calculator command does not function as in the "Powertime Emulation" program communication velocity is different from the one usually used.

### *3.3.1.5 Note for connection of chronometers*

**OMEGA/LONGINES 5005 CHRONOMETERS**

| **Chronometer** | **Displayboard** |
|---|---|
| 4 – TX+ | 5 – GND |
| 3 – TX- | 6 – Serial IN |

**ALGE CHRONOMETERS**

| **Chronometer** | **Displayboard** |
|---|---|
| 3 – GND | 5 – GND |
| 5 – Serial OUT | 6 – Serial IN |

**OMEGA POWERTIME CHRONOMETERS**

| **CHRONOMETER (RJ4 socket)** | **CHRONOMETER (9 pole Cannon)** | **Displayboard** |
|---|---|---|
| 1 – TX+ | 1 – TX+ | 5 – GND |
| 3 – TX- | 9 – TX- | 6 – Serial IN |

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