

# Portable Traffic Lights



## Product Manual

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### Switching the Master and Slave Controllers On

Both the Master and Slave Controllers are fitted with an ON/OFF key-switch for security reasons. Insert the key and turn the key-switch on the Controller to the ON position. The POWER light will come on and the Controller will start up and begin the initialisation phase. Both the Master and Slave will show Flashing Yellow while the Controller initialises.



The LCD panel on the Master Controller will show the progress of the initialisation (startup) phase. The Master and the Slave(s) units will begin to establish a radio link during initialisation. For more information regarding the radio link, see the Radio Link Explained section below.

The Master and Slave Controllers will complete a self-diagnosis and check any connected external equipment such as the optional vehicle detector unit. The status of the external equipment will be displayed on the LCD panel on the Master Controller. The vehicle detector unit will only be checked if the Master is set to Demand mode. If a Remote is connected via the wireless link, the **REMOTE ACTIVE** light will be lit on the Master and Slave Controllers.

Either Shuttle or Plant-Crossing Control is selected with the second key-switch. The Master Controller will start up in the last selected Mode. If **PROGRAM** is selected with the second key-switch, the Master Controller will wait for further input; see the Program Mode section below.

## Master Controller: Program Mode key-switch

Buttons used:

- > MENU
- > Up (↑) and Down (↓) Arrow
- > MODE SELECT buttons: YELLOW FLASH, AUTO (TIMED), DEMAND, MANUAL
- > RED TIME SET, YELLOW TIME SET, GREEN TIME SET
- > Numeric Keypad
- > ENTER

Select **PROGRAM** Mode position on the left key-switch on the Master Controller to enable the required **MODE SELECT** and also to set the Red, Yellow, Green times and other programmable functions. Note: The key cannot be removed from the key-switch when in **PROGRAM** Mode.

If **PROGRAM** Mode is selected from the key-switch before the Master key-switch is turned ON, the Master Controller will enter the PROGRAM MODE immediately on power up. If **PROGRAM** Mode is selected from the key-switch while the Master unit is on, any ALL-RED Time will be completed before PROGRAM MODE is entered. The Master and Slave units will enter Flashing Yellow mode when Program Mode is entered. The following screen will be displayed on the LCD panel.

P	R	O	G	R	A	M		M	O	D	E		[	A	U	T	O	]
*		S	E	T		A	U	T	O		R	E	T	U	R	N	?	
		A	S	P	E	C	T	S		I	N	H	I	B	I	T		
		T	I	M	E		D	I	S	P	L	A	Y		M	O	D	E

Press any of the four **MODE SELECT** buttons to select the mode you want to use, this is shown on the top line in between [ ] brackets as per above LCD screen

- > **YELLOW FLASH** is Flashing Yellow mode of operation.
- > **AUTO (TIMED)** is Auto(Timed) mode of operation. Most commonly used.
- > **DEMAND** is Vehicle-actuated mode of operation.
- > **MANUAL** is Manual mode of operation.

All operational parameters are stored on the Memory (SD) card fitted to the Master Controller. Turn the key-switch to either Shuttle or Plant-Crossing to save the changes you made in **PROGRAM** Mode.

Use the keyboard buttons to set phase times. For example, press the **RED TIME SET** button to set the All- Red time. All time values are in seconds. Enter a new value using the keypad. The currently set time value is shown as the current value on each set time screen. The Minimum Green time is fixed at 10 seconds and cannot be changed.<sup>1</sup>

The function of each MENU item and associated buttons is explained further below.

<sup>1</sup> See Section 2.7.3 of AS 4191-1994.

## SET ALL-RED TIME

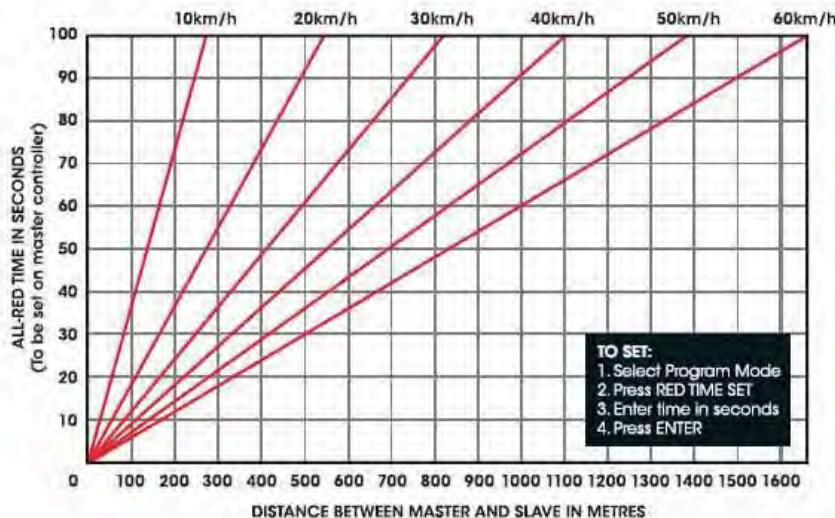
Default time: 30 seconds



The All-Red interval is the period of time that the aspects on both the Master and Slave units remain on the Red phase simultaneously. This allows for the clearance of traffic within the controlled area.

### RELATIONSHIP BETWEEN ALL-RED INTERVAL AND TRAVEL DISTANCE FOR A RANGE OF VEHICLE SPEEDS

AS 4191-1994



#### ENSURE ALL-RED TIME IS CORRECTLY SET

The information in this diagram is provided to assist in a determination of the minimum all-red interval necessary for a vehicle to clear the controlled area. The vehicle speed lines indicate the minimum observed speed for a given direction.

When using the diagram, it is important to note that the maximum length of the controlled area (distance between master and slave) must be separately determined having due regard to:

- (a) total delays to queued traffic, and
- (b) restrictions imposed by the quality of the communications link

View user manual for more information.

The chart above is also provided in the Control box on the Master unit. Use this chart to determine the minimum All-Red interval to set depending on the distance between the Master and the Slave unit, and the set speed zone.

**SET GREEN MAX TIME** - Press the **GREEN TIME SET** button once within 1 second

Default: 50 seconds



The Maximum Green time is the maximum time period at which an aspect on the Master or the Slave units can be held on the Green signal phase. This time is used as the Green signal phase time for Auto (Timed) mode.

A sub-menu is displayed on the LCD on the Master Controller. You can set the maximum Green time for ALL the units currently being used, or you can select to set the maximum Green time for a specific unit. For example, while running in 3-WAY CONTROL, Auto(Timed) mode, a different Green time can be specified for each unit using this menu.

**SET GREEN Ext. TIME** - Press the **GREEN TIME SET** button twice within 1 second

Default: 5 seconds



The Green Extension time is the interval of Green phase that will be extended on each occurrence of vehicle detection (an actuation) while the Green phase is active.

For example: PTL are running in Shuttle Control, Demand (Vehicle Actuated) mode. The Slave is currently on the Red signal phase. A vehicle is detected on the Slave. The Slave will then change to the Green signal phase. The Green extension time applies if additional vehicles are detected on the Slave while it is on the Green signal phase.



### SET YELLOW TIME

Default: 4 seconds



The Yellow time is the time at which the aspect on the Master or Slave units is held on the Yellow signal when moving from Green to Red phase. Select 4 or 5 seconds and then press the **ENTER** button.

### **MENU** button – For Custom Setup Options



When the MENU button (top/left) is pressed, the **PROGRAM** Mode main menu re-appears. Use the [↑] and [↓] arrow buttons to navigate forward and back through the menu.

#### Menu Item: Set Auto Return?

This option should not be used in NSW. Check your state or territory guidelines for more information. Use this menu item to set Auto Return to ON or OFF. Auto Return ONLY applies to Plant Crossing Control, Manual mode. This is explained in the Plant Crossing Control section below.

#### Menu Item: ASPECTS INHIBIT

This menu item is used primarily for testing. If required, the Controllers on the Master and Slave units can operate without activating any aspects. Select either Normal Operation (default) or Disable Aspects from this menu by selecting and pressing the **ENTER** button.

#### Menu Item: TIME DISPLAY MODE

The time display refers to the All-Red and Green time displayed on the LCD panel of the Master Controller during normal operation. You can choose to view the time in seconds, or minutes and seconds. Select either option from this menu by pressing the **ENTER** button.

#### Menu Item: BEACON ON/OFF

The Beacon lamp located on the back of the aspects can be disabled. Turning the Beacon lamp off will help conserve battery power.

#### Menu Item: LCD LIGHT ON/OFF

The LCD is fitted with a backlight so it is easier to read in low light conditions. This can be turned off. Default is ON.

#### Menu Item: VIEW FAULT LOG

Select the View Fault Log menu item to scroll through the fault log file. More information regarding the fault log file is provided in the Fault Conditions section below.

### **Menu Item: ERASE FAULT LOG**

Selecting this menu item deletes the fault log file that is stored on the SD memory card.

### **Menu Item: SET FACTORY DEFLT (DEFAULTS)**

To set each time setting back to the default value, select the Set Factory Defaults menu item. Press the **ENTER** button to confirm that you want to set default values;  
All-Red – 30 secs, Yellow – 4 secs, Green-Extension – 5 secs, Max-Green – 50 secs.

### **Menu Item: VMS INTEGRATION**

Use this option to turn enable or disable VMS Integration. If you select ENABLE, you will be prompted for the SMS Numbers of the VMS the PTL's should interact with. More information about this functionality is provided in the 3G/GPS Functionality section below.

### **Menu Item: SMS FAULT ALERT**

Within this menu item, set up to two SMS numbers of mobile numbers to be sent an SMS to when the PTL set is in Flashing Yellow mode after a fault has occurred. The interval between when the fault SMS messages are sent can be changed. Disable or enable this function from within this menu also. More information about this functionality is provided in the 3G/GPS Functionality section below.

### **Menu Item: TIMEOUT INTERVAL**

The RF communications timeout is set to 5 seconds by default and according to the Australian Standard. However, in areas with high RF interference the timeout period can be increased. This may also be useful when two PTL sets are operating together in Intersection mode.

### **Menu Item: AUXILIARY ON/OFF**

If auxiliary aspects are fitted, use this menu item to turn the output to the auxiliary aspects on or off.

### **Menu Item: MASTER SETTING**

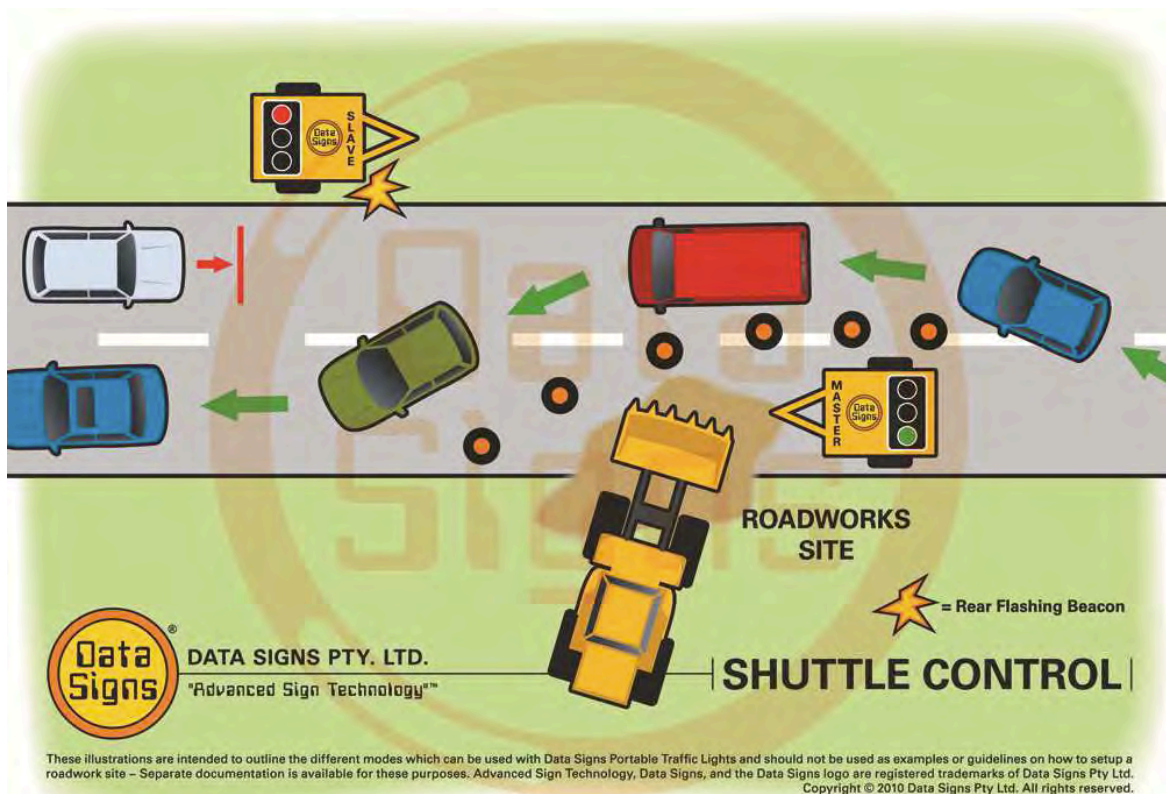
Use this menu item to set the RF channel, RF power mode, type of Control on the Master Controller. See the Master/Slave Controller Configuration section of this manual for more information.

### **Menu Item: SLAVE SETTING**

Use this menu item to set the RF channel, RF power mode, type of Control for Slave that is paired with this Master PTL unit. The SD card is used to move the settings to the Slave. See the Master/Slave Controller Configuration section of this manual for more information.

## Shuttle Control – Single-Lane Usage

Shuttle Control is a form of traffic control used where a portion of the roadway is closed so that only a single lane can be used alternatively by traffic from opposite directions. Only one Portable Traffic Light unit can show the Green signal phase at any time; either the Master or the Slave. The diagram below illustrates the traffic control scenario where Shuttle control would typically be used. Note: This diagram should not be used as a guideline for setting up a roadwork site, it is only provided as an example.



Shuttle Control is active while the left key-switch on the Master Controller is in the **SHUTTLE** position. Turn the key-switch to **PROGRAM** Mode to change between various operational modes. Each operating mode is described in more detail below.

For Shuttle control, during normal operation, the LCD panel will display the following:

1	2	.	1	V		L	I	N	K		O	K		1	2	.	1	V
				M	A	N	U	A	L		M	O	D	E				
A	L	L		R	E	D								G	R	E	E	N
1	1	0		S	e	c					0	5	6		S	e	c	

First line: Master Battery Voltage, Radio Link status, Slave Battery Voltage.  
 The first line may also show 3G/GPS: OK if a SIM card has been fitted to the optional 3G/GPS module. Second line: Current Mode in use  
 Third and Fourth line: Master Remaining Red time, Master Remaining Green time.



### Shuttle: Yellow Flash mode

No buttons are active for this mode on the Master or Remote Control.



The Flashing Yellow mode operates in response to specific fault conditions and it can also be manually selected. During Flashing Yellow mode, all aspects controlled by the Master - and the Master itself - will flash the Yellow signal at a flash rate of sixty flashes per minute.

### Shuttle: Auto (Timed) mode

No buttons are active for this mode on the Master or Remote Control.

In Auto(Timed) mode, the Portable Traffic Lights will operate in cyclic order according to the preset times. These times are set using the **PROGRAM** Mode key-switch, discussed previously.

To set the All-Red interval, refer to the “RELATIONSHIP BETWEEN ALL-RED INTERVAL AND TRAVEL DISTANCE FOR A RANGE OF VEHICLE SPEEDS” chart provided in the Control box on the Master unit, and in this document. It is extremely important that the All-Red interval is set correctly for each traffic control situation.

The preset Maximum Green Time is used as the Green signal phase time in Auto (Timed) mode. The time that either the Red or Green signal phase is active until the preset time expires, is displayed on the LCD panel on the Master Controller and the Remote (if attached).

### Shuttle: Demand (Vehicle-Actuated) mode

For Demand mode to operate, a vehicle detector must be fitted to each Portable Traffic Light unit. A “NO VEHICLE DETECTOR” message will appear on the Master Controller LCD if no vehicle detector is attached.

The vehicle detector is preset to detect and create a DEMAND signal when vehicles approach the Portable Traffic Light at speeds between 10 km/h and 80 km/h.<sup>2</sup>

For Shuttle Control, the Master and Slave will rest on the All-Red signal phase until a vehicle is detected on either the Master or Slave, at which point the signal will change to Green signal phase for that unit. During this time, if a vehicle is detected on the opposite unit, the DEMAND LED will flash on the Master, Slave Controller and Remote Control to indicate a DEMAND has been registered. Once this demand is processed, the DEMAND LED will go out.

If a unit is showing the Green signal and during this time another vehicle is detected by the unit, the Green time (or, time to remain on Green) will be extended by the preset Green-Extension time. However, the Green time will only be extended to the Maximum-Green time.

An artificial demand can also be generated using either the STOP or GO button on the Master Controller or Remote Control. If no demand is received from the vehicle detectors during any 3-minute period, an artificial demand will be automatically generated on both the Master and Slave PTL's.

<sup>2</sup> Section 5.3 of AS 4191-1994

### Shuttle: Manual mode

Buttons used:

- > MASTER: STOP, GO
- > REMOTE: STOP, GO

Manual mode is used when an operator wants to control the traffic; a demand for Green or Red signal phase on the Master or Slave is entered on either the Master Controller or Remote Control unit. For Shuttle Control, on startup, both the Master and Slave will rest on All-Red phase until a demand for Green phase is entered.



To enter a demand for either Red or Green phase, press the STOP or GO buttons on either the Master Controller or Remote Control. The DEMAND LED is activated indicating a demand for either the Master or Slave.

### Shuttle Control, Manual mode example:

1. Slave unit is currently showing the Green signal phase.
2. MASTER, **GO** button is pressed (on either Master or Remote Control).
3. If the Minimum Green time (10 seconds) has expired, the Slave will cycle immediately to Yellow and then Red signal phase. If the Minimum Green time has not expired, the Master DEMAND LED will flash.
4. Once the Minimum Green time has expired, the Master DEMAND LED will extinguish and the Slave will cycle to Yellow and then Red.
5. Both Master and Slave now show Red signal phase for the preset All-Red interval.
6. The Master then cycles to Green and remains on Green until a Slave, GO or a Master, STOP button is pressed, and then the sequence is repeated.

Therefore, the All-Red and Minimum Green time apply.

In Manual mode the signal phases can remain indefinitely on Green/Red, Red/Green or All-Red.

## 3-Way Shuttle Control

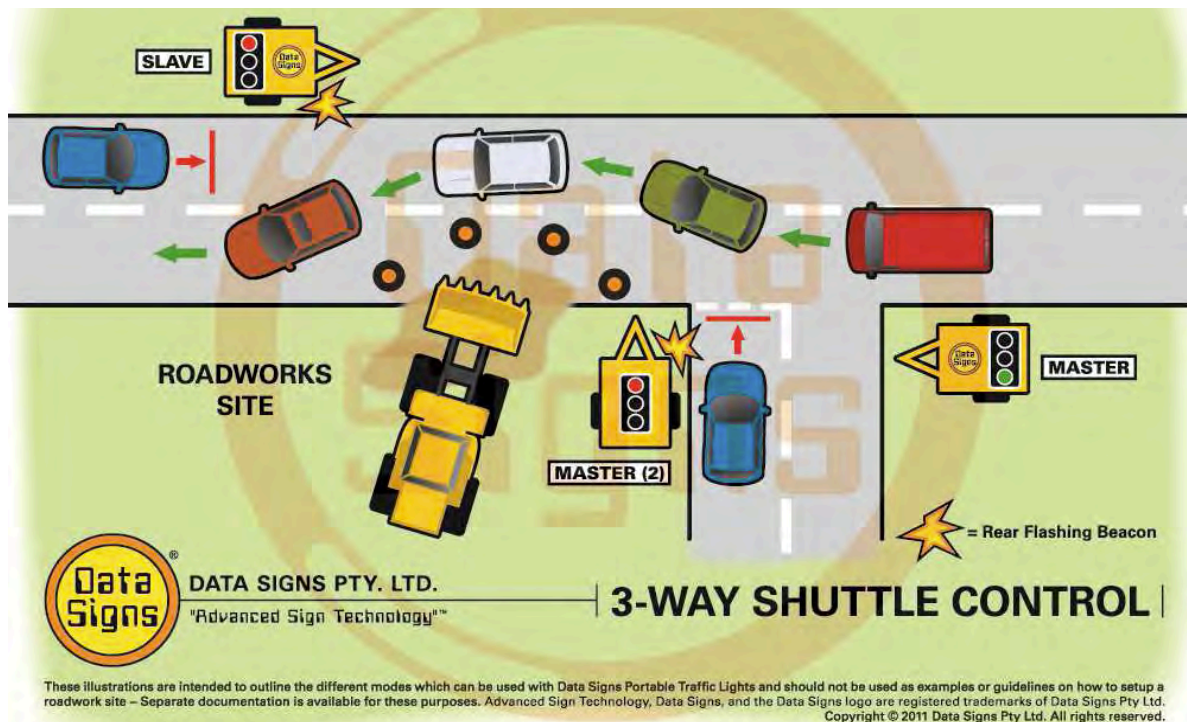
As illustrated in the diagram below, three Portable Traffic Light units can be used to control a three-way intersection; using two Portable Traffic Light sets. The following would be set on each unit:

First traffic light set:

- > Master unit
- > Slave unit

Second traffic light set:

- > Master (2)
- > Slave not used.



Each PTL unit will go to the Green signal phase in turn, and then all units will move to All-Red. To set this up, see the Master/Slave Controller Configuration section below. The Manual, Auto (Timed), and Demand (Vehicle-Actuated) modes are all available. To use 3-Way Shuttle Control, set the Master Controller to SHUTTLE with the key-switch.

The Master and Slave Controllers and the Remote Control, will reflect the aspects displayed on the Master and Slave unit. Press the Amber button on the Master Controller or Remote to switch between viewing the aspects displaying on the first Slave (S1) or the second Slave (S2). If any unit encounters a critical fault (i.e. aspect fault or radio link failure) all units will enter Flashing Yellow mode.

The Remote Control can be used to control the traffic flow if Manual mode. Additionally, the Remote Control can be used to artificially enter a demand when running in Demand mode.

## Intersection, Four-Way Shuttle Control

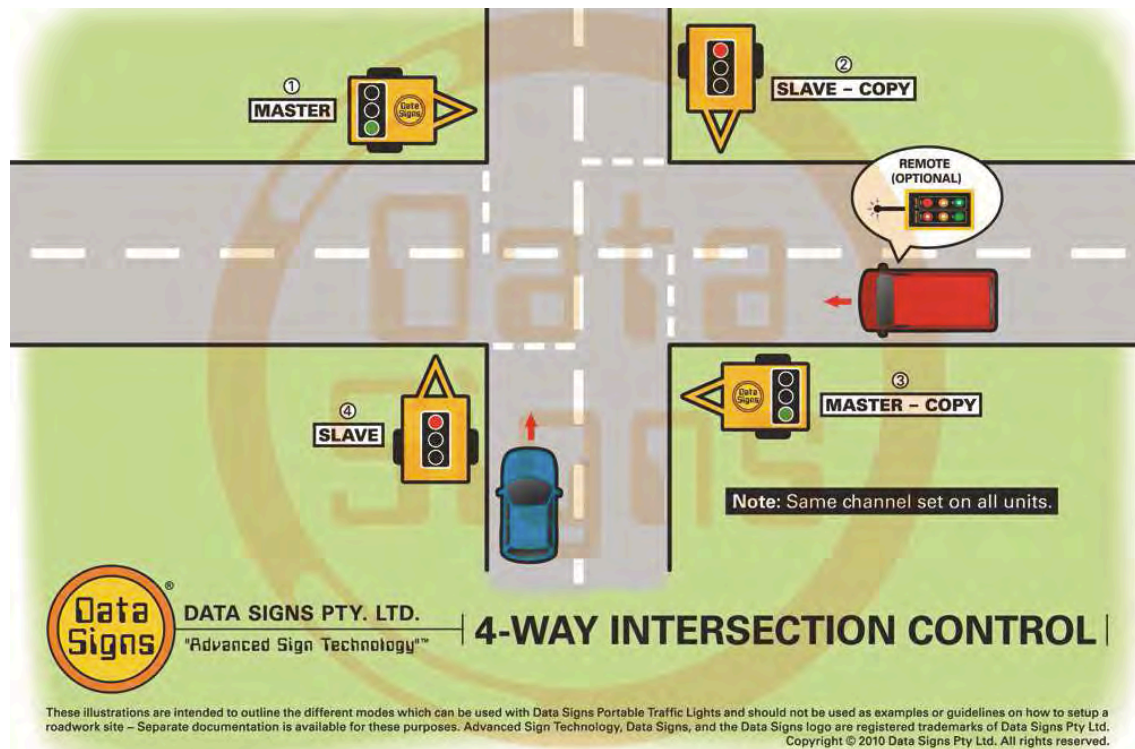
As illustrated in the diagram below, four Portable Traffic Light units can be used to control a four-way intersection; using two Portable Traffic Light sets. The following would be set on each unit:

First traffic light set:

- > Master unit
- > Slave unit (no change)

Second traffic light set:

- > Master-Copy
- > Slave-Copy



The Master-Copy unit will show the same signal aspect as the Master. The Slave-Copy will show the same signal aspect as the Slave.

To set this up, see the Master/Slave Controller Configuration section below. The Manual, Auto (Timed), and Demand (Vehicle-Actuated) modes are all available. To use 4-Way Intersection Control, set the Master Controller to SHUTTLE with the key-switch.

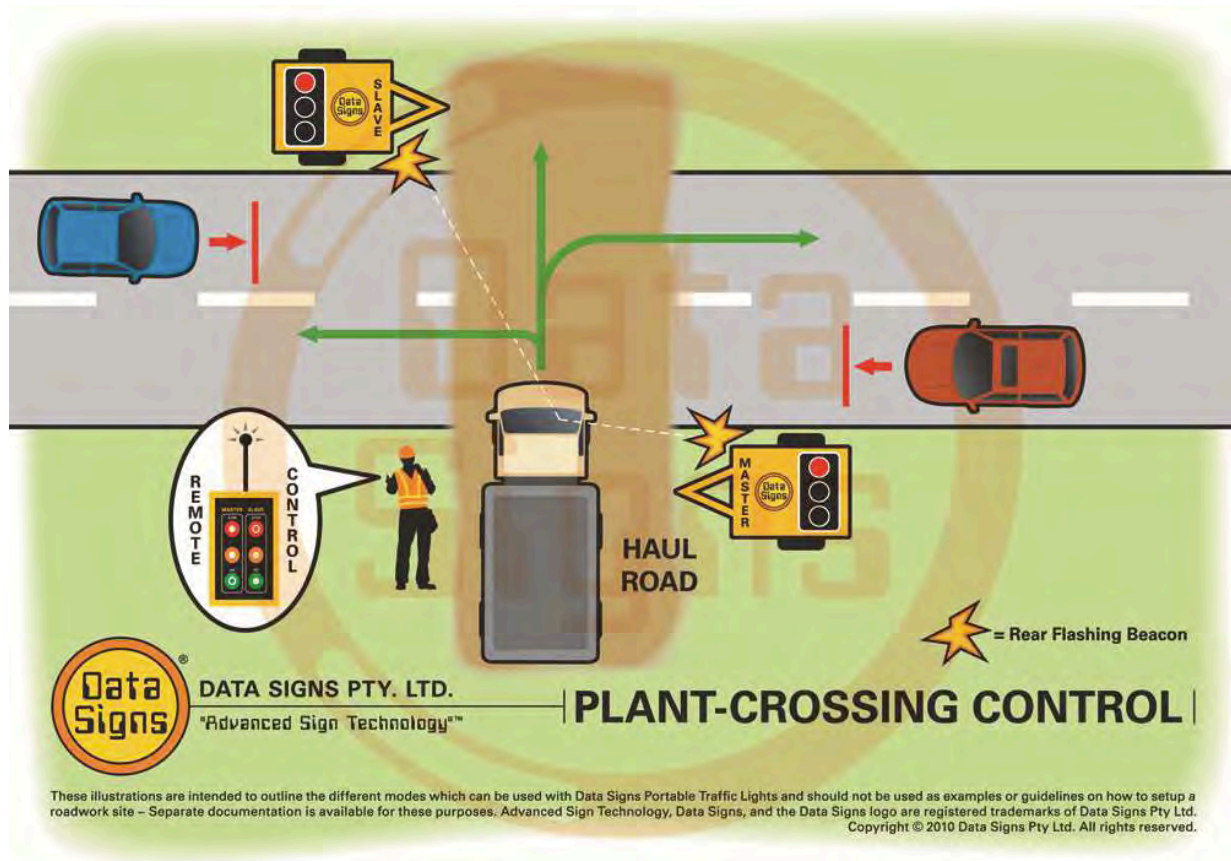
The Master and Slave Controllers and the Remote Control, will reflect the aspects displayed on the Master and Slave unit. If any unit encounters a critical fault (i.e. aspect fault or radio link failure) all units will enter Flashing Yellow mode.

The Remote Control can be used to control the traffic flow if Manual mode is used. Additionally, the Remote Control can be used to artificially enter a demand when running in Demand mode.



## Plant-Crossing Control, Two-Way

Plant-Crossing control is used to enable both directions of traffic flow along a roadway to be simultaneously stopped, e.g. to allow road construction vehicles to cross. The diagram below illustrates Plant-Crossing control usage. Note: This diagram should not be used as a guideline for setting up a roadwork site, it is only provided as an example.



Plant-Crossing Control is active while the left key-switch is in the **PLANT CROSSING** position on the Master Controller. Change the operating Mode for plant crossing control by going into **PROGRAM** Mode with the key-switch. Each operating mode applicable to Plant-Crossing control is explained further below.

Normally, the operator would use a Remote Control to change the Master and Slave unit to the Red signal phase when a plant vehicle requires thoroughfare.

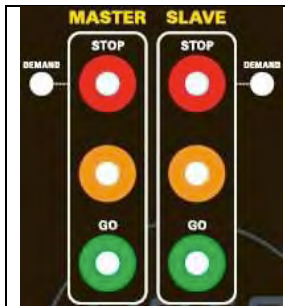
Both the Master and Slave normally rest on the Green signal phase for Plant-Crossing Control.



### Plant Crossing: Manual mode

Buttons used:

- > MASTER: STOP, GO
- > REMOTE: STOP, GO

	<p>On startup, both the Master and Slave will rest on Green signal phase for Plant-Crossing Control until a demand for Red signal is entered by the operator.</p> <p>The operator can then enter a demand for All-Red signal on using either the Master STOP or Slave STOP buttons on the Master Controller or the Remote. Both the Master and Slave units will then show the Red signal phase.</p>
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To change back to Green signal, either the Master or Slave GO button is pressed. When the All-Red time has expired the lights will cycle back to the Green signal. If the Master or Slave STOP button is pressed and the Minimum-Green time has not expired, the DEMAND LED will flash.

Plant-Crossing Control, Manual mode example:

1. Both the Master and Slave are on the Green signal phase.
2. Either the Master or Slave STOP buttons are pressed (on either the Master Controller or Remote Control).
3. If the Minimum-Green time has expired both the Master and Slave will cycle immediately to Yellow and then to Red signal phase. Otherwise - if the Green time has not expired - the DEMAND LED's will flash.
4. Once the Green time has expired, the DEMAND LED's will extinguish and the Master and Slave will cycle to Yellow and then Red signal phase.
5. Both the Master and Slave now show Red signal phase for the preset All-Red interval.
6. If the Auto-Return option is enabled (see below), the Master and Slave will cycle back to Green signal phase automatically after the All-Red interval has expired. Or, if the Master or Slave GO button is pressed (on either Master or Remote Control), the Master and Slave will cycle back to Green signal phase.

### Auto-Return Option

If the Auto-Return option is set, the signal aspects on both the Master and Slave units will return to Green signal phase once the All-Red time has expired. Note: This option is not permitted in some Australian states. Check the guidelines in your state before using this option.

### **Plant Crossing: Auto (Timed) mode**

No buttons are active for this mode on the Master or Remote Control.

In Auto(Timed) mode, the Portable Traffic Lights will operate in cyclic order according to the preset times. These times are set using the Mode key-switch as discussed earlier in this manual.

The preset All-Red Time is used as the All-Red signal phase time for Plant-Crossing Control, Auto(Timed) mode.

The preset Maximum Green Time is used as the All-Green signal phase time for Plant-Crossing Control, Auto(Timed) mode.

Auto(Timed) mode allows plant vehicles to regularly cross over the road, or to turn onto the road. This would suit sites with heavy plant traffic.

**Note:** This mode is not permitted in some Australian states. Check the guidelines in your state before using this option.

### **Plant Crossing: Yellow Flash mode**

No buttons are active for this mode on the Master or Remote Control.

The Yellow Flash mode operates in response to specific fault conditions and can also be manually selected. During Yellow Flash mode, all aspects connected to the Master (i.e. Slaves or Master-Copy) and the Master itself, will flash the Yellow signal at a flash rate of sixty flashes per minute.

### **Plant Crossing: Demand (Vehicle-Actuated) mode**

Demand mode is not implemented for Plant-Crossing Control operation.

### Radio Link Explained



Each Portable Traffic Light is fitted with a high gain antenna. This allows for a reliable radio range of 1.6 km, line-of sight when set to High Power mode, and when both hoists are raised. Note: A different antenna may be fitted to your PTL, depending on the location the units are sold into. All fitted radio link modules communicate on either the ISM (Instrument/Scientific/Medical; 900 MHz UHF) band3, or at 2.4 GHz in units sold into New Zealand or Europe (or as requested).

The radio link module fitted to the Controller, communicates on one of eight channels. This channel is set within **PROGRAM** Mode on the Master Controller, as discussed previously. All units that are to initiate and maintain radio communication must be set to the same channel. This applies to the Master(s), Slave(s) and also the Remote Control.

To ensure continuous communication, the radio link (RF) module may employ frequency hopping throughout these bands; this is done internally within the module and cannot be configured from the Master Controller.

### LINK Lights



The Master communicates with each unit on its channel at approximately two-second intervals. Each time the Master sends data out via the radio link module, the **LINK** TX light on the Master Controller will light up. Each time the Master receives data, the **LINK** RX light on the Master Controller will light up.

The **LINK** lights are also provided on the Slave and Remote units to indicate radio communication between the Master and these units.

### Radio Link Operation

If a radio link between the Master and a Slave unit is disrupted for a continuous five second period, all units will begin operating in Flashing Yellow mode. "CONTACTING SLAVE..." will be displayed on the LCD panel on the Master Controller.

As specified in section 2.8.3 of the Australian Standard, an automatic restart facility is in place to enable re-establishment of the radio link between the Master and Slave. However, only five attempts to restart (after a failure of five seconds or more) are allowed for any twenty minute interval. If this is exceeded, the units will remain operating in Flashing Yellow mode. Manual intervention is required; power-cycle (reboot) all units to restart.

In the event of a radio link failure, check all connections as discussed above and for any interference that may be caused by equipment near one of the units.

**Trouble-shooting:** If the radio link fails regularly, try changing the Channel set on all Controllers, as some interference may be occurring on the operating channel. Power-cycle each unit after the Channel has been set correctly.

If you require further information regarding the radio link please contact Data Signs.

Testing in an industrial area, placing the Master and Slave units line-of-sight to each other, Data Signs was able to position the units up to 2kms from each other and achieve reliable RF link operation.

The Remote Control can be positioned up to 500m from the Master and work reliably.

### Master/Slave Controller Configuration

It is important that the configuration parameters are set correctly for correct operation of the DataSigns-PTL; if you are unsure, please contact Data Signs. As of July 2013, the dipswitch is no longer fitted on the Master and Slave Controller. However, the Remote Control still currently has a dipswitch fitted.

#### Setting RF Values – Master and Slave

Change the RF channel, RF power setting and the RF module type by selecting the MASTER SETTINGS menu item once you select **PROGRAM** Mode using the first keyswitch on the Master Controller. Run through the following:

- RF Channel, which is a value from 1 to 8.
- RF power mode either HIGH or LOW. If HIGH, ensure the PTL Master and Slave are positioned more than 10m from each other.
- RF Module, select the country the PTL's are being used in.
- Unit ID. By default the Master should be set to 0. See below for instructions on setting up a number of PTL's for intersection or 3-way mode.
- Shuttle Mode type, for normal usage select NORMAL.

The Master setup is complete once you turn the Master unit off and back on again with the second keyswitch. If you change the RF values on the Master, these values must also be changed on the Slave unit. Select **PROGRAM** Mode using the first keyswitch on the Master Controller, select the SLAVE SETTING menu item then run through the following:

- RF Channel, which is a value from 1 to 8. Must be the same as set on the Master.
- RF power mode either HIGH or LOW. If HIGH, ensure the PTL Master and Slave are positioned more than 10m from each other.
- RF Module, select the country the PTL's are being used in.
- Unit ID. By default the Slave should be set to 1.

At this point the LCD screen will indicate that the settings have been written to the SD card. Access and remove the SD card from the Master Controller.



Locate the yellow tab on the right side of the Controller.

All Controllers have the tab in the same place.

Remove the yellow tab.





To pull out the SD card, first push it inwards, as it operates as a push-push system.

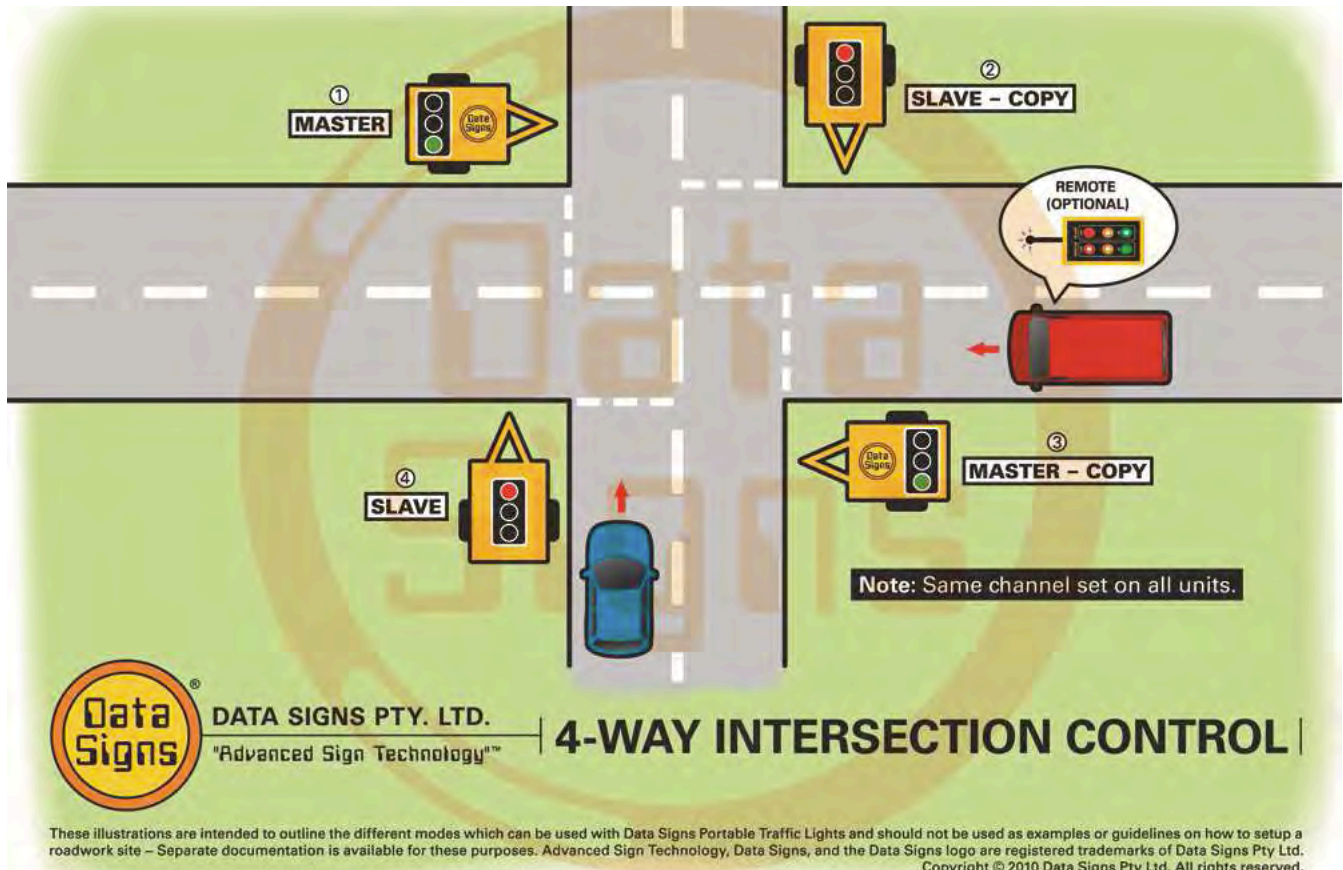
Then pull the SD card out.

Follow these instructions to transfer the settings onto the Slave Controller:

1. Turn the Slave Controller off.
2. Insert the SD card into the Slave Controller.
3. Turn the Slave Controller back on.
4. The LED's on the Slave Controller will flash. Turn the Slave Controller back off.
5. Take the SD card from the Slave and reinsert into the Master Controller.
6. Select SHUTTLE or PLANT CROSSING on the first keyswitch on Master Controller.
7. Turn both the Slave and Master Controller back on.
8. Refit the yellow tab, being careful not to dislodge the SD card.

## 4-WAY INTERSECTION CONTROL SETUP

Four-way Intersection Control is setup using the MASTER SETTING and SLAVE SETTING menu items. Use two PTL sets to setup a four way intersection as described below. Use the Master to setup the Master and Slave, and the Master-Copy to setup the Master-Copy and Slave-Copy.

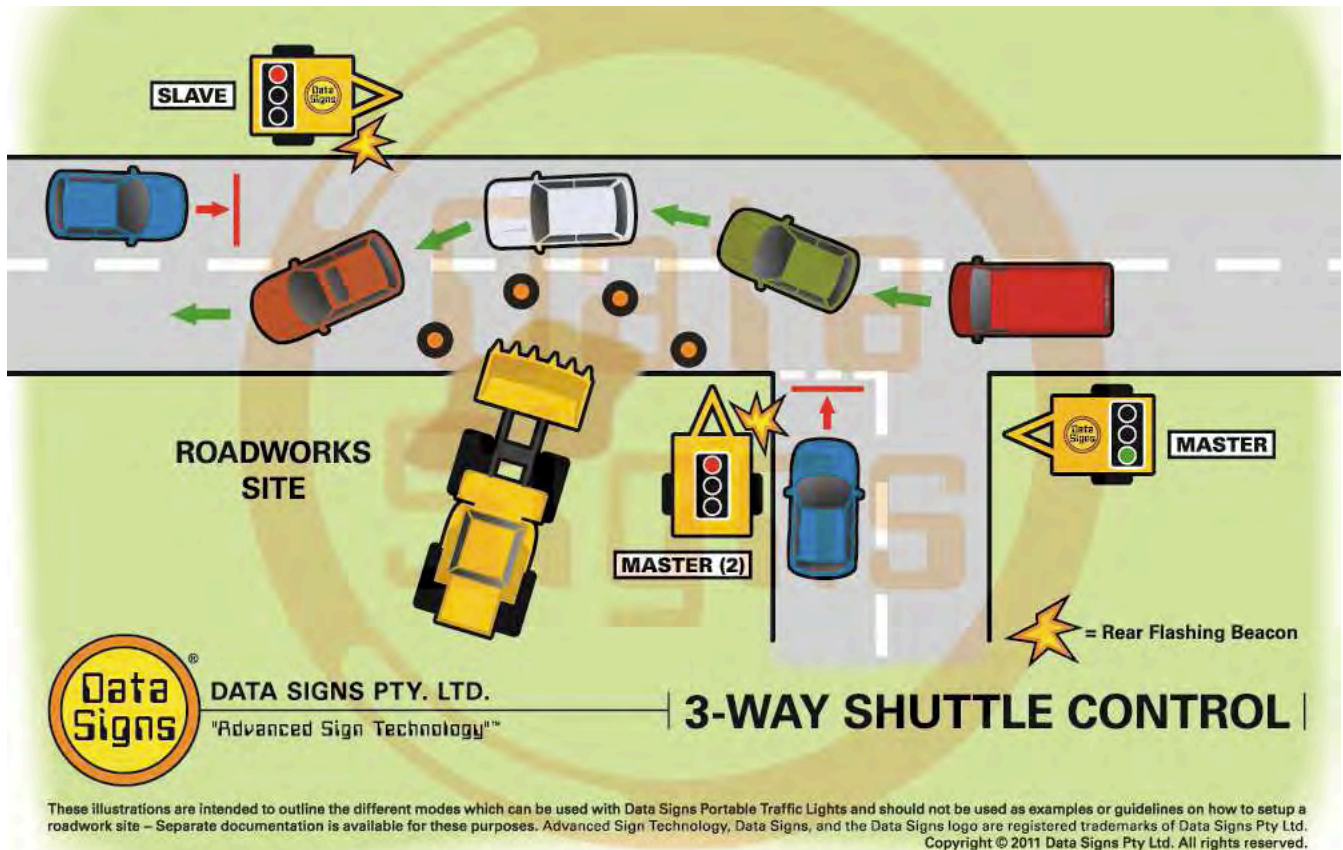


- RF Channel, must be the same for all.
- RF power mode, HIGH recommended.
- RF Module, select the country the PTL's are being used in.
- Unit ID. See the diagram above.
- Control type. See the diagram above.

You can also set separate green times using the **GREEN TIME SET** button while in **PROGRAM** mode. Use the menu that appears to select what to set.

### 3-WAY INTERSECTION CONTROL SETUP

Three-Way Intersection Control is setup using the MASTER SETTING and SLAVE SETTING menu items. Use two PTL sets to setup a 3-Way Intersection. Use either the Slave or Master from the second PTL set. Use the Master to setup the Master and Slave, setup Master(2) using the Controller in Master(2).



- RF Channel, must be the same for all.
- RF power mode, HIGH recommended.
- RF Module, select the country the PTL's are being used in.
- Unit ID. See the diagram above.
- Select SHUTTLE CONTROL from the first keyswitch.

You can also set separate green times using the **GREEN TIME SET** button while in **PROGRAM** mode. Use the menu that appears to select what to set.

## Fault Conditions

If any fault conditions occur as discussed throughout this document, the Portable Traffic Lights will go to Flashing Yellow mode. All critical faults are logged to a file on the SD card fitted to the Master Controller.

The faults logged are outlined below. Reference back to the Australian Standard is provided in the table.

Fault ID	Standards Reference and Description
1	2.8.2 (a). In shuttle control and green aspects shown on both approaches.
2	2.8.2 (b). In plant-crossing control, both approaches not showing red aspect.
3	2.8.2 (c). Green aspect shown on one approach and yellow shown on other approach.
4	2.8.2 (d). Red aspect lamp fails, on any approach
5	Green aspect fails, on any approach.
6	Yellow aspect fails, on any approach.
7	2.8.2 (g). More than one aspect displayed together on the same lantern
8	2.8.2 (h). Communications link disrupted (see below).
9	2.8.2 (i). For radio-link, if the operation is adversely affected by conflicting commands or status data received from another signal system within radio range.
10	2.8.2 (j). If the battery voltage on either Master or Slave drops below required voltage.
11	2.8.2 (k). Flashing yellow beacons fail or if the beacons operate other than during the allred interval. Note: Check resistor is in place.
12	No response from Vehicle Detector

To view the current fault log file, select VIEW FAULT LOG from the **PROGRAM** Mode menu. Use the [↑] and [↓] arrow buttons to move through the fault log entries. The last fault logged is shown first.

A sample fault log entry may be:

```
0 0 : 1 2 : 5 4 , S L A V E # : 0 1
M O D E F A U L T
```

OR

```
0 2 : 1 5 : 5 2 , S L A V E # : 0 5
G R E E N A S P E C T F A I L U R E
```

The time shown with each fault log entry is the time that this fault occurred since the Master Controller was powered up. The second part is the Portable Traffic Light unit affected (i.e. Slave#2 or Master). The last part of the entry is the Fault ID. The second line of the entry shows the fault description.

You can also use an SD card reader on a laptop/PC to read the fault log files from the SD card. The file will be in the LOGS directory on the SD card. Turn the Master Controller off and remove the SD card from its slot, leave the power off while re-inserting the SD card.



### The Remote Control



The Remote Control is used by the operator to control traffic flow when the Master Controller has been set to Manual mode; either in Shuttle or Plant-Crossing operation. It is recharged by placing it in the cradle in the Master Control box. (See instructions below)

When the Remote Control is turned on with the key-switch, it will begin to establish a radio link with the Master Controller. The **LINK** lights will show data being transmitted and received between the Master Controller and the Remote.

To enter a demand for either Red or Green signal phase, press the STOP or GO buttons. On each demand, the DEMAND LED's will flash to indicate a demand on the Master or the Slave. Refer to previous sections regarding comprehensive use of the Remote Control in various operational modes.

The LCD panel will indicate whether the Master is in the correct mode to use the Remote Control. It will also show relevant status and time left for a selected phase. The current signal phase on the Master and Slave (#1) are shown on the Remote Control.

**Note:** There may be a slight delay in the signal phase change shown for the Slave.

If running in 3-WAY SHUTTLE CONTROL mode, press the Amber button to swap between viewing the signal phase for Slave(1) or Slave(2).



When the battery on the Remote Control gets low, a warning message will appear on the LCD panel. To recharge the Remote Control, plug it into the remote cradle in the Control box on the Master unit and switch the keyswitch to the OFF position; **the Remote Control can only be charged while the key-switch is in the OFF position.** When the Remote Control is charging the POWER LED will change from Green to Orange.



The DIPSWITCH on the Remote Control is still used to setup the RF Channel and RF Power mode. Remove the yellow plastic tab on the bottom of the Remote to access the dipswitch.

As shown in the image, the dipswitch is arranged with the 1st switch on the right. Turn the Remote upside down to start with the 1st switch on the left. In the image, the first switch is on (closest to circuit board, all others are off. Turn Remote off to set switches.



Switch 1, 2 and 3 are used to set the RF Channel. There are 8 possible (binary) combinations as outlined in the table below:

RF Channel	Switch 1 (value 1)	Switch 2 (value 2)	Switch 3 (value 4)
0	OFF	OFF	OFF
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON
5	ON	OFF	ON
6	OFF	ON	ON
7	ON	ON	ON

Switch 8 is the only other switch used. This is used to set the RF module type; leave OFF for use in Australia and ON for use in New Zealand.

Once the DIPSWITCH has been set, turn the Remote Control back on.

### Battery Management

From a fully charged condition, the batteries on the Master and Slave units will last approximately 180 hours if solar charging does not occur, i.e. no sunlight for five days.

The DataSign-PTL units will run continuously if its clean solar panels are exposed to at least four hours of full sunlight per day.

From fully charged (above 13V), the PTL-WB will run continuously for at least 1 and 1/2 weeks without requiring a recharge.

The batteries are considered “flat” when the voltage level reduces to 10 Volts. Data Signs recommends charging the batteries if they get below 11.5 Volts.



A Battery Charger is fitted into the PTL-WB, on both the Master and Slave units. This is located under the shelf (below the Controller) in the PTL Control box. On the trailer-mounted DataSign-PTL, the battery charger is an optional extra. It is located in the same position, if fitted.

To charge the batteries, turn the Controller off using the second keyswitch. Then plug the 3-pin socket into mains power. The battery charger has an On/Off switch located next to the socket wire. Check this is set ON.

Fully charging from a completely flat battery takes about 12 hours.

## Troubleshooting Guide

This section contains some tips on handling some of the issues that may arise when using the Portable Traffic Lights. If you cannot resolve the issue you are experiencing using the information below, please contact Data Signs at Head Office or one of our Branches or Service Agents for assistance. As discussed above, the Fault Log stored on the SD card in the Master Controller may assist in issue diagnosis.

### Turning the Controller On

If the POWER light does not come on when the key-switch is turned to ON, check that the INPUT/OUTPUT connector is inserted properly. Check the fuse inside the Controller and on the battery fuse board, and check that the battery voltage is above 10.5 Volts.

### Vehicle Detector Failure

If a vehicle detector unit is attached but the Controller check fails, all connections between the unit and the Controller should be re-inserted. If the unit continues to fail, contact Data Signs. The vehicle detector on each unit is scanned for correct operation every five minutes. If the vehicle detector does not respond due to a fault, the LCD panel on the Master Controller will display the following error message:

V	E	H	I	C	L	E		D	E	T	E	C	T	O	R				
S	L	A	V	E		F	A	I	L	U	R	E	.						
C	H	E	C	K		U	N	I	T	.	.	.							

It may be that the connector has come loose on the vehicle detector, or the unit is not working as expected.

Temporary fix: Use AUTO-TIMED mode until the fault can be identified and resolved.

### SD Card Failure

In the case of SD card failure, you will be notified. Default values for each time will be used if the SD card fails. All parameters can be changed, however this will not be saved, so you will need to enter your desired parameters each time the Master Controller is turned on, until the SD card is replaced.

### Aspects Not Working

Check that the aspects have not been inhibited from the **PROGRAM** menu. Otherwise, you may need to ship the Controller back to Data Signs for repair. Download the Product Service Request form from the Service&Support page on the Data Signs website - [www.datasigns.net](http://www.datasigns.net). Fill this out and include with any equipment being shipped back for repair.

### Fitting the SIM card to the 3G/GPS Module

The Portable Traffic Lights can be monitored remotely if an optional 3G/GPS module is fitted. The unit status and GPS position are reported back via SMS, and the Portable Traffic Lights can be tracked and monitored through the WebVMS™ web-based application. For more details on the setup of the SIM card service, see the “So You’re Purchasing a PTL” PDF document available from Data Signs.

The SIM card required is a normal sized SIM, not a micro or nano-SIM. First, fit the SIM card to a mobile phone and disable the PIN request. To fit the SIM card to the Master Controller follow these instructions.



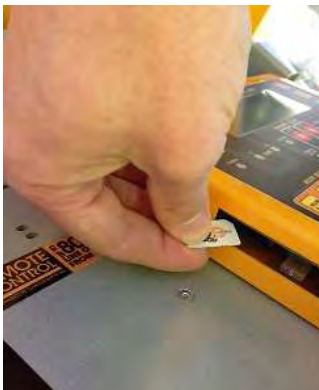
#### On the PTL Master Controller

Remove the PTL Remote Controller if this is fitted. Turn the Master Controller OFF.

Take off the plastic tab on the side of the Master Controller as shown.



Remove the SD card by pushing to pull out.



The SIM card is inserted as shown, with the tab on the bottom.

If possible, lightly coat the metal contacts on the SIM card with WD-40 or equivalent before inserting.



Insert the SD card.



Put the plastic tab back in place.

When re-fitting the plastic tab, it may push the SD card out again. Therefore, push the SD card so that it pops out. Place the plastic tab in position and after fitted, push in to click the SD card in place.



Turn the Master and Slave units on.

The LCD on the Master will show GSM: OFF on startup. After approx. 2 minutes this should change to GSM: ON as shown in the photo.

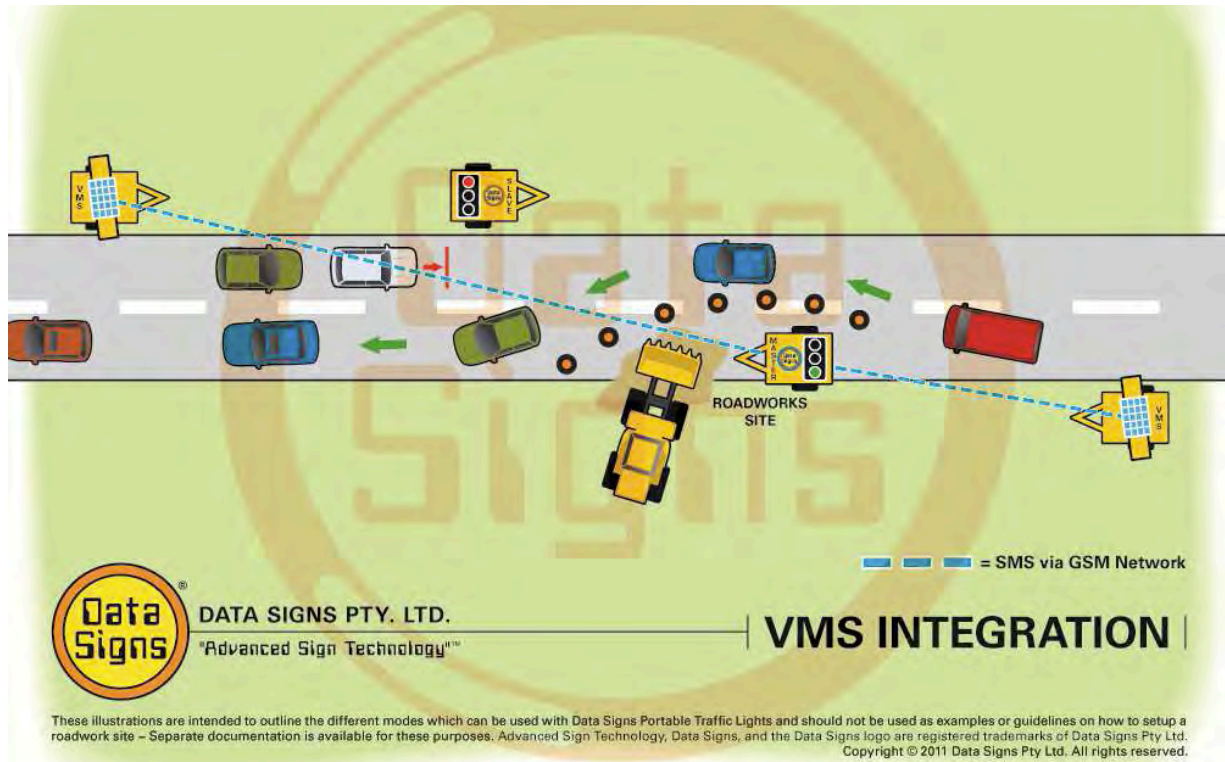
If the LCD shows SIM: ERR then check that the SIM card has been inserted properly.

If the LCD shows SIM: PIN then check that the PIN number request has been disabled on the SIM card.

For setup on WebVMS, once the SIM card has been fitted and the PTL Master is turned on, please email [david@datasigns.com.au](mailto:david@datasigns.com.au) with the SMS number of the SIM card.

### VMS Integration

The PTL Master Controller can be setup to integrate with up to two DataSign-VMS. An optional 3G/GSM module is required with a Sim card fitted for this functionality to be available.



As illustrated in the diagram above, the DataSign-VMS would be setup either side of the roadwork site. During normal operation of the PTL's, the DataSign-VMS would display a normal message file. If a fault occurs on the PTL's and they go into Flashing Yellow mode, the PTL Master could then send a fault SMS message to the number of the SIM card in each DataSign-VMS. For example, PTL FAULT OCCURRED, USE CAUTION. Once the fault has cleared, the PTL Master will then send a Resume Original Message SMS command (.s123456.o) to each DataSign-VMS.

To setup the VMS Integration, select **PROGRAM** Mode using the first key-switch on the Master Controller, then follow these instructions:

1. Select VMS INTEGRATION from the menu and press the **ENTER** button.
2. Select ENABLE and press the **ENTER** button.
3. Enter the SMS numbers of the SIM card in each VMS on the roadwork site.
4. Press the **ENTER** button, and then press the **MENU** button.

This has now been setup.

To disable this option:

1. Select VMS INTEGRATION from the menu.
2. Select DISABLE and press the **ENTER** button.



### SMS Fault Reporting

The PTL Master Controller can be setup to send out fault SMS messages if the PTL goes to Flashing Yellow mode due to a fault occurring. An optional 3G/GSM module is required with a Sim card fitted for this functionality to be available. Up to two mobile numbers can be sent the SMS fault message.

To setup the SMS Fault Reporting, select **PROGRAM** Mode using the first key-switch on the Master Controller. There are a number of sub-menu items.

To enter the mobile numbers, select the SET NUMBERS menu item. Type in the two numbers and then press the **ENTER** button.

Use the SET INTERVAL menu item to set how long after the fault has occurred to wait to send the SMS fault message. The default is the maximum 60 minutes. For example, if the Interval value is set to 20, the SMS fault message will not be sent until 20 minutes after the fault has occurred. This caters for occasion where the PTL's may enter a fault condition due to RF communications failure but then recover shortly afterwards. The operator may not need to be notified of this.

Use the SET ALERT ON/OFF menu item to turn this feature on or off.

### **Add-On Features**

A number of add-on features are available from Data Signs to complement the Portable Traffic Light product. Each of these is discussed below.

#### **Pedestrian Crossing Device**

Contact Data Signs for availability and more information.

#### **Vehicle speed logging and reporting**

Contact Data Signs for availability and more information.

#### **Count-Down SLOW DOWN! LED Sign**

An LED display can be fixed below the aspects on each Portable Traffic Light. It is used to warn drivers to slow down if they approach the Portable Traffic Light too fast. A count-down time is also displayed while the Red signal phase is showing for Auto(Timed) or Demand operating modes. Contact Data Signs for availability.

### **Installing the optional Vehicle Detector**

Information regarding installing the vehicle actuators on the Master or Slave units is provided if the purchase is made at a later date. In most circumstances the vehicle actuators will be fitted to the Portable Traffic Lights before they leave the Data Signs factory.

### **Disclaimer**

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## Interim Acceptance for Temporary Traffic Signal System

**Product:** Data Signs Pty Ltd Portable Traffic Signals PTL-300

**Expiry Date:** 31 December 2013

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This approval covers the temporary traffic signal system manufactured by Data Signs Pty Ltd – Model PTL-300.

The above system has been assessed and accepted by New South Wales Roads and Marine Services (RMS). The RMS assessment does not confirm complete conformance with AS 4191-1994. The system is currently awaiting a final records check by OPUS Research to confirm that it meets the requirements of AS4191-1994.



This product is considered compliant with the requirements of the Code of Practice for Temporary Traffic Management, section B5.

### Conditions of Use

The signal system must be installed and maintained in accordance with the product installation/maintenance manual and relevant NZ Transport Agency specifications. NZ Transport Agency specifications and standards shall prevail where there is discrepancy between the product manual(s) and the NZ Transport Agency specifications and standards.

Installers must ensure that they are familiar with relevant conditions, requirements and limitations of the system.

A copy of this Interim Acceptance Letter must be appended to the Installation Manual.

### Acceptance

This acceptance expires on 31 December 2013 and replaces any previous acceptance.

New installations of this temporary traffic signal system must not be deployed on the state highway network after the expiry date of acceptance unless a further period of acceptance is granted.

The NZ Transport Agency reserves the right to rescind or modify, at any time, acceptance of the Data Signs PTL-300 Traffic Signals System, and may request submission an in-service report.

**Authorised by the National Traffic and Safety Manager**