



SWARCO TRAFFIC Ltd.

User Manual Your Speed is..
001-009
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Document Control

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1 Introduction

The Your Speed is..(YSI) is used to provide a visible warning to road users approaching the sign. The sign is able to detect oncoming vehicles using its integrated radar detector and the speed of the approaching vehicle is displayed to the driver. Preset speed thresholds can be used to optionally warn the driver to slow down if above the threshold or thank the driver if below the speed threshold. The warning display consists of LED elements combined to display warning messages.

Depending on the required configuration of the sign when ordering, the sign can be supplied with a range of power supply options, from mains to switched mains or solar with backup battery. Using a mobile data connection the sign can also be accessed remotely via the SWARCO in-station software system PGS.



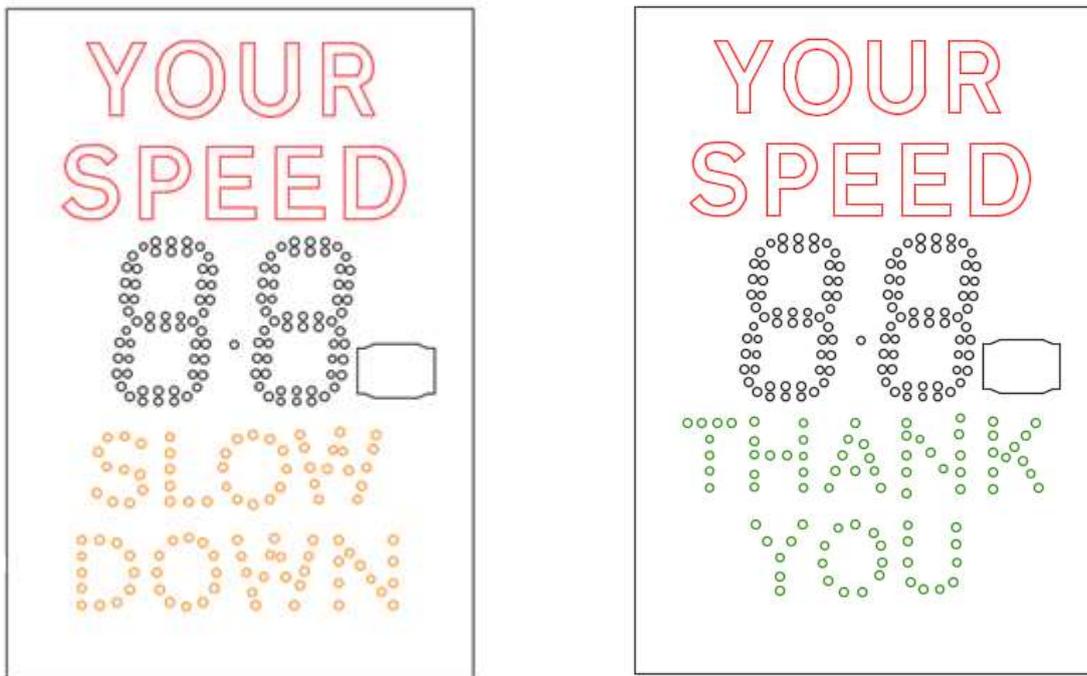
Using the remote connection all statistical analysis is done remotely. If a remote connection is not used then the software files used will allow statistical data to be accessed locally.

2 Description

The YSI consists of the following primary components:

2.1 Chassis

The YSI chassis is constructed from 3mm aluminium which is powder coated (normally black although other colours are available on request). The example below shows a Your Speed warning sign with a supplementary LED text legend. The alternative legends are displayed whether above or below the speed threshold. Alternative legends can also be supported or the speed indication can also be dual colour to indicate above or below the speed threshold. The front face is hinged to allow maintenance access. Once the front face is open, larger signs offer support struts which can be locked to prevent unexpected door closure. Alternative arrangements can be requested.



The chassis is IP55 rated and all cable gland entry points are protected to maintain this rating. Locks are fitted at multiple points to secure the front face of the sign once closed and also to ensure the seal rating is maintained in use.

2.2 Microwave Radar

The radar is the vehicle detector which is integrated within the sign front face. The radar is a 24.2GHz module Doppler detector which detects Doppler shift. As a target approaches the radar some of the signal is reflected back at a shifted frequency and the measured difference between the transmitted and received frequency is proportional to the speed of the approaching vehicle. To save energy the radar module powers up and activates every 200ms to assess the reflected readings and a tracking algorithm then compares these readings to track vehicles in the path of the radar, thus improving accuracy of speed readings.

The normal detection range of the radar is 100m although this is conditional on the radar reflection so a larger vehicle such as a truck may be detected further than 100m away whilst a motorbike or similar small vehicle may be detected at a shorter range.

The radar is normally fitted with firmware and configuration software at manufacture as follows:

001-021 Houston Radar Firmware
001-102 Houston Radar SJV Config File

2.3 Pastros CPU

The Pastros CPU interfaces to the radar module via an RS232 interface. The radar module provides a stream of detection data to the Pastros CPU which in turn is able to provide control of the 7 segment speed displays and operating legends. The Pastros CPU also provide an analogue input for a photocell within the sign enclosure, this allows the LEDs to be PWM to vary the light intensity according to the ambient light conditions.

To allow engineer's access to the Pastros CPU a built-in Bluetooth port is provided to provide engineers access for configuration and monitoring performance.

Power and miscellaneous connections to the Pastros CPU are detailed as follows:

Name	Pin	Comment
12VDC	X1-1	12VDC Supply
0VDC	X1-2	0VDC Supply
12V	X2-1	12V Supply Radar supply
TX	X2-2	Transmit RS232 Radar
RX	X2-3	Receive RS232 Radar
GND	X2-9	0V Supply Radar
LDR+	X6-1	Photocell+
LDR-	X6-2	Photocell-

The sign driver outputs are detailed as follows:

Name	Pin	Comment
48V	X3-1	Segment A Left Digit 48V Supply
Segment A	X3-2	Segment A Left Digit Output
48V	X3-3	Segment B Left Digit 48V Supply
Segment B	X3-4	Segment B Left Digit Output
48V	X3-5	Segment C Left Digit 48V Supply
Segment C	X3-6	Segment C Left Digit Output
48V	X3-7	Segment D Left Digit 48V Supply
Segment D	X3-8	Segment D Left Digit Output
48V	X3-9	Segment E Left Digit 48V Supply
Segment E	X3-10	Segment E Left Digit Output
48V	X3-11	Segment F Left Digit 48V Supply
Segment F	X3-12	Segment F Left Digit Output
48V	X3-13	Segment G Left Digit 48V Supply
Segment G	X3-14	Segment G Left Digit Output

Name	Pin	Comment
48V	X4-1	Segment A Right Digit 48V Supply
Segment A	X4-2	Segment A Right Left Digit Output
48V	X4-3	Segment B Right Digit 48V Supply
Segment B	X4-4	Segment B Right Digit Output
48V	X4-5	Segment C Right Digit 48V Supply
Segment C	X4-6	Segment C Right Digit Output
48V	X4-7	Segment D Right Digit 48V Supply
Segment D	X4-8	Segment D Right Digit Output
48V	X4-9	Segment E Right Digit 48V Supply
Segment E	X4-10	Segment E Right Digit Output
48V	X4-11	Segment F Right Digit 48V Supply
Segment F	X4-12	Segment F Right Digit Output
48V	X4-13	Segment G Left Digit 48V Supply
Segment G	X4-14	Segment G Left Digit Output

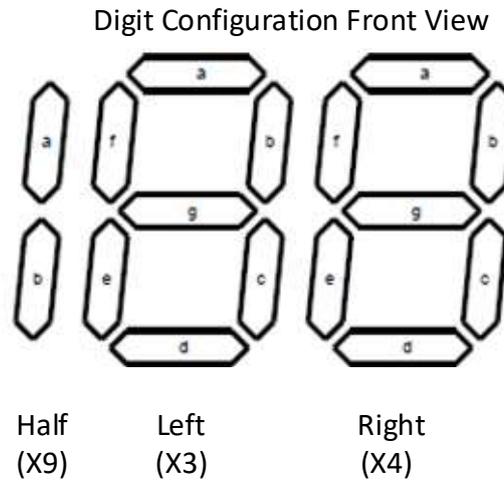
In addition where signs are required to display speeds in km/h instead of mph then an additional digit driver is required as follows:

Name	Pin	Comment
48V	X9-1	Segment A 1XX Digit 48V Supply
Segment A	X9-2	Segment A 1XX Digit Output
48V	X9-3	Segment B 1XX Digit 48V Supply
Segment B	X9-4	Segment B 1XX Digit Output

If optional messages are required in addition to the speed display then these are detailed as follows:

Name	Pin	Comment
48V	X5-1	Warning Message 0VDC
Segment A	X5-2	SLOW DOWN Message Output
48V	X5-3	SPEED LIMIT Output (Not Normally used)
Segment B	X5-4	THANKYOU Message Output
48V	X5-5	Aux Output (Not Normally used)
Segment C	X5-6	Warning Message 48VDC

The layout of the segment displays are as follows:



2.3.1 Pastros CPU Modem (Option)

If your sign is equipped with an optional GPRS modem card then it can be configured to communicate with the SWARCO PGS in-station. The remote connection allows the in-station to configure some of the Pastros CPU control parameters and remotely access statistical data collected by the radar sensor.

2.3.2 Photocell

To allow the sign display to dim the sign drivers using PWM a photocell is connected to the Pastros CPU module on X6/7 between pins 1 and 2. Dimming is used to ensure the sign is efficiently powered to suit the ambient conditions.

2.4 DC DC Inverter

Operating from a single 12VDC supply it is necessary to provide 48VDC for the LED signal emitters. The STL024 converts 10-16VDC to a regulated 48 ± 0.5 VDC at a maximum loading of 48W. The inverter provides reverse polarity and overload protection in case of mishandling or faults. Connections to the module are as follows:

Connection	Function
CONN P1 Pin 1	12VDC Supply input
CONN P1 Pin 2	0VDC
CONN P2 Pin 1	0VDC
CONN P2 Pin 2	48VDC Output

2.5 Power Supply (Mains / Switched Mains/ Solar)

The sign can be powered in the following formats:

- Mains 110/230VAC
- Switched Mains 110/230VAC part time
- Solar

When powered directly from the mains, a high efficiency switch mode power supply is used to convert the 110/230VAC mains supply to a safe 12VDC. Given the variations in design supplied the switch mode supply is adapted to suit the power requirements of the sign.

Switched mains supplies are generally taken from street lighting columns where the mains supply is present during the night and then is removed during the day time. In this case a mains powered battery charger is used during the night time to charge a 12VDC battery. During the sign quotation process the power consumption and the charging time will be used to define the charger and battery required. A low voltage battery disconnect is used to protect the battery from excessive discharge in case of any problems.

Solar requires a solar panel to provide a charging current during the day time and with sun light illuminating the solar panel. This energy is used to charge a 12VDC battery, which then powers the sign. During the sign quotation the power consumption of the sign is estimated together with the geographic location of the sign this is used to estimate the solar power solution for the sign. The solar regulator also provides a low voltage battery disconnect to protect the battery from excessive discharge in case of any problems.

2.6 LED Emitters

When the sign face is triggered it illuminates to display the speed of the approaching vehicle along with a warning message and/or flashing ambers (if specified). Each pixel of the display is formed from an LED and lens. The combination of LED and lens provides optical contrast for the sign and allows the signs to meet standards for optical uniformity and distribution of the light across the road surface.

The LED emitters provide a sign display certified to EN12966 with the following characteristics:

Beam Width	B3
Luminance Ratio	R3
Colour	C2
Luminance	L3

Depending on the ambient light conditions the LED emitters need to be more or less bright, therefore a photocell measures the ambient light conditions on the front face of the sign. The radar module then uses PWM to control the intensity of the LEDs to 6 different light levels. Using this approach also avoids users seeing excessively bright sign displays in low ambient light as well as saving energy where possible.

3 Installation

3.1 Mounting the Sign

During design of the sign, fixing channel sizes and positions will be calculated and integrated into the sign so that when it is mounted on its pole/s it meets the structural requirements of EN12899. It is important to note that in order to meet these requirements the post and more importantly its foundation should also be designed to comply with the requirements of EN12899.

Once the mounting pole has been confirmed as structurally suitable then the sign can be mounted using standard sign fixing clips.

Optimal alignment of the sign is based on the centre of the sign facing the approaching lane at 80-90m.

3.2 Electrical Installation (Mains Only)

Where the equipment is to be installed operating from a 230VAC mains supply to meet safety regulations the equipment should be connected to the mains supply via a suitable electrical cutout. It is recommended the cutout should isolate the live and neutral supplies with a minimum 3mm isolation gap. The electrical cutout should be located in a supply pillar externally located providing access to isolate the mains supply to the sign in case of an accident or for maintenance purposes.

3.3 Radar Alignment

When positioning the sign on the mounting pole it is important to realise that the radar unit is mounted parallel to the front surface of the sign. The sign should be targeted to ensure the radar is aligned to the centre of the approaching traffic at 60-90m along the carriageway. It should be noted that the road from the sign to the 60-90m point needs to be straight. It should be noted that any metallic obstructions in the field of view of the radar may affect the range and accuracy of detection.

3.4 Configuration

The sign will be pre-configured to display the vehicle speed when a vehicle approaches the sign. If warning legends are required to be displayed at different speed thresholds such as SLOW DOWN or THANK YOU then these will need to be configured within the software configuration.

3.5 Testing

Once the sign is installed and configured its operation needs to be verified. Look for vehicles travelling away from the radar with no oncoming traffic and confirm the radar is not triggered. Now with oncoming only traffic confirm the vehicles (cars only) are detected at 70m+ triggering the sign. Please note larger vehicles such as Lorries will be detected at greater distances and motorcycles at shorter distances due to the relative size of the radar reflection.

Up-hill and down-hill locations will also affect the detection range.

4 Connecting to the Pastros CPU

To access the Pastros CPU for configuration, monitoring and collecting data you will need to install the Pastros Windows PC application on your Windows compatible PC.

001-090 YSI Windows Configuration Software Non Statistical Data

001-109 YSI Windows Configuration Software with Statistical Data

Ensure the Windows PC has a Bluetooth adapter present and it is active in discoverable mode.

4.1 Bluetooth Setup

The YSI is fitted with a Bluetooth adapter to provide wireless configuration and monitoring of the sign. The device is capable of a data connection speed of 115,200 baud with a maximum range of 30m. Please note that a laptop or personal computer fitted with a class 1 Bluetooth adapter is required to achieve connection at this range.

Before accessing the YSI sign ensure the Bluetooth on the PC is paired to the Pastros CPU Dongle. Double clicking on Bluetooth icon on the taskbar will bring up the display below:

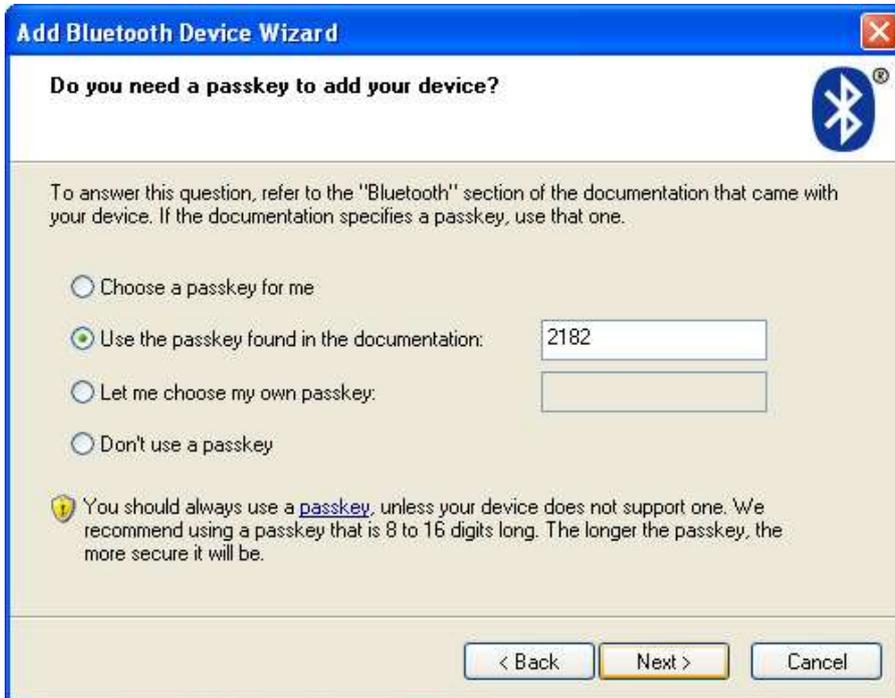


Click Add to add a new device and you should get screen similar to below...



Ensure the `My device is set up and ready to be found` Checkbox is selected, power is applied to the YSI sign and select Next>

The YSI dongle should be displayed in a window as **WT-12** or **WT-11** select the device and then select next, this should bring up the following window:



Select the `Use the passkey found in the documentation` option and enter the passkey **12345678**.

Select Next>

The device should be assigned serial ports by Windows, as illustrated below...



4.2 Pastros CPU Configuration

After establishing the Bluetooth serial port connection, start the PASTROS application on your PC. During the start-up process, the software will attempt to locate the YSI sign. This could take several seconds. After the connection is successfully established, an **OK** message is shown in the status bar.

If the connection cannot be established, go to the **Signboard** menu and choose **Search signboard...** PASTROS will attempt to locate the sign again. If this attempt is also unsuccessful, check your Bluetooth connection.

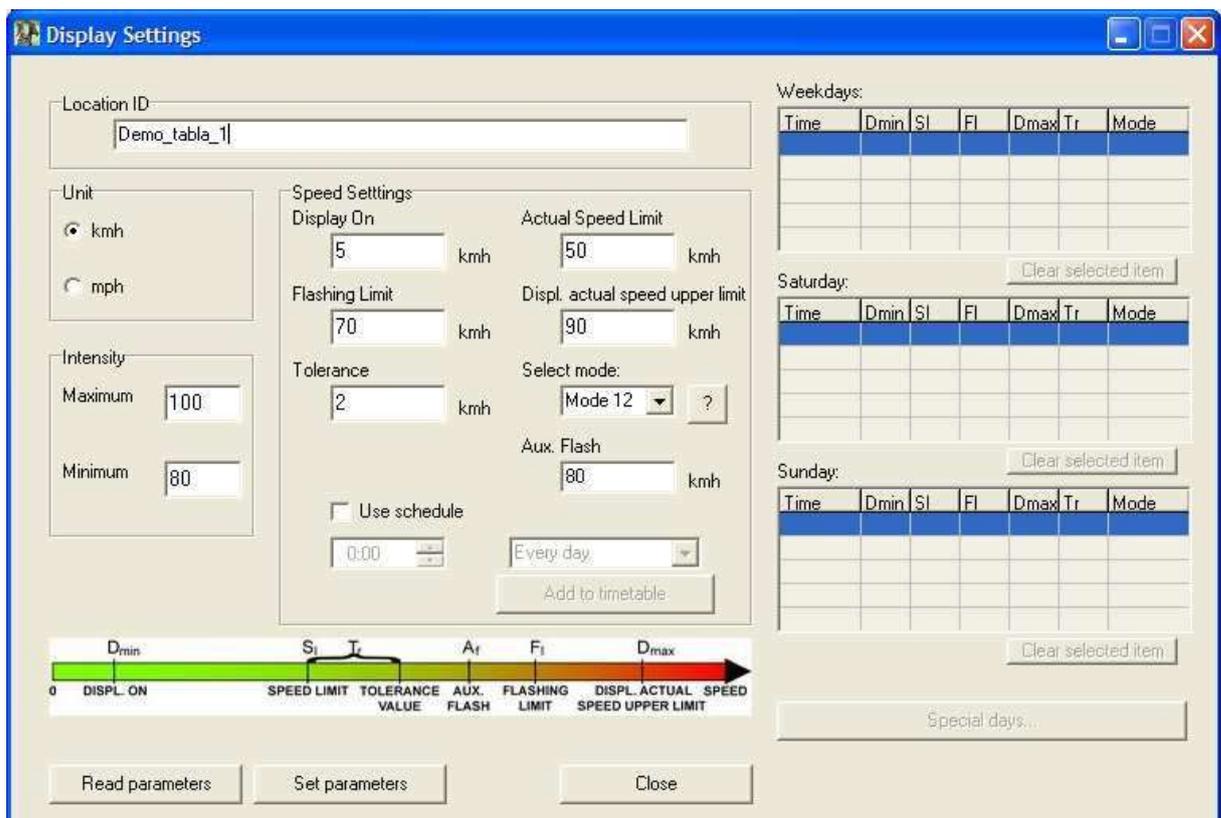
If you know the COM port the Bluetooth connection is using (see Windows Bluetooth devices menu) you can set the serial port in PASTROS manually. Use the **Select serial port...** option of the **Signboard** menu.

4.3 Sign Settings

The following parameters can be adjusted here: display parameters and operation modes, measuring and data recording parameters, Bluetooth name and password, and the device clock.

4.4 Display settings

Set how your YSI sign should react to an approaching vehicle.



4.4.1.1 Display settings

Parameters

Location ID

The name of the sign.

Maximum 30 characters. For example the location and ID of the device can be used here.

Note: Do not use special characters not allowed in filenames. (\backslash :*?<>, etc.)

Starting this field with a space character enables **demo mode**. In demo mode, random speed values are generated as if they would be measured by the radar. This mode is useful for device testing. Actual data from the radar is not displayed or recorded. To turn demo mode off, set a Location ID that does not start with a space character.

Unit

The unit of speed limit parameters (mph or km/h).

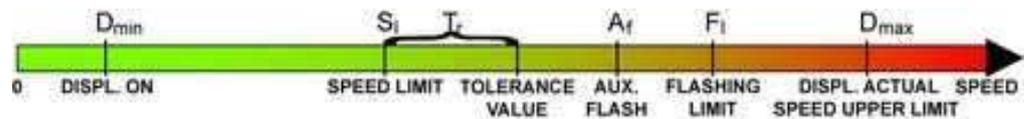
Intensity

The maximum and minimum intensity values of the LEDs in percent.

The maximum value is 100, the minimum value is 0. Automatic dimming works within these limits.

Speed settings

The following speed values must be set:



Remark: There is a minimum speed, below which the radar does not sense vehicles.

Display On (D_{min})	The sign does display a vehicle's speed below this value.
Speed Limit (S_l)	The actual speed limit at the sign's location.
Tolerance value (T_r)	Increases the speed limit with this value. Set it to a 'still acceptable speeding' value.
Flashing Limit (F_l)	Above this speed value the displayed text flashes.
Display actual speed upper limit (D_{max})	To prevent racing, the sign does not display a vehicle's speed over this limit.
Aux. Flash	Above this speed value, the auxiliary flashers are activated (aux. flashers are optional accessories, e.g. amber lights or beacons).
Select mode	Click on the ? button, and you get a list with a wide variety of predefined operating modes. This chart refers to the above mentioned limit values, showing what is displayed by the device in the different modes based on the user defined limit values and on the speed of the approaching vehicle. The first line of the description text is the displayed text (SJT-02V models only), the second line is the displayed speed value . The default mode for UK operation is Mode 16.

	Display without flashing			Flashing display	
	0 to Dmin	Dmin to (SI+Tr)	(SI+Tr) to FI	FI to Dmax	over Dmax
Mode 0	Blank	Blank	Blank	Blank	Blank
Mode 1	Blank	Speed Limit [Speed Limit]	Your Speed [Vehicle Speed]	Blank	Blank
Mode 2	Speed Limit [Speed Limit]	Speed Limit [Speed Limit]	Your Speed [Vehicle Speed]	Slow Down [Speed Limit]	Slow Down [Speed Limit]
Mode 3	Blank	Speed Limit [Speed Limit]	Slow Down [Vehicle Speed]	Slow Down [Speed Limit]	Slow Down [Speed Limit]
Mode 4	Blank	Blank	Slow Down [Vehicle Speed]	Slow Down [Speed Limit]	Slow Down [Speed Limit]
Mode 5	Blank	Blank	Your Speed [Vehicle Speed]	Slow Down [Speed Limit]	Slow Down [Speed Limit]
Mode 6	Blank	Blank	Speed Limit [Speed Limit]	Slow Down [Speed Limit]	Slow Down [Speed Limit]
Mode 7	Blank	Blank	Slow Down [Vehicle Speed]	Slow Down [Vehicle Speed]	Slow Down [Speed Limit]
Mode 8	Blank	Blank	Your Speed [Vehicle Speed]	Your Speed [Vehicle Speed]	Your Speed [Speed Limit]
Mode 9	Blank	Blank	Your Speed [Vehicle Speed]	Slow Down	Slow Down
Mode 10	Blank	Blank	Speed Limit [Speed Limit]	Slow Down	Slow Down
Mode 11	Blank	Blank	Speed Limit [Speed Limit]	Your Speed [Vehicle Speed]	Slow Down
Mode 12	Blank	Your Speed [Vehicle Speed]	Slow Down [Vehicle Speed]	Slow Down [Vehicle Speed]	Speed Limit [Speed Limit]
Mode 13	Blank	Your Speed [Vehicle Speed]	Slow Down [Vehicle Speed]	Slow Down [Vehicle Speed]	Blank
Mode 14	Blank	Your Speed [Vehicle Speed]	Slow Down [Vehicle Speed]	Slow Down [Speed Limit]	Slow Down [Speed Limit]
Mode 15	Blank	Your Speed [Vehicle Speed]	Slow Down [Vehicle Speed]	Slow Down [Vehicle Speed]	Slow Down

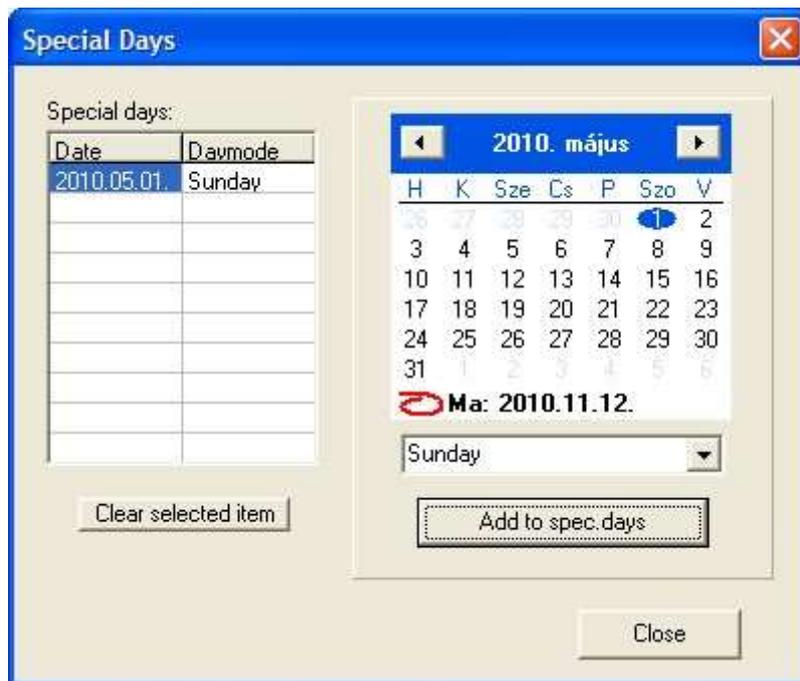
Typical Screen setup for UK operation in 20/30/40/50 mph speed limits are shown below:

4.4.2 Mode selection

Use Schedule

Use time schedule. Set different speed limits for different parts of the day or week. Five different speed limits can be set for each day type (workdays, Saturdays and Sundays). Using a schedule, your YSI sign can be adapted to alternating speed limit requirements as well (school time regulated zones, night time speed reductions, etc.).

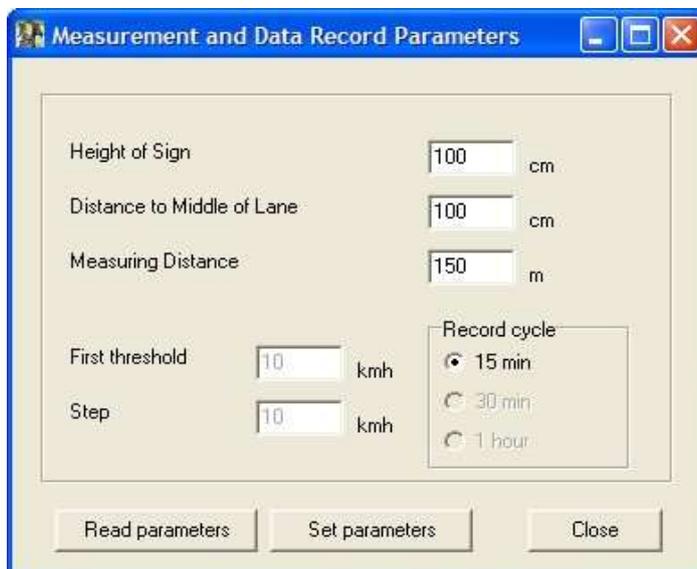
Using the **Special days** button, local holidays can be set.



Remark: Automatic daylight savings time adjustment is firmware dependent. See the **Read device ID** menu for more information.

4.4.3 Measurement and data record parameters

These settings are important for the accuracy of speed measurement.



4.4.3.1 Measurement and data record parameters

The first three lines define the exact physical location of the radar unit. Since the radar makes use of the Doppler Effect, to keep the measured speed values accurate, the speed values need continuous correction depending on the position of the radar. (The radar unit is placed behind the hole near the bottom of the numeric letter at the road side of the display)

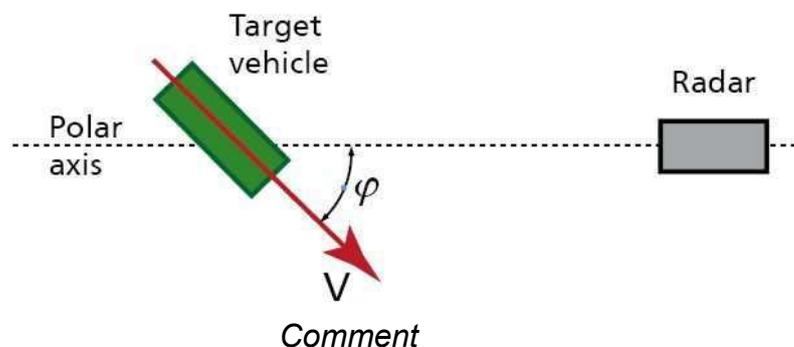
The Doppler shift frequency is the difference between the fundamental transmitted frequency and the received frequency. This is denoted by 'F' and is calculated by:

$$F = \frac{2 * V * F_0}{c} * \cos(\phi)$$

4.4.3.2 Doppler formula

V = Velocity of the target (m/s)

F₀ = Fundamental Frequency (Hz) c = Speed of Light (3*10⁸ m/s) φ = Angle subtended between the radar polar axis and the direction of travel of the target.



There is no Doppler frequency shift signal received by the radar from the target when the target is stationary or if φ = 90°.

The following values must be set:

Height of the sign

The vertical distance of the radar from the surface of the road.

Distance to the middle of the lane

The horizontal distance of the radar from the middle of the observed lane(s).

Measuring distance

The horizontal distance of the radar from the position of the approaching vehicle in the moment of first detection. The YSI sign collects data records for the user. Data records contain the number of passed vehicles classified into 20 speed bins. Furthermore it contains the min, max, average, 85th percentile speeds and the actual speed limit of the time interval.

Record cycle

The time interval of the data records is 15 minutes. If your traffic demand does not exceed 65 535 vehicles per interval (which is almost impossible on one lane), you can expect a recording capacity of 15 days. After 15 days, the oldest data is overwritten.

First threshold

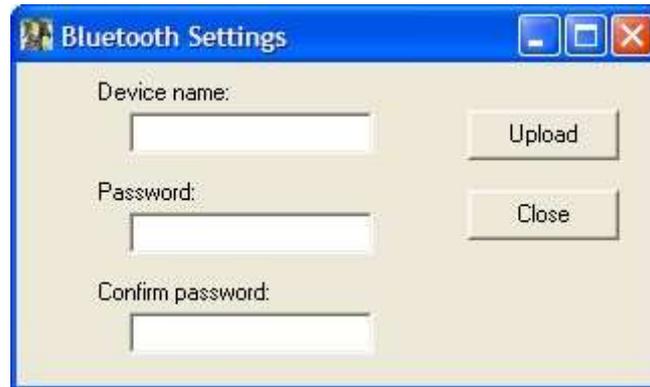
Speed value of the first speed bin. 10 km/h or 5 mph depending on the unit set.

Step

Speed step between the next 19 bins. 10 km/h or 5 mph depending on the unit set.

To transfer the chosen settings to the sign, use the 'Set parameters' button.

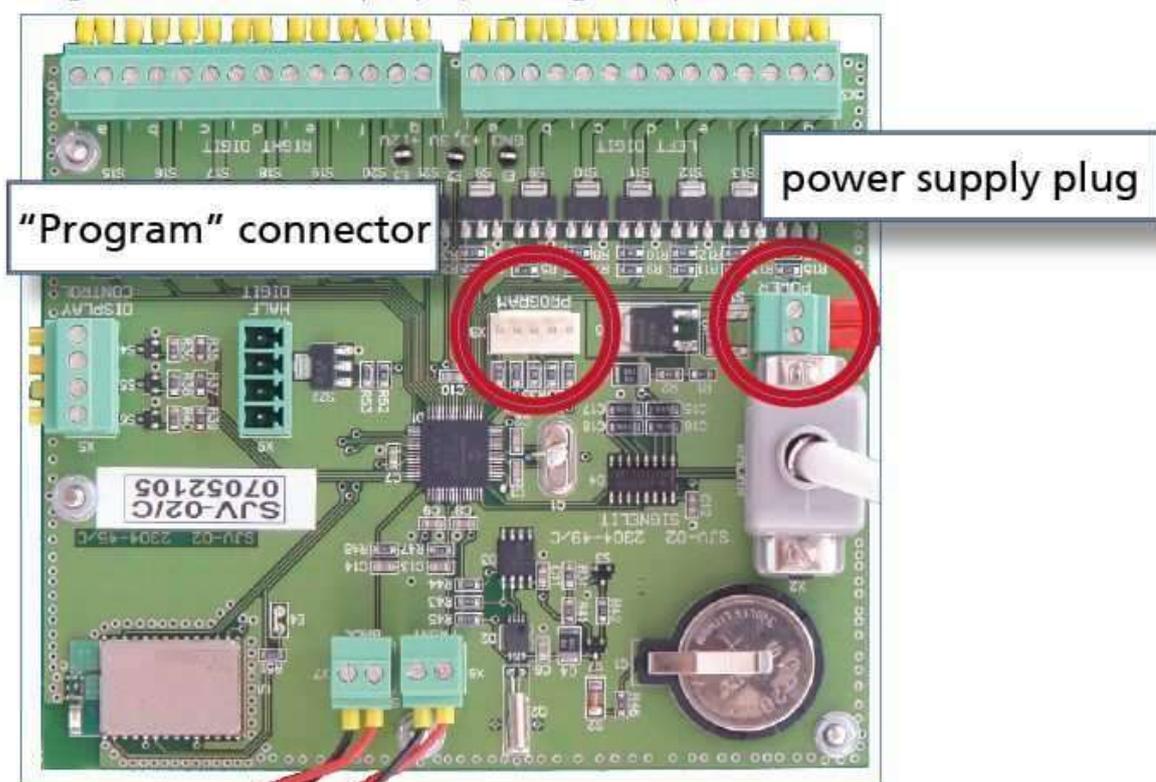
4.4.4 Bluetooth Settings



4.4.4.1 Bluetooth settings

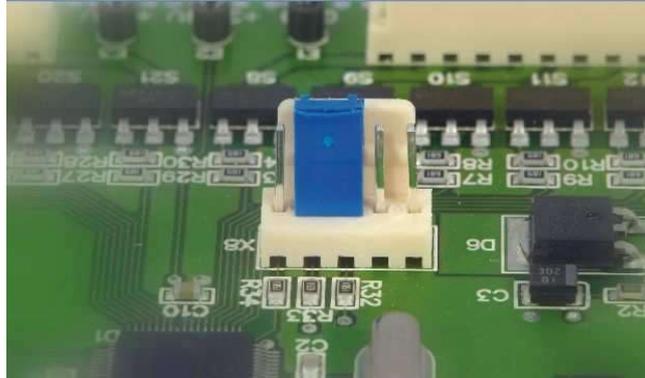
In this submenu, Bluetooth parameters such as the YSI sign's Bluetooth name and the pairing password can be changed. These are required to set up a Bluetooth connection in Windows. For safety reasons, you should change these parameters according to the security policy of your organization.

If you had forgotten the Bluetooth password, you can reset the factory settings. Open the sign and disconnect the power supply plug on the controller board, then find the Program connector (X8). (See below)



4.4.4.2 The Pastros CPU electronic board

Short the 2nd and 3rd pins of the Program connector (X8) with a jumper. (See below)



4.4.4.3 Jumper on the Program connector

Reconnect the power supply plug and wait several seconds. Remove the power supply plug again, take off the jumper. Reconnect the power supply plug and close the sign door.

The Bluetooth name and password is now reset to factory settings.

Name: BT-12 or BT-11

Password: 12345678

4.4.5 Clock settings



The date and time can be adjusted in this submenu.

The first line shows the PC's clock, the second line is the actual time read out from the device. You can sync the clock of the device with the PC's, or set the time manually.

4.4.6 Auto time sync

PASTROS automatically syncs the device's clock with the PC's after successfully connecting to a display device.

4.4.7 Auto port search

PASTROS can automatically search for a speed sign on all available Bluetooth serial ports.

When disabled, PASTROS uses the last port on which it has found a speed sign. If you usually use a fixed port, disable this option after PASTROS finds your sign, so next time you start PASTROS, the same Bluetooth port is used.

4.5 Modem settings (Optional)

If your sign is equipped with an optional GPRS modem card then it can be configured to communicate with the SWARCO PGS in-station. The remote connection allows the in-station to configure some of the Pastros CPU control parameters and remotely access statistical data collected by the radar sensor.

The modem and connection parameters are set here:

APN

APN for an internet connection (ask your mobile provider for the correct setting)

Username

Username for an internet connection (optional, ask your mobile provider for the correct setting)

Password

Password for an internet connection (optional, ask your mobile provider for the correct setting)

IP address or host

Address of the DFS Remote server (default: dfsremote.com)

Port number

Port number of the DFS Remote server (default: 7856)

PIN

If the SIM is set to ask for a PIN, enter it here. Please note, that if you enter an incorrect PIN, the modem only validates it once to avoid blocking the SIM. To revalidate, enter a different PIN.

Status

GPRS modem card status. If the modem card indicates an error, check the connection parameters.

Modem firmware

GPRS modem card firmware version.

4.6 Download Data (Optional)

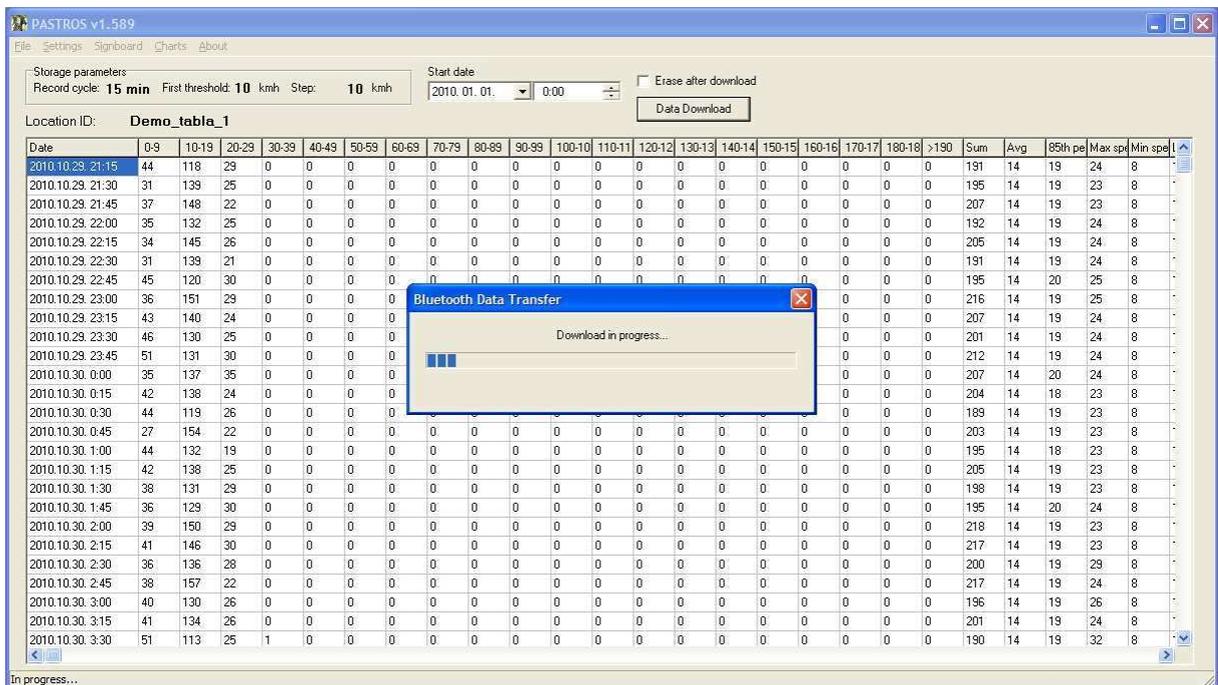
Data download is available on sites without a remote GPRS connection, in this case 6 months of data can be stored on site and accessed via the Bluetooth wireless connection.

It is important to consider the software for the Pastros CPU and Windows Configuration tool both have variants for Statistical collection (local access to sign) and non statistical collection (remote access to the sign).

With a click of a mouse, the collected traffic data from your YSI sign is downloaded to your computer. If you want to download the collected data only from a certain date and time, change the date in the **Start date** control to an appropriate value.

To start the download process, click the **Data Download** button.

If the **Erase after download** checkbox is marked, all collected traffic data is erased after a successful data download process.



The screenshot shows the PASTROS v1.589 software interface. The main window displays a table of traffic data for location 'Demo_table_1'. The table has columns for Date, time intervals (0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-89, 90-99, 100-109, 110-119, 120-129, 130-139, 140-149, 150-159, 160-169, 170-179, 180-189, >190), and summary statistics (Sum, Avg, 85th pe, Max spd, Min spd). A 'Bluetooth Data Transfer' dialog box is overlaid on the table, showing 'Download in progress...' with a progress bar.

Date	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	>190	Sum	Avg	85th pe	Max spd	Min spd
2010.10.29. 21:15	44	118	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	191	14	19	24	8
2010.10.29. 21:30	31	139	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	14	19	23	8
2010.10.29. 21:45	37	149	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	207	14	19	23	8
2010.10.29. 22:00	35	132	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	192	14	19	24	8
2010.10.29. 22:15	34	145	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205	14	19	24	8
2010.10.29. 22:30	31	139	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	191	14	19	24	8
2010.10.29. 22:45	45	120	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	14	20	25	8
2010.10.29. 23:00	36	151	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	216	14	19	25	8
2010.10.29. 23:15	43	140	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	207	14	19	24	8
2010.10.29. 23:30	46	130	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	201	14	19	24	8
2010.10.29. 23:45	51	131	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	14	19	24	8
2010.10.30. 0:00	35	137	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	207	14	20	24	8
2010.10.30. 0:15	42	138	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204	14	18	23	8
2010.10.30. 0:30	44	119	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	189	14	19	23	8
2010.10.30. 0:45	27	154	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	203	14	19	23	8
2010.10.30. 1:00	44	132	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	14	18	23	8
2010.10.30. 1:15	42	138	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205	14	19	23	8
2010.10.30. 1:30	38	131	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198	14	19	23	8
2010.10.30. 1:45	36	129	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	14	20	24	8
2010.10.30. 2:00	39	150	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	218	14	19	23	8
2010.10.30. 2:15	41	146	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	217	14	19	23	8
2010.10.30. 2:30	36	136	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	14	19	29	8
2010.10.30. 2:45	38	157	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	217	14	19	24	8
2010.10.30. 3:00	40	130	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	196	14	19	26	8
2010.10.30. 3:15	41	134	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	201	14	19	24	8
2010.10.30. 3:30	51	113	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190	14	19	32	8

Data download

The downloaded data shows the vehicle counters by speed class in 15 minute steps along with the average, minimum, maximum and 85th percentile speed values. The actual speed limit is also shown. The downloaded data also contains the time of a device restart (For example after a voltage break).

4.7 Other Menus

4.7.1 File

In this menu you can manage your downloaded or earlier saved traffic data.

4.7.2 Export data to Excel

Exports the downloaded traffic data to a Microsoft Excel spreadsheet. The header data is displayed in the first four rows with each coming row displaying one data record.

4.7.3 Save data as text

After the data is downloaded successfully, you can save it as a CSV text file. To do this, select **Save data as text...** from the **File** menu.

The file is saved in the following format: In the header, the location and storage parameters are displayed. After the header each row contains the data of a measured period. The values are separated by comma.

If you want to add data to an existing file, choose an existing filename and the new records will be appended to the end of the existing file. The headers must be identical for the merge to be accurate. The software will not check the header of the original document before merging the new data.

4.7.4 Exit

Exit PASTROS.

4.7.5 Signboard

In this menu you can erase the YSI sign's memory, read out the factory serial number, and update the firmware.

4.7.6 Erase device memory

All collected traffic data from the speed sign can be erased using the **Erase device memory** submenu.

The following message box opens to confirm this command.



Confirmation of device memory erase

4.7.7 Read device ID

The **Read device ID** submenu displays the Factory ID (Controller Name), firmware version, radar type, radar input unit and time zone setting of your sign. This is for information purposes only and cannot be changed.

4.7.8 Search signboard

Search for a sign again, or re-establish the connection with a sign after a firmware update.

4.7.9 Select serial port

Select the serial port of the Bluetooth connection manually.

4.7.10 Bluetooth reset

In some cases you have to reset the Bluetooth device of the sign's controller card. Click on this menu to reset the sign's Bluetooth device.

4.7.11 Memory map

Specific firmware versions support reading out and saving the memory content of the controller card. This menu option is for support purposes.

4.7.12 Firmware update

With this function you can update the firmware running in your YSI sign. Before starting the update process, please make sure you have both the current and the new firmware version on your computer.

Do not use resource-intensive applications while updating the firmware, or else the process might interrupt.

The collected traffic data and the settings are not affected by the update. If the update is for some reason unsuccessful, select **Search sign...** or **Select serial port...** from the menu. The sign will ask for a firmware after establishing the Bluetooth connection.

Firmware files used are as follows:

001-092 Pastros Controller Firmware Houston Non Stats
001-109 Pastros Controller Firmware Houston with Stats

The naming of the firmware .bin files are the following:

5125_ShKWR.bin

5125: Firmware version or name (e.g. 5125 or S7C) **S:**

Firmware type (S = YSI, H = StatPack)

a: Radar communication protocol (a = AGD, h, d = SI3)

K: Radar unit (K = kmh, M = mph)

U: Automatic DST change (W = Western European Time (GMT), E = EU/Central European Time (GMT+1), N = Eastern European Time (GMT+2), U = North America, N = none)

R: Firmware subversion (R = release, other = non-release version)

(optional) additional characters: special versions

4.7.13 Charts

Basic visualization of downloaded traffic data. Please note that your PASTROS window should not be in full screen mode while you use this features.

4.7.14 Lines

With this feature you can visualize the counters of the speed classes of a time interval. You can zoom in by selecting a part of the chart.

4.7.15 Characteristic speed values

Choosing this option the maximum, minimum, average and 85th percentile speeds of the collected traffic data are shown. The checkboxes switch speed value types on and off.

4.7.16 Factory Settings

4.7.17 Reset to factory settings

Set all display, measurement and data record parameters to sane default values. Only use if instructed to by technical support personnel.

After resetting values, check and change the parameters as necessary.

5 Specifications

Operating conditions:

Temperature -15 to +60C
 IP Rating: IP55
 Supply Voltage 230VAC / 12VDC

Radar:

Fundamental Frequency 24.2GHz (K Band)
 Beam Angle 38° * 45°
 Beam Polarisation Linear
 RF Power 5mW
 Maximum Detection Range 100m

CE Certification

EN12966 Road Vertical Signs – Variable Message Signs

Uniformity: Pass

Requirement	White	Red	Yellow	Blue	Green
Colour	C2	C2	C2	C2	C2
Luminance	L3	L3	L3	L3	L3
Luminance Ratio	R3	R3	R3	R3	R3
Beam Width	B3	B3	B3	B3	B3

Protection: P2
 Temperature: T1
 Dynamic Snow Pressure: DSL4
 Point Load: PL3
 Wind Loading: WL7
 Temporary Deflection Bending: TDB5
 Partial Action Factor:PAF1

EN50293 Electromagnetic Compatibility
 EN50556 Road Traffic Signal Systems - Electrical Safety

