MICROBUS

Microbus Electronic Service AB
Electronic signs since 1983

Watertime MPS-WTxx

Timing system for water slides

Best laptime: 23.78
Laptime: 34.89
Speed (km/h): 19.7
Previous lap: 26.60

6.95 Sek
BÄSTA TID
11.92 Sek
ÅKTID

- Measuring and showing seconds, tenths, and hundredths and speed, latest run times and best time.
- Possible to connect several displays to the same system.
- Emergency stop function
- Stop signal function from external signal, eg water pump, with adjustable delay.
- All parts are waterproof to fit in the wet enviroment.
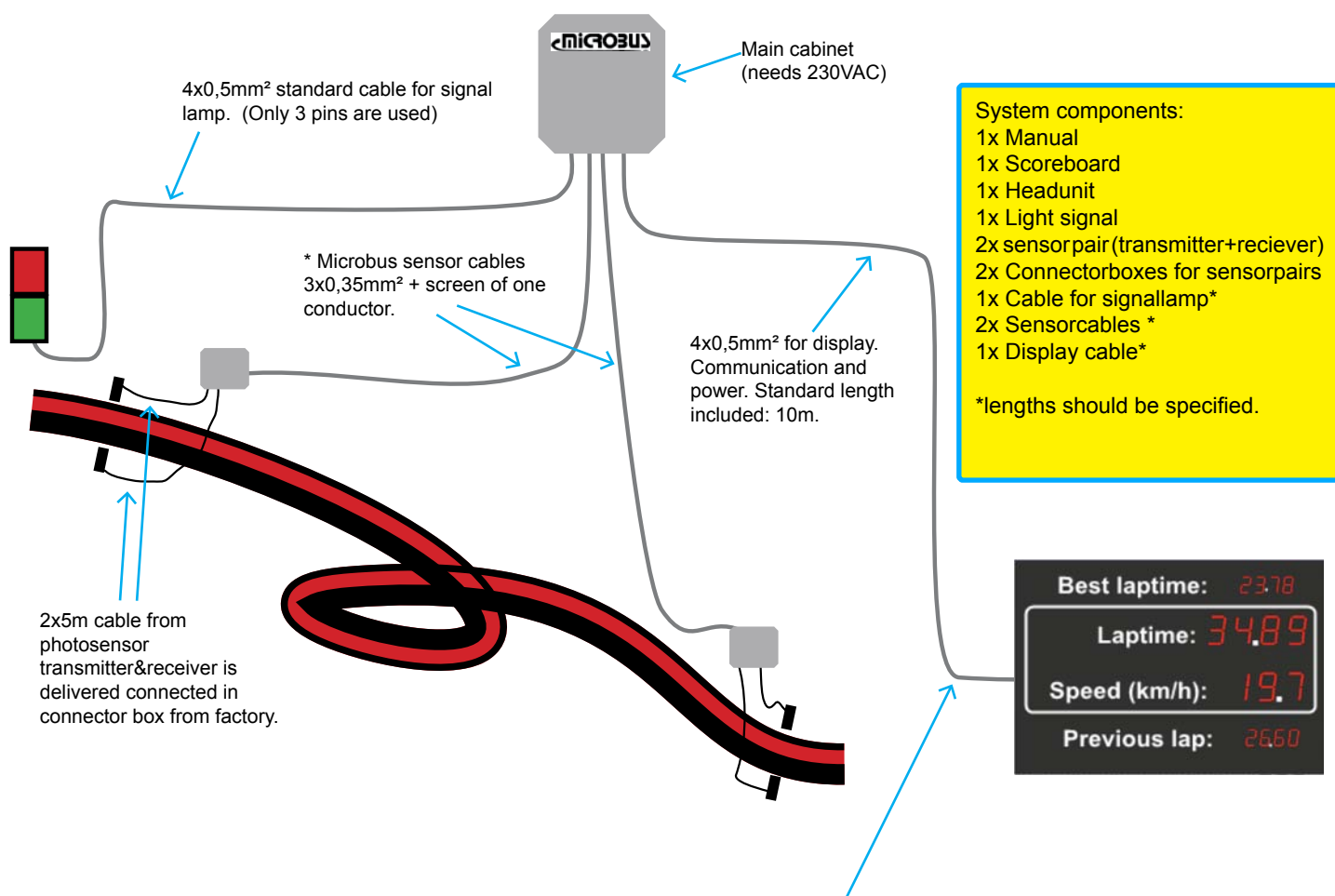
MICROBUS

Introduction

<u>PLEASE TAKE YOUR TIME READING THIS MANUAL THROUGH BEFORE INSTALLING.</u>

Watertime MPS-WTxx replaces microbus previous timing systems for water slides. The hardware that controls the timing is located in the cabinet together with photo sensor amplifier, relays and connectors. The displayboard that is used in the system is taken from Microbus well proven industrial components. This ensures a longlife system and the easy way of setting up the system gives an advantage during installation, rebuilding and service. The system is controlled by hardware processor and does not use PC or any other OS-driven computer. This method decreases the risk of failure significantly.

The main function is visualization of time and/or speed on the board together with controlling the red/green light depending on there is a person in the slide or not. To make speed measurement the length of track must be set on the main controller board in the cabinet.

The system includes possibility to connect emergency buttons and the use of external safety signal to confirm that the slide is filled with water and is function properly.

If any damage have occured on photo sensors in the slide the system can be switched into interval mode for switching red/green light in constant intervals during repair. This allows the slide to always be safe to use even when someting happens.

4x0,5mm² standard cable for signal lamp. (Only 3 pins are used)

Main cabinet (needs 230VAC)

* Microbus sensor cables 3x0,35mm² + screen of one conductor.

4x0,5mm² for display. Communication and power. Standard length included: 10m.

2x5m cable from photosensor transmitter&receiver is delivered connected in connector box from factory.

System components:
1x Manual
1x Scoreboard
1x Headunit
1x Light signal
2x sensor pair (transmitter+reciever)
2x Connectorboxes for sensorpairs
1x Cable for signallamp*
2x Sensorcables *
1x Display cable*

*lengths should be specified.

Best laptime: 23.78
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* MORE ABOUT THE WIRING OF THE SCOREBOARDS:

The communication to the display is done via 1 pair RS485.
This allows easy cabling and also power in one 4 wire-cable. However individual shielded twisted pair cable should be used with distances above 50m. Microbus provides good quality data cables to low prices.

The longer cable you use the more imortant it becomes that the cable is a shielded twisted cable.

<u>Note</u> For simplicity reasons the display system is normally delivered 10m unshielded cable. This cable is 4-wire for both voltage and communication.

This cable can be extended but for longer distances greater than about 50m between the main unit and the display itself, there should be a seperate power supply used for the display and a twisted-pair data cable used for communication. If this requisite is required then the length of cables must be specified when ordered.
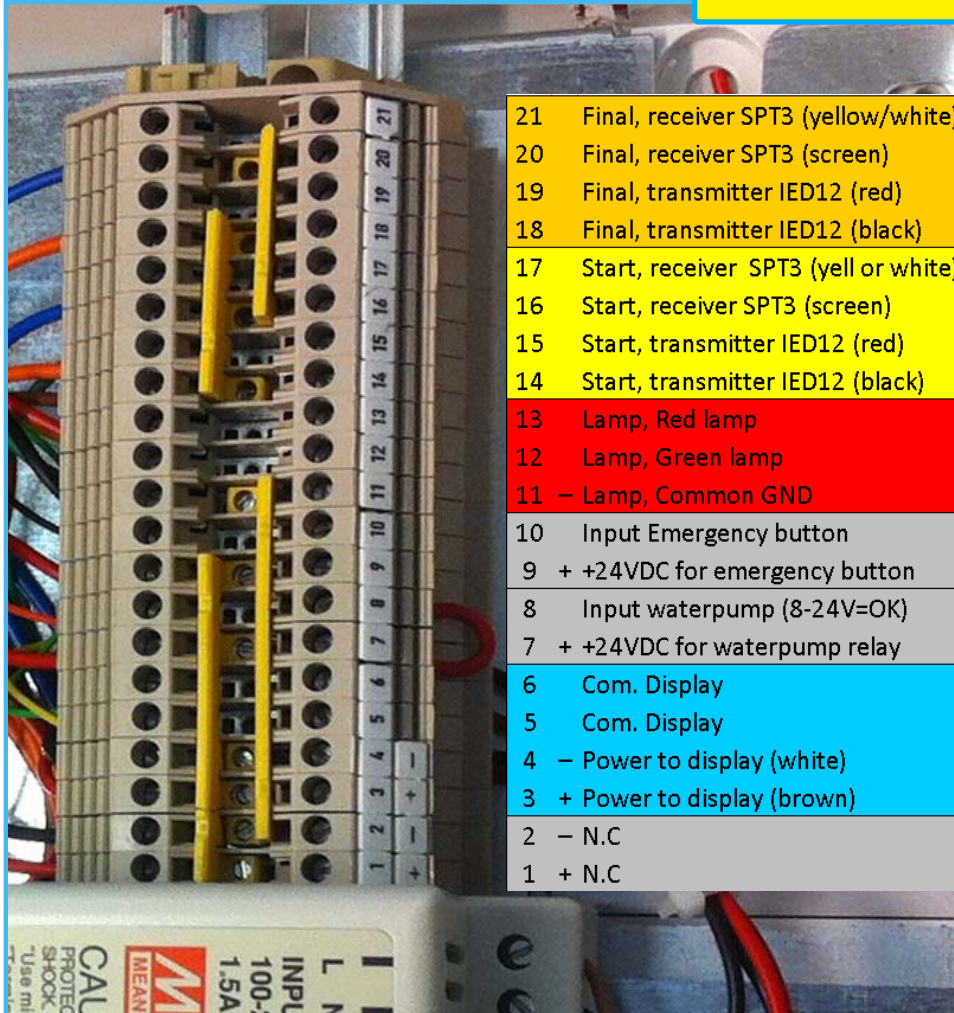
Cabinet
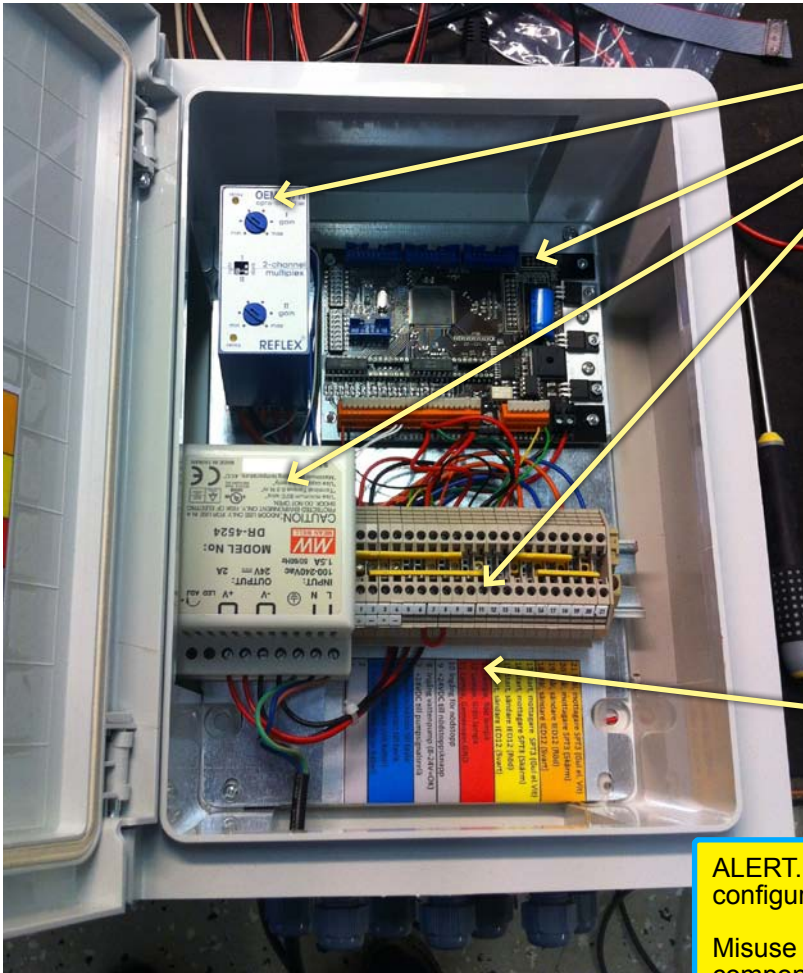
Cabinet contains:

A. 1x Photosensor driver/amplifier
B. 1x CPUboard
C. 1x Power supply 24VDC
D. 21x Connectors

All connection for installation is made on the connectors bottom side.

ALERT. Older cabinets can deviate in layout and configuration compared to the this manual.

Misuse or installation errors can destroy expensive components, please ask for advice if necessary.
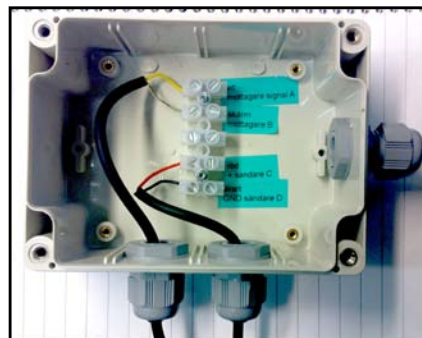

21	Final, receiver SPT3 (yellow/white)
20	Final, receiver SPT3 (screen)
19	Final, transmitter IED12 (red)
18	Final, transmitter IED12 (black)
17	Start, receiver SPT3 (yell or white)
16	Start, receiver SPT3 (screen)
15	Start, transmitter IED12 (red)
14	Start, transmitter IED12 (black)
13	Lamp, Red lamp
12	Lamp, Green lamp
11 −	Lamp, Common GND
10	Input Emergency button
9 +	+24VDC for emergency button
8	Input waterpump (8-24V=OK)
7 +	+24VDC for waterpump relay
6	Com. Display
5	Com. Display
4 −	Power to display (white)
3 +	Power to display (brown)
2 −	N.C
1 +	N.C

Connectors
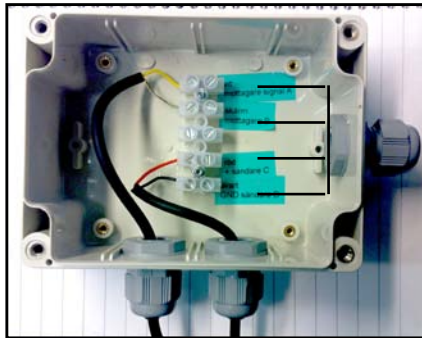
Connecting box for photosensor at slide end.

Connecting box for photosensors at slide start.
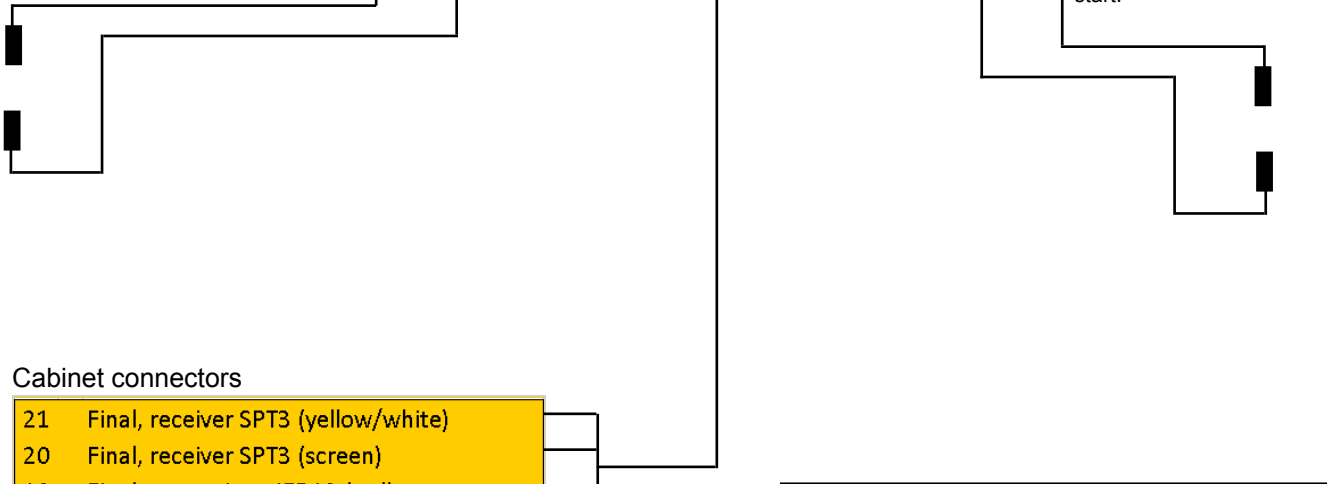
Cabinet connectors

21	Final, receiver SPT3 (yellow/white)	
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17	Start, receiver SPT3 (yell or white)	
16	Start, receiver SPT3 (screen)	
15	Start, transmitter IED12 (red)	
14	Start, transmitter IED12 (black)	
13	Lamp, Red lamp	2: Upper lamp (Red)
12	Lamp, Green lamp	1: Lower lamp (Green)
11 −	Lamp, Common GND	0: Common (white)
10	Input Emergency button	
9 +	+24VDC for emergency button	
8	Input waterpump (8-24V=OK)	
7 +	+24VDC for waterpump relay	
6	Com. Display	
5	Com. Display	
4 −	Power to display (white)	
3 +	Power to display (brown)	
2 −	N.C	
1 +	N.C	

Not normally used.
Emergency stop switch can be orederd as an

N.B. Should be between 7 and 8, if the function is not used. (Error code: "HELP").

Lampfoot

2: Upper lamp (Red)
1: Lower lamp (Green)
0: Common (white)
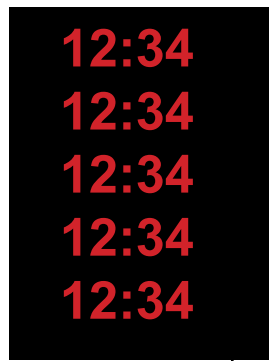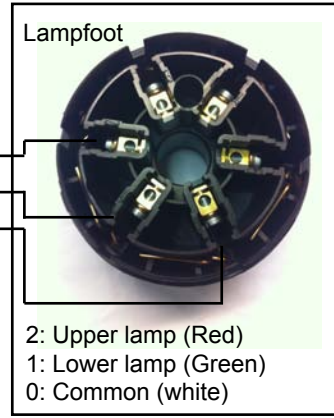
The scoreboard design is available in different models and performance. It's also easy to customzie as needed.

OBS. Use testmode when adjusting the photocells.

DIP-Block 1	DIP-Block 2	Comment:
		Testmode for installing and adjusting photocells On display: "H" emergency button signal "P" water pump signal "1" Start sensor active "2" Final sensor active

Silikon

Adjusting the strength of the photocell transmitter

Start sensor

Lightmode: Dark

Final sensor
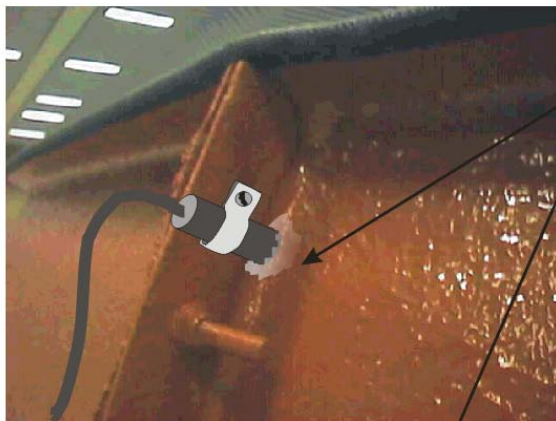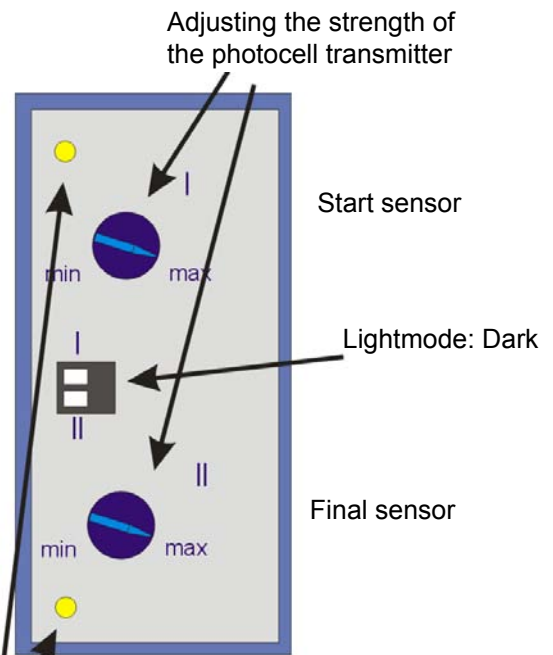
The LED should temporarily flash when a rider is trigging a sensor.

The transmitter and receiver are mounted facing each other on opposite sides of the water slide. For best placement of the transmitter/receiver, you should before installation mark the spot of the waterline on the slide. Drill the hole for the transmitter/receiver 5-10 centimeters above the waterline. The hole most have a diameter of 8 millimeters. Continue installing the cable in the seam like the picture shows. When mounted apply silicion around the the hole and the sensor. The photocells have an operation range between -20C to +60C. If photocells are mounted outside in cold areas there might occur a problem because it might be below the operation range in the start before the water gest warmer. You can adjust the strength of the transmitter on the OEM207-unit. Check the LED so it only lits up when someone passes. If the testmode is activated the rider will be notified on the scoreboard as well.

NOTE:
The transmitter/receiver doesn't need to be inserted through the hole, it could as well lay down centered on the hole so it covers and the top of the photocell almost reaches the level of the waterslide. The hole cannot be bigger than 8 millimeters because it's the limit to make sure a childs finger cannot get stuck in it in case of a sensor would loosen and fall out.

Headunit:

21	Final, receiver SPT3 (yellow/white)
20	Final, receiver SPT3 (screen)
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18	Final, transmitter IED12 (black)
17	Start, receiver SPT3 (yell or white)
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5	Com. Display
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2 −	N.C
1 +	N.C

Emergency stop buttons can be used to instant switch the light to red. For example when a lifeguard discovers that something has happened on the slide.

Push button type emergency stop.
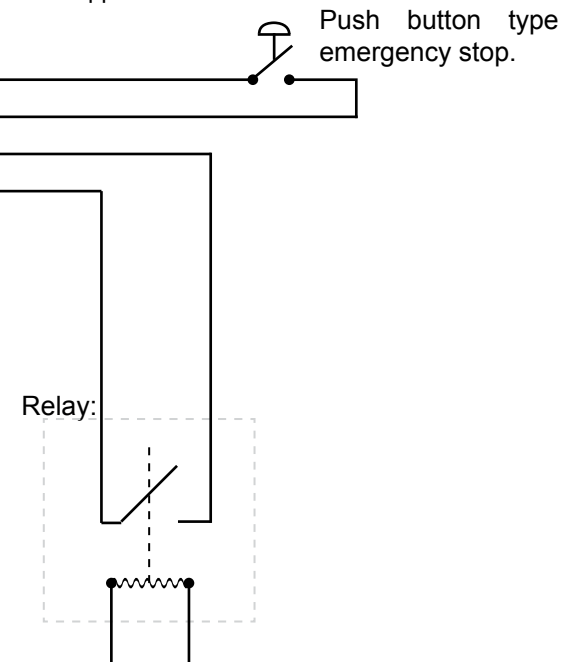
Relay:

If an alarm from the waterpump are going to be used then you need to remove the jumper between 7,8 and replace it with a cable that are conntected to an closing relay. The relaycirquit needs to be closed as long as the waterpump is working.

The input for the waterpump is an security input which means a red light will shine that displays for the occupants to wait and the scoreboard will show "HELP". After the pumpsignal is restored the system will show red and idle for 1,5 minutes before it shows a green light again. During this time the pool should be filled up with water and after 1,5 minutes it should be full again.

*The safety time of 1,5 minutes can be doubled up to 3 minutes by connecting the top left pins according to picture.
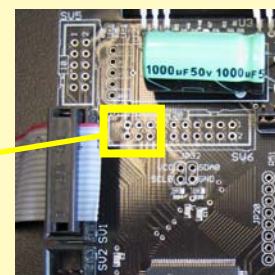
Controlcard Settings

The system program can be configured in different ways. What kind of configuration that is going to be used is selected by a switch on the control card. The control card is located in the main unit.
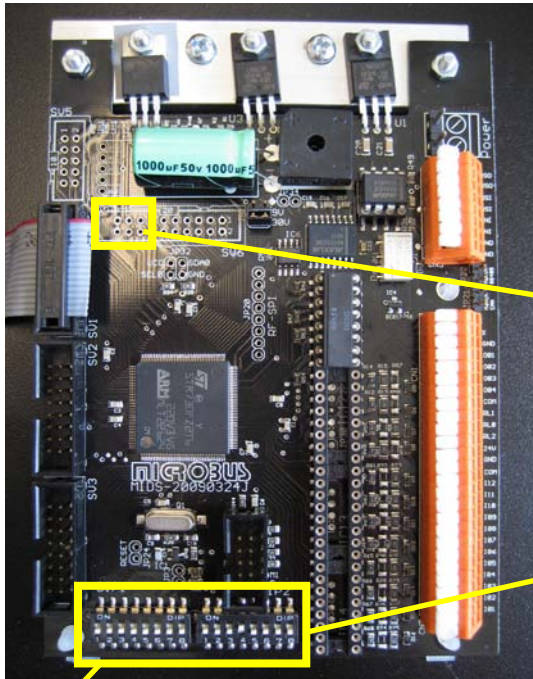
Extra funktionsbyglar.
The top pins if connected doubles the security code for the waterpump signal from 1,5 to 3 minutes. The bottom pins extends the interval time for the reset of the best rides to 7 days.

The control cards switches. The eight switches on the left are called together DIP-Block1 and the ones to the right are called DIP-Block2 (Marked on the card as DIP1 and DIP2)

DIP-Block 1   DIP-Block 2
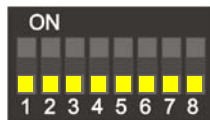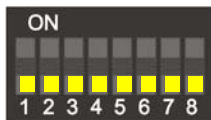
After the installation, start from this and then follow the rest of this manual to set up the display as you want it.

When power is applied to the head unit the following settings will display in the field for "Your ride" The following values are displayed in sequence.

Example:	Description:
3011	(version) The software version of the CPU in the cabinet
___3	(mins) The interval time that the record times is reset in minutes. 3 = 30 min, 144 = 24 h, 1008= 7 days
___5	(secs) The minimum display time for the past ride
__10	(secs) Safety time before it turns to green (sec)
__35	(secs) Timeout / Maximum timekeeping before the clock resets
___4	(secs) Record time limit to prevent cheating (sec)
__90	(secs) The water pumps safety time (sec) (90 or 180)
_130	(m) The tracks length (meters)

Additionally the rides length as well displays in the field for speed.

Error Codes

Other things that can be displayed on the board during operation in normal mode are:
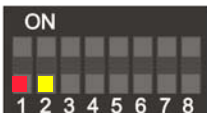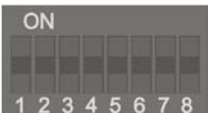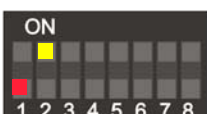
"HELP" = The water pump has problems or has stopped completely, alternative the pump signal is too low or not connected.

"EEE2" = The goal sensor triggers without anybody riding down the slide . Adjust the position, direction and strength on the photocell located at the finish.

Main Modes

DIP-Block 1	DIP-Block 2	Annotation:
		Normal mode (timekeeping with scoreboard)
		Test mode to be used during installation and troubleshooting The display will only show: "H" when the emergency stop signal is high "P" when the water pump signal is high "1" when the photocell beam at the start is broken . Lamp also turns to red. "2" when the photocell beam at the goal is broken.
		Interval function for systems without scoreboards and photocells. For more information see page 10.
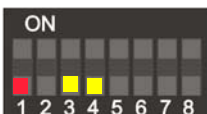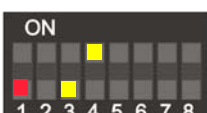
Automatic reset of record

DIP-Block 1	DIP-Block 2	Time:	
		30 minutes. The program resets the record fields every half hour.	
		24 hours. The program resets the record fields once every day	
		If you want a reset every 7 day instead, put a jumper according to the picture.	
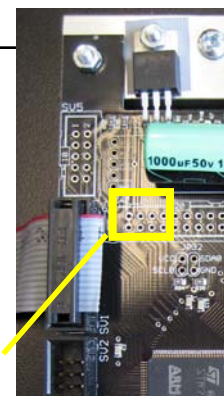
Minimum time view on display

DIP-Block 1	DIP-Block 2	The minimum display time on the latest ride.
		4 seconds
		2 seconds — This makes it possible to adjust the minimum time that the rider is able to see her time on the board, regardless if the next rider have been given the green light and started a new timer.
		3 seconds — Note that it may look like the time on the scoreboard has started late compared to when the rider jumped in the slide. But in fact the timekeeping started exactly the same moment as the beam was broken by the rider. But it just doesn't show up on the scoreboard, yet the calculation of time and speed is precisely right.
		6 seconds

Security: Delay of green light

DIP-Block 1	DIP-Block 2	Extra safety time
		0 seconds
		4 seconds
		8 seconds
		12 seconds

This setting is used to add extra time for the rider to get out of the pool before it turns green for the next rider. This is used to avoid collision between a slower rider that are followed by a faster one. This is very important especially on shorter/faster tracks.

At longer tracks 0 seconds can be used to utilize the water slide and minimize the waiting time.

Security: Minimum interval + timeout

DIP-Block 1	DIP-Block 2	Timeouttid
		The light is red for at least 10 seconds. The lamp automatically turns green again after: 30 seconds (For most tracks)
		The light is red for at least 6 seconds. The lamp automatically turns green again after: 20 seconds (For short tracks)
		The light is red for at least 15 seconds. The lamp automatically turns green again after: 40 seconds (For longer tracks)
		The light is red for at least 20 seconds. The lamp automatically turns green again after: 50 seconds (For longer tracks)

In case of an incorrect triggering of the first sensor without the second sensor is triggered, the timing will return to green after a timeout.

Record Time Limit

DIP-Block 1	DIP-Block 2	Tid:
		4 seconds
		2 seconds

To avoid cheating of unreasonably low times, this timer limits the lowest record time.

The track length of the riders water slide must be specified so the correct speed can be calculated. The seven switches on the DIP-Block 2 indicates how long the track is. The basic track standard is 3 meters and can be extended by using the switches. The switches are valued the following lengths.

dip nr 8 = +1 meters
dip nr 7 = +2 meters
dip nr 6 = +4 meters
dip nr 5 = +8 meters
dip nr 4 = +16 meters
dip nr 3 = +32 meters
dip nr 2 = +64 meters

This provides a minimum track length of 3 meters and maximum track length of 3+1+2+4+8+16+32+64 = 130 meters.

DIP-Block 1	DIP-Block 2	Total track length:
		Example: 3+0 = 3 meters
		Example: 3+8+4+2+1 = 19 meters
		Example: 3+32+16+8+2 = 61 meters
		Example: 3+64+32+8+2+1 = 110 meters

Interval function:

DIP-Block 1	DIP-Block 2	Annotation:

Interval function for systems without scoreboard or photocells.

A smaller system with only pillars of light (without photocells and display) can be used for the green light at regular intervals that gives the start signal for the next rider without any collisions in the water slide. This mode can also be used for example when a photocell has been broken and is waiting to be replaced..

NOTE!
In this mode some of the DIP-switches functions have changed from the previously described in this manual. The pumpsignal function and the emrgency function is still the same as in normal timekeeping mode.
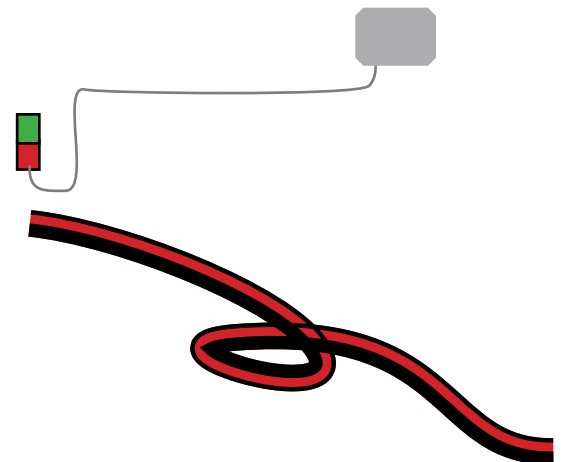
When power is applied to the head unit during this mode the field for "Your ride" will show the following values in sequence:

Example: Description:
_934   The software version in the main unit
__30   The interval time between every run (sec)
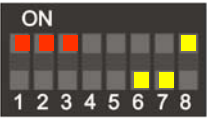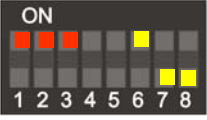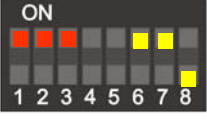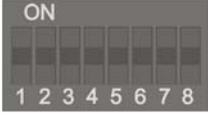___4   The time duration as the lamp shines green.
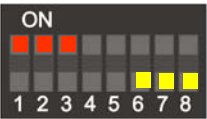
Green light time (interval function only)

The three switches to the right of the DIP-Block 1 determines for how long the green light will be lit (0-4sec) before it turns to red. The minimum time is 0,5 seconds and is calculated using binary code in the switches. Thus as:

dip nr 8 = +0,5 seconds
dip nr 7 = +1 seconds
dip nr 6 = +2 seconds

DIP-Block 1	DIP-Block 2	Duration of green light
		Example: 0,5+0 = 0,5 seconds
		Example: 0,5+0,5 = 1 seconds
		Example: 0,5+2 = 2,5 seconds
		Example: 0,5+2+1 = 3,5 seconds

The green light can, no matter settings never shine more than half the interval time

Time between runs (only with interval function)

The six switches on the DIP-Block 2 determines how long time it goes between each rider/green signal. Minimum time is always 1 second and the time can be extended with the switches that have the following values:
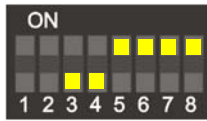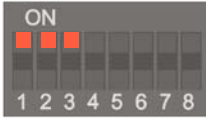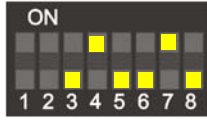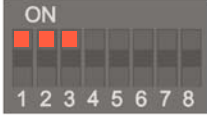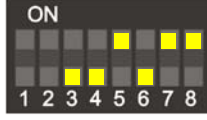
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dip nr 5 = +8 seconds
dip nr 4 = +16 seconds
dip nr 3 = +32 seconds
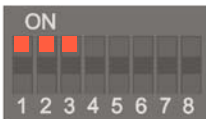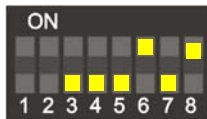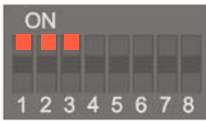
This provides a maximum time interval of 1+1+2+4+8+16+32=64 seconds.

DIP-Block 1	DIP-Block 2	Total interval tid:
		Example: 1+4+1 = 6 seconds
		Example: 1+8+4+2+1 = 16 seconds
		Example: 1+16+2 = 19 seconds
		Exempel: 1+8+2+1 = 12 seconds

Product series MPS-WTxx

MPS-WT2A

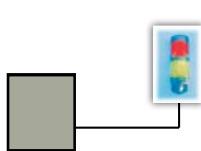Standardsystem with recent track time and best track result.
Character height 2x 77mm
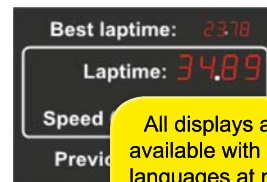
Art.Nr: 30-060-14

MPS-WT2B

System with track speed and top track speed.
Character height 2x 77mm

Art.Nr: 30-060-16

MPS-WT2i

System with light signal but without photocells. The light changes constantly between red and green with adjustable intervals. Photocells and display can be installed later to the system.
Art.Nr: 30-068-10

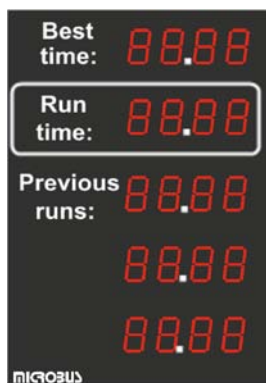All displays are available with other languages at no extra cost.

MPS-WT4A

A combo between track time and track speed, recent track time and top track result. The current ride promoted with larger numbers.
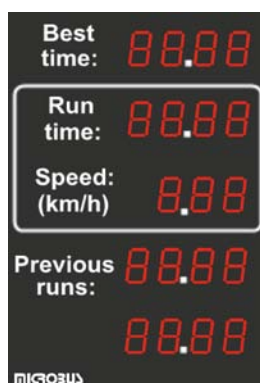Character height: 2x 77mm + 2x 45mm

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MPS-WT5A

System with current track time but also the past three track times.
Character height: 5x 77mm

Art.Nr: 30-062-10

MPS-WT5B

System similar to WT5A, but with a field which shows track speed.
Character height: 5x 77mm

Art.Nr: 30-063-11