PTL Compact Type 1 Operations and Maintenance Manual

Your Portable Traffic Lights are compact lightweight traffic lights. As such correct operation for Set-up and Take-down procedure is essential. Please ensure this manual is read and understood before attempting to operate the Data Signs' Portable Traffic Lights (PTL).

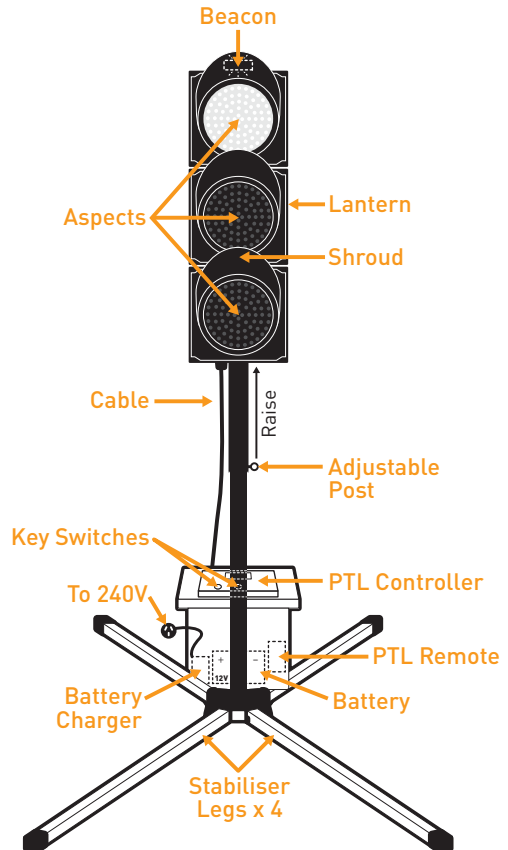Set-up and Maintenance requirements of the PTL are covered by this Manual.

CAUTION:

The Data Sign Portable Traffic Lights should only be operated by qualified traffic managers.

If you have hired out this PTL, contact the Hire Company for assistance.

The PTL Compact TYPE 1 is intended to be used to control localized vehicular traffic flow as a safer substitute for STOP/ SLOW (lollipop) signs. It does not incorporate features such as vehicle detection, solar powered operation or remote monitoring via Data Signs' Web Platform. It is powered by a LiPo maintenance free battery that needs to be recharged at the end of the day. It is not intended to be left unattended on site and can only be operated via the PTL Remote Control which places a safe distance between the actual Traffic Light and the operator.

An overview of the layout of the PTL Compact equipment is provided here.

Beacon · Aspects · Lantern · Shroud · Cable · Raise · Adjustable Post · Key Switches · PTL Controller · To 240V · PTL Remote · Battery Charger · Battery · Stabiliser Legs x 4

■ Installation - Setting Up for Operation

Complete the setup procedure as per the steps below.

Suitable location: Ensure that a level surface is chosen for setup.

Push with your feet on the two levers to allow the stabilizer feet to fall downwards.

> ⚠️ *Take care when the feet fall downwards!*

Do this for both sides as shown.

Once all feet are down, pull the centre post upwards to lock each foot into place.

If required the feet can be placed in the extended position.

Tip the stand on its side as shown and manually set each stabilizer to the next position.

Once the stabilizers are fixed into place, position the light onto the post facing the traffic.

Place the Control Box onto the back legs.

Align the notches in the control box over the metal bracket and lower onto it.

Plug in the cable by lifting the weather flap and pushing the connector in, then pull up the flap until it 'locks' over the plug.

> ⚠️ **If high winds are expected, place sand bags on each of the legs.**

Raise light by extending the post.
Pull out the lower spring clip, lift lights until it clicks back in.

Insert the locking pin and place on lock.
Note: different lock options may be used.

The next section of the manual discusses Startup and operation of the units.

PTL Remote

PTL Controller

This QuickStart Guide covers the PTL Controller Operation as per Australian Standards *AS-4191:2015* plus QLD *MRTS264* and Various State Authority requirements.

Ensure the units are setup as described in the first section of this booklet. This User Manual applies to Controllers operating on firmware 05.00.XX or later.

■ Contents

■ Turning the Controllers On

Both the Master and Slave Controllers are fitted with **ON/OFF key-switches** for security reasons.

As shown, insert the right-side key and turn the switch to the **ON** position for both units.

The POWER lights will come on and the Controllers will begin the start-up sequence.

The Master and the Slave controllers will begin to establish a radio link as indicated by the **TX** and **RX** green lights on the controllers.

Both the units will show Flashing Yellow aspects and progress to showing RED aspects, during this process the Controllers will complete a self-diagnosis.

During Start-up, the display on the Master will show the time remaining in seconds for start-up to complete.

SHUTTLE or **PLANT CROSSING** Control is selected with the left side key-switch.

GATING MODE is selected via the Menu Screens.

The Controllers will start up in the last selected mode if this key position was not changed since last use. If **PROGRAM** selection is activated with the left key-switch, the Controller will wait for further input and all connected traffic lights will display Red.

Note: The left side key cannot be removed from the key-switch while in the **PROGRAM** position. For safe operation, remove the keys after the PTL units have been setup and are operating.

Master Controller: Operational MODE SELECT

Enter **PROGRAM** selection by using the left key-switch on the Master Controller which then allows you to select all other controller programmable functions, use the Up ⬆ or

Down ⬇ buttons to scroll through the MENU selection, then press the ENTER Button **ENTER**

to select the MENU item.

Press the PROGRAM MENU button to exit the selected MENU.

M	A	I	N		M	E	N	U							
	V	I	E	W		P	T	L		S	T	A	T	U	S
✳	Q	U	I	C	K		S	T	A	R	T				
	U	N	I	T		S	E	T	T	I	N	G	S		

QuickStart

This Main Menu item, lets you quickly set up all the necessary items to get the PTL set's going. It will guide you through the process to automatically calculate the correct signal timing for your specific site condition.

1. Master or Slave.
2. Enter control area Length in meters i.e. 500 Meters
3. Enter Site Speed limit in Km/H i.e. 40Km/h
4. The signal timing is then calculated and set.
5. Enter the Green Time.
6. The screen will then display as follows:

S	E	T	T	I	N	G	S		C	O	M	P	L	E	T	E		
T	u	r	n		k	e	y		s	w	i	t	c	h				
t	o		d	e	s	i	r	e	d		o	p	e	r	a	t	i	n	g
m	o	d	e		t	o		b	e	g	i	n						

Note: The MODE SELECT buttons **YELLOW FLASH** **AUTO (TIMED)** **DEMAND** **MANUAL** are not used for Type 1 Compact PTL.

■ 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 provided as an example only.
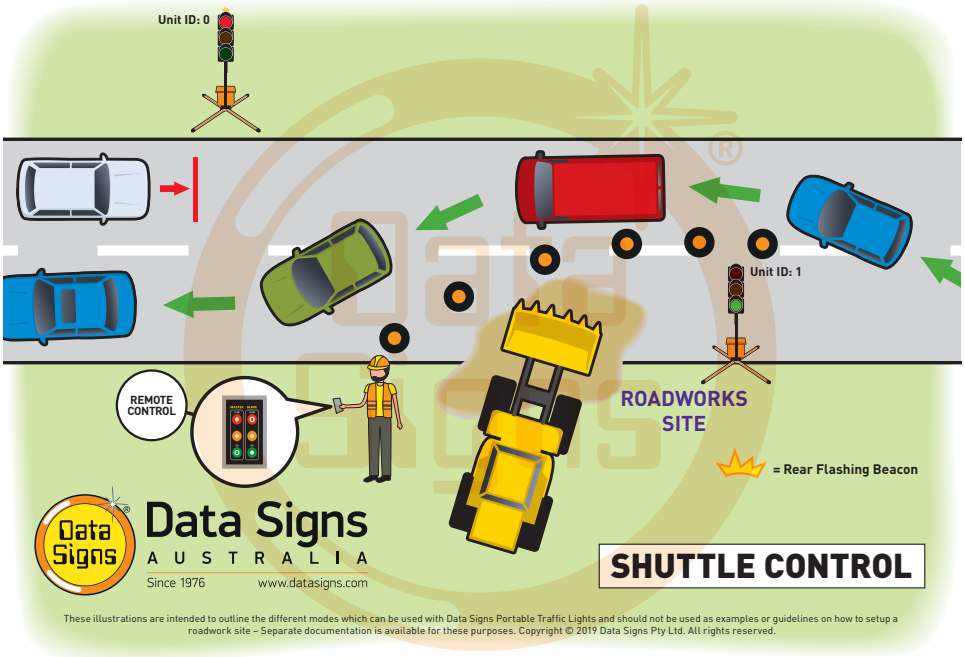
Each PTL unit will go to the Green signal phase in turn, with the All Red sequence in between each green phase. See timing diagram later in this manual.

Shuttle Control is active while the left key-switch on the Master Controller is in the SHUTTLE position. Operating mode using Shuttle Control is described in more detail on the following page.

SHUTTLE MODE.
This can only be operated via the PTL Remote

Buttons used:

STOP or GO on PTL Remote.

A demand for Green or Red signal phase on the Master or Slave is entered on the Remote Control unit. For Shuttle Control, on start-up, 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 the Remote Control. The DEMAND LED is activated indicating a demand for either the Master or Slave.
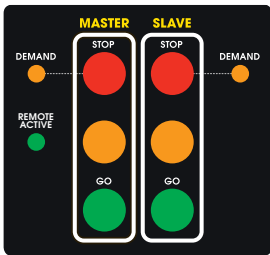
Master / Slave Controller
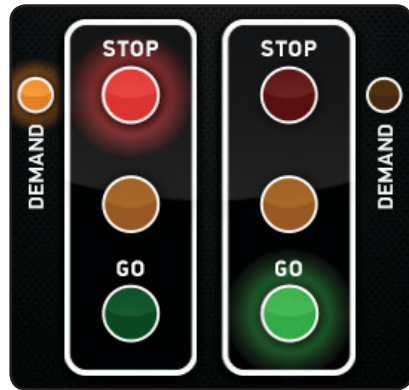
PTL Remote Screen

**Shuttle Control example:**

1. Slave unit is currently showing the Green signal phase.
2. **GO** button is pressed (on Remote Control) for the Master side.
3. If the Minimum Green time (5 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 **STOP** button is pressed, the sequence can then be repeated.

*The **REMOTE ACTIVE** indicator lights up on both the Master and Slave controllers when a button is pressed on the PTL Remote.*

■ Plant-Crossing Control (2-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.
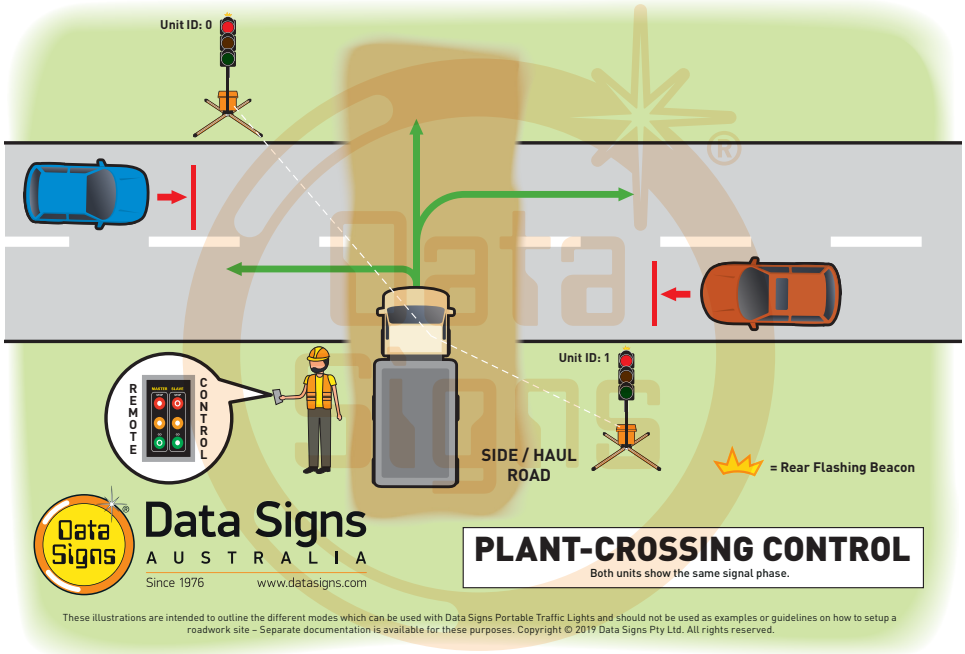
Plant-Crossing Control is active while the left key-switch is in the **PLANT CROSSING** position on the Master Controller.

REAR BEACON LAMP

The Beacon Lamps mounted behind the aspects flash on each unit when the Red Aspects are ON.   This acts as a visual indicator to the Plant (vehicles) Crossing the road that it is safe to do so.

PLANT CROSSING.

**This can only be operated via the PTL Remote**

Buttons used:

STOP or GO on PTL Remote.

On start-up, 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.

The operator can enter a demand for All-Red signal using **STOP** or Slave: **STOP** buttons on the Remote. Both the Master and Slave units will then cycle to Yellow and the Red signal phase.

To change back to Green signal, either the Master: **GO** 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: **STOP** or Slave: **STOP** button is pressed and the Minimum-Green time has not expired, the DEMAND LED will flash.
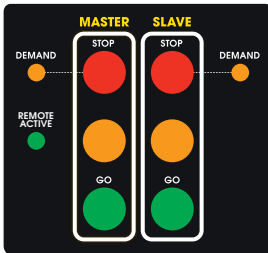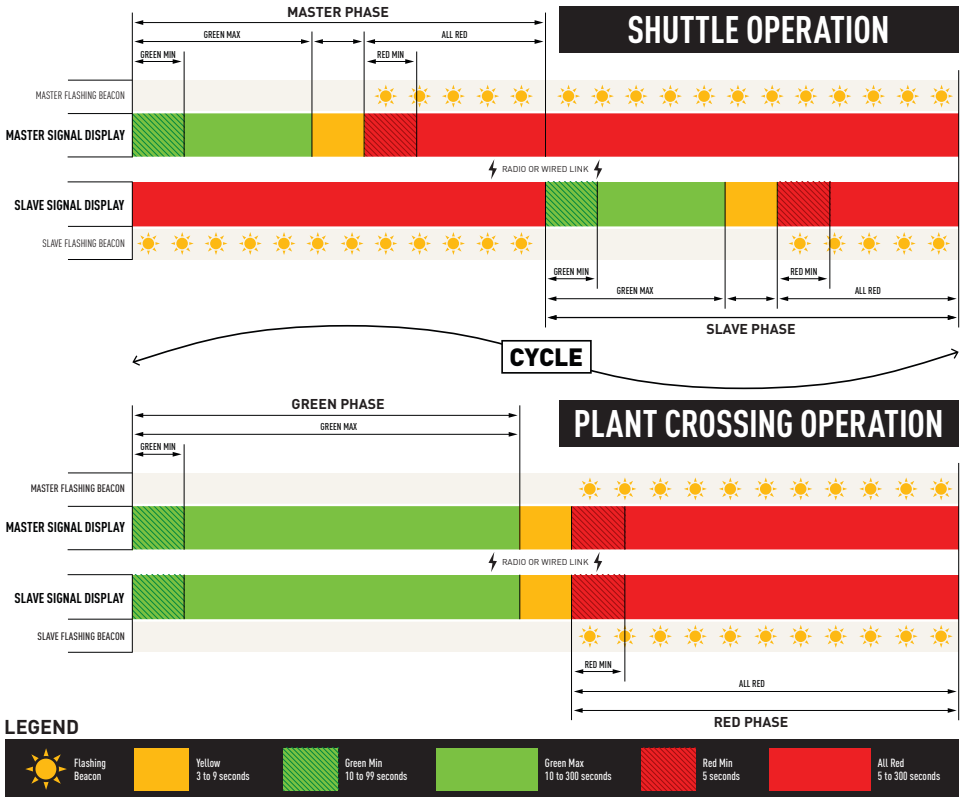

Master / Slave Controller
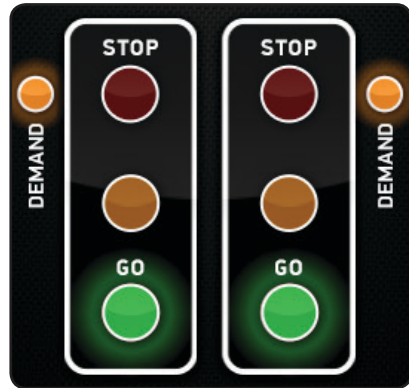
PTL Remote Screen

Plant-Crossing Control, Manual mode example:

1. Both the Master and Slave are on the Green signal phase.
2. Either the Master: **STOP** or Slave: **STOP** buttons can be pressed (on the PTL Remote).
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.

*The **REMOTE ACTIVE** indicator lights up on both the Master and Slave controllers when a button is pressed on the PTL Remote.*

Cycle and Phase Intervals for Shuttle and Plant Crossing

SHUTTLE OPERATION

MASTER PHASE
GREEN MAX
GREEN MIN
ALL RED
RED MIN

MASTER FLASHING BEACON
MASTER SIGNAL DISPLAY

RADIO OR WIRED LINK

SLAVE SIGNAL DISPLAY
SLAVE FLASHING BEACON

GREEN MIN
GREEN MAX
RED MIN
ALL RED
SLAVE PHASE

CYCLE

PLANT CROSSING OPERATION

GREEN PHASE
GREEN MAX
GREEN MIN

MASTER FLASHING BEACON
MASTER SIGNAL DISPLAY

RADIO OR WIRED LINK

SLAVE SIGNAL DISPLAY
SLAVE FLASHING BEACON

RED MIN
ALL RED
RED PHASE

LEGEND

Flashing Beacon	Green Min 10 to 99 seconds	Red Min 5 seconds
Yellow 3 to 9 seconds	Green Max 10 to 300 seconds	All Red 5 to 300 seconds

◼ Gating Control

Single PTL unit use only.

Gating Control is used to control the flow of traffic from a single traffic flow direction only.
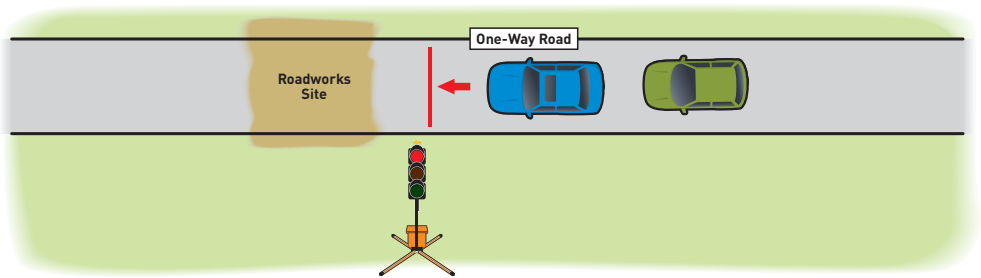
Note: The Gating Operation Mode can only be selected on a controller set up as a MASTER, to activate this mode:
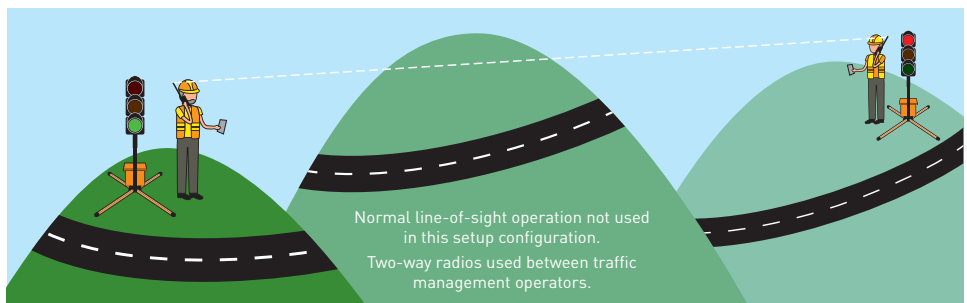
1. Switch the left key to **PROGRAM** MODE.
2. Use the ⬇ button to Select GATING CONTROL and select ON.
3. Switch the Key Switch back to SHUTTLE position.

M	A	I	N		M	E	N	U		[		T	Y	P	E		1		]
	Q	U	I	C	K		S	T	A	R	T								
	U	N	I	T		S	E	T	T	I	N	G	S						
*	G	A	T	I	N	G		C	O	N	T	R	O	L					

G	A	T	I	N	G		C	O	N	T	R	O	L					
		O	F	F														
*	O	N																

To switch off Gating Operation Mode, follow the same process as above, selecting OFF in step 2.

Gating control can also be used with 2 PTL Units operating independently by two traffic operators using a Walky-Talky to communicate with each other.

Normal line-of-sight operation not used in this setup configuration.
Two-way radios used between traffic management operators.

Note: If using 2 PTL Compact in Gating Mode, each PTL must be on its own channel as there in NO radio-link communication between each unit, thus the line of sign or distance limit does not apply.

Note: Two independent PTL Remotes are required for this operation.

■ Type 1 PTSS — PTL Remote Usage

Use the PTL Remote to control the aspects, and other operational requirements.

During operation, **only** the PTL Remote can be used for these functions.

The top of the screen shows the battery level of the PTL Remote. The signal strength between the Master and the PTL Remote is also indicated.

The status box shows current operational type and the countdown timer for the currently displaying aspect.

The main section of the screen shows the aspect state of the connected devices.

Press the Green or Red aspect buttons on the main section of the screen to change the phases being displayed.
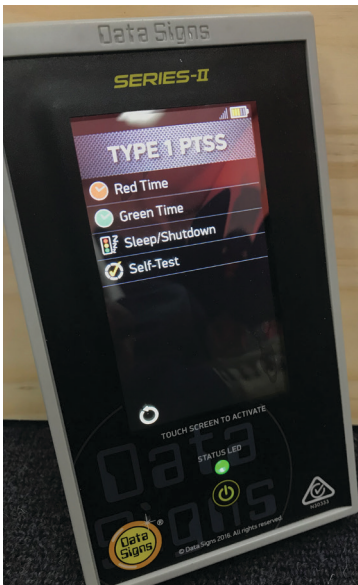
Use the **Settings button** ≡ on the bottom/left of the screen to open the **TYPE 1 PTSS** menu.

From the **TYPE 1 PTSS** menu, the operator can Start-up/Shutdown the connected PTL Compact units, change the pre-set times, and request a PTL Compact self-test to be performed on the connected PTL Compact units.

Type 1 PTSS — Startup and Shutdown using the PTL Remote


From the setting screen, select **Type 1** to navigate through the various functions.

Select **Startup/Shutdown** from the menu.

To startup from shut down state, press the button on the screen for 5 seconds. Alternatively, to startup from an inactive state, use the same button and press for 5 seconds.

In shutdown state, the aspects are disabled and the LCD's on the PTL Controllers are turned off.

Type 1 PTSS — Self-Test using the PTL Remote
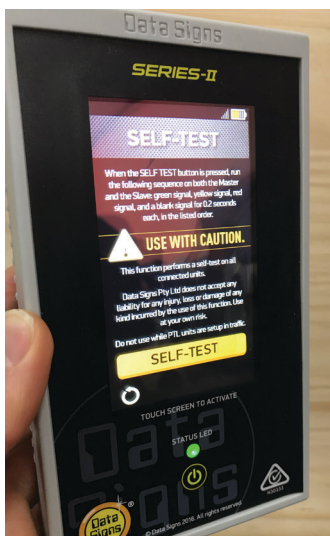
When the SELF TEST button is pressed, the following sequence is run on the PTL Compact to test the aspects, on any connected units:

Green signal, yellow signal, red signal and blank for 0.2 seconds.

> ⚠ *It is advisable that the self-test be not be carried out while the PTL Compact are setup on the roadway.*

SETTING THE RF CHANNEL ON THE REMOTE CONTROL.

To set the RF Channel on the Remote Control, follow these instructions.

1. Press the MENU button ☰ on the bottom/left of the screen to go to settings.
2. Press the RF Channel option. ⊚① RF Channel
3. Enter the new channel number.
4. Press the ENTER button ↵ to save.
5. To re-start normal operation, press the BACK button. ↺

ALL RED AND GREEN TIME ON THE FLY MODE.

Note: The Remote is the only method of control, the Master control is disabled.

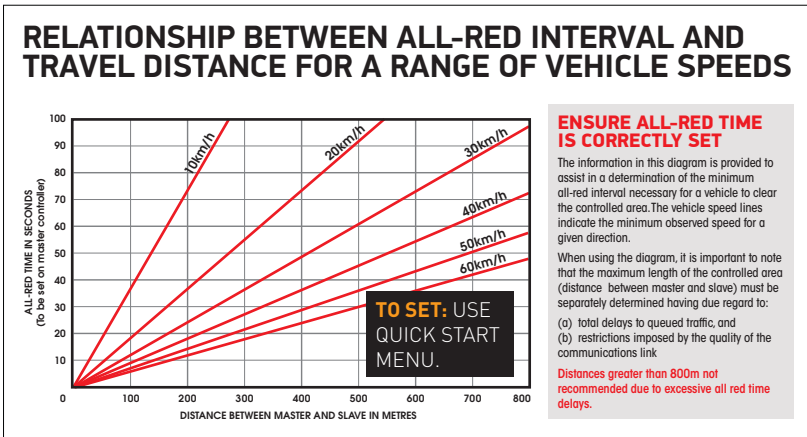You can override the All Red and Green times from the PTL Remote.
Select the Type-1 Menu and then select either the Red or Green times.
Note: This is an "on the fly" function only and the times will be reset back to the preset values set by the QuickStart when the Master Controller power is switched off and turned back on.

■ All-Red Interval Explained

The All-Red interval is the period of time that the aspects on both the Master and Slave units remain on RED *(both the Master and Slave on Red light).*
This allows for the clearance of traffic from within the controlled area.

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

ALL-RED TIME IN SECONDS (To be set on master controller)
DISTANCE BETWEEN MASTER AND SLAVE IN METRES

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

Distances greater than 800m not recommended due to excessive all red time delays.

TO SET: USE QUICK START MENU.

Use this chart to determine the minimum All-Red interval to set depending on the distance between the PTL units and the set speed zone.

For example, if the speed limit in the road-work zone is 40 km/h, and the distance between the Master and Slave units is 500 meters, working along the red line to 40km/h, check where that intersects the distance value, to read off the All-Red Time setting which would be 45 seconds.

We recommend adding several seconds to this for an added safety margin.

■ MAIN MENU

On Master or Slave Controllers.

While the Controller is in the **PROGRAM** setting, use the Up ⬆ or Down ⬇ buttons to navigate forward and back through the MENU's to select all other programming functions.

MENU: VIEW PTL STATUS

When this menu item is selected, all the current settings and status of the PTL controller are shown.

Use the Up ⬆ or Down ⬇ buttons to navigate forward and back through the list.

MENU: QUICK START

Use the **Quick Start** Menu item, this will guide you through the process to automatically calculate the correct signal timing for your specific site condition.

MENU: UNIT SETTINGS

Use this menu to set the Unit ID and Communications settings.

SUB-MENU: ID

The **ID** (unit ID) governs the traffic control sequence. **The Master is ALWAYS unit ID:0** the **Slave is ID:1.**

MENU: OPERATING SETTINGS [Master only]

> *For GATING CONTROL see section on page 13.*

WIRELESS LINK (RF)

Enter the *RF channel* then press the **ENTER** button.
Note: you will also need to change this value to match on the other unit(s) communicating with a Master unit.

Select the RF Power mode. Set to MAX by default. When the units are operating in very close proximity less than 25 meters, select LOW. Otherwise, select MAX (High Power) mode. Then press the **ENTER** button.

MENU: FAULT LOG

Sub-menu: VIEW LOGS

Select this menu item to scroll through the fault log file.

More information regarding the fault log file is provided in the Fault Conditions section of this manual.

Sub-menu: ERASE ALL

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

MENU: FACTORY SETTING

This menu item is restricted to Data Signs internal factory use.

Controller display screens for Master and Slave

Master ID=0 The following values will be shown on the display panel during normal operation

1	2	.	1	V									1	2	.	4	V
			T	Y	P	E		1		P	T	S	S				
N	O	R	M	A	L									G	R	E	E	N
T	0	0	:	0	1		C	H	:	1		0	5	6		S	e	C

First line: Master Battery Voltage. Right side, Slave Battery Voltage. & Signal Strength
Second line: Shows TYPE 1 PTSS.
Third line: Control Type (i.e. NORMAL). Right side, Current light sequence
Fourth line: Current RF Channel. Right side, Current state remaining time

Slave ID=1. The following values will be shown during normal operation:

U	N	I	T		I	D	:	1				1	2	.	4	V
C	H	N	:	1												
C	O	N	N	E	C	T	E	D		T	O	:		1	2	A	4	5
T	I	M	E	O	U	T		I	N	:		0	5		S	e	c

First line: The ID of this unit. Right side, current Battery Voltage.
Second line: RF Channel set on this unit.
Third line: The Serial Number of the Master Controller this unit is connected to.
Fourth line: The current RF timeout value. If this starts to count down there are interruptions to the RF communications.

◼ Wireless Link (RF) Explained

Each Traffic Light Trailer is fitted with an aerial — located on the top of the control box. This will provide Wireless Radio (RF) communication between the PTL units; however, the units still need to be positioned line-of-sight to each other.

The physical range is also limited by the maximum allowed All-Red time, and safe roadwork site requirements. At the maximum All-Red Time of 55 seconds with vehicles traveling at 40 km/h works out a separation between Master and Slave of about 600m. States/territories may also have maximum operating distance guidelines. For the compact PTL the maximum distance is about 600m

The radio link module fitted to the PTL unit communicates on one of eight channels. This channel is set with **PROGRAM** Mode on the Controllers, as discussed previously. All units must be set to the same channel maintain wireless communication. This applies to the Master, Slave(s) and the Remote Control.

Radio Link Operation

If the radio link between the Master and a Slave unit is disrupted for a continuous five second period (the default time) all units will revert to red lights and *"CONTACTING SLAVE..."* will be shown on the display panel on the Master Controller.

Signal Strength

The Remote Control will display the signal strength between the Master Controller and itself as a Graphic symbol in the top right corner on the display. The Master and Slave Controllers display the Signal Strength alternating with the Battery Voltage on the display. The RF Signal Strength is a value out of 5, where 5 is the strongest value.

■ Fault Conditions

If any fault conditions occur as discussed throughout this document, the Portable Traffic Lights will go to Red Aspect display.

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	Description
0	Yellow (Open)
1	Yellow (Short)
2	Red (Open)
3	Red (Short)
4	Green (Open)
5	Green (Short)
6	More than one light on at the same time (short between lights)
16	Excessive Link, tried to connect more than 5 times within a 20 minute period
17	Link Conflict, Another Master or Slave is active
18	Link Timeout, lost contact with Master or Slave
20	Low Battery, low battery mode reached

To view the current fault log file, select **FAULT LOG → VIEW LOGS** 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:

```
FAULT  LOG  (1/1)
XX/XX/XXXX  00:00:14
00 - MASTER
Yellow (Open)
```

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 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.

■ 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 on the Help Desk Via the Web site. 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 controller connector is inserted properly.
- Check the fuse inside the Controller and on the battery fuse board.
- Check that the battery voltage is above 10.5 Volts.

Radio Wireless Link failure
If the radio wireless 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

SD Card Failure

> **Never insert or remove the SD-Card with the power on, switch key to OFF first.**

In the case of SD card failure, you will be notified on the display. Default values will be used if the SD card fails. All parameters can be changed, however they 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 the connections on the controller or the aspects.

If you need to ship the Controller or parts back to Data Signs for repair. Download the ***Product Service Request form*** from the ***Book a Service page*** on the Data Signs website: www.datasigns.com.au
Fill this out and include with any equipment being shipped back for repair.

> Note: If shipping Controllers it is recommended to ship as a set, i.e. Master, Slave and Remote. It will benefit to ship all these items as this will enable our service department to perform a full operational test and diagnosis.

This manual complies with the Specification *MRTS264 Type-1 Portable Traffic Signals* and where relevant *AS4191-2015 Portable Traffic Signals.*

Each state or territory has its own guidelines and training or accreditation requirements for the use of the DataSign-PTL-COMPACT on public roads, particularly for road works usage.

The usage and training requirements are outside the scope of documentation provided by Data Signs. The list below serves as a guide only; please contact the road traffic authority in your state or territory for more information.

- In New South Wales, refer to the *Traffic Control at Work sites* document released by the RTA/RMS. Note the training requirements in section 2.4.
- In Victoria, refer to the *Road Management Act 2004 – Worksite Safety – Traffic Management*, Code of Practice for guidance on the use of the DataSign-PTL on roads in Victoria. Note the training requirements.
- In Queensland, see the Traffic and Road Use Management (TRUM) manual that is issued under the authority of Section 166 of the *Transport Operations (Road Use Management) Act 1995.* Also see the *Manual of Uniform Traffic Control Devices* (Queensland), which within the meaning of the *Transport Operations (Road Use Management) Act 1995*, contains the design of, and the methods, standards and procedures in relation to every sign, signal, marking, light or device, installed on a road. Training requirements are available from the Main Roads QLD website.
- In Western Australia, see the *Traffic Management for Works on Roads - Code of Practice*. Note the accreditation requirements. Also see the *Traffic Controllers' Handbook.*
- In South Australia, there is a Work zone Traffic Management course.
- Generally, the *Australian Standard AS 1742.3–2002: Manual of Uniform Traffic Control Devices, Part 3: Traffic Control Devices for Works on Roads* should also be consulted.

Suggestions & Improvements
Data Signs develops its products with the end users in mind. As such, we are always open to suggestions for product improvement. Contact Data Signs, Head Office in Australia at: dsinfo@datasigns.com.au

Disclaimer