

Motus Traffic Limited

ITC-3 Technical Reference Guide Handset Commands

Version 1

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


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1 Introduction

1.1 Scope

This document provides user information about how to use the Handset Command Terminal of the ITC-3 Traffic Signal Controller developed by Motus with Swarco.

1.2 Document Structure

Table 1 - Document Structure

Section Number and Name	Description of Content
1 Introduction	Scope and related documents
2 Handset Set-Up	How to set up the terminal in the web interface
3 Handset Commands	Tables of handset commands
4 CLF In More Detail	CLF commands with examples

1.3 Related Documents

Other documents exist relating to the controller and are listed below:

Table 2 - Related Documents

Title	Description of Content	Document Reference
ITC-3 User Guide	User guide for the ITC-3 Traffic Signal Controller	MOTUS/139/090000/001/A
ITC-3 Web Interface Manual	Detailed Description of Web Interface (not yet released)	MOTUS/139/090000/003/A
ITC-3 Training Manual	ITC-3 Training Manual	MOTUS/139/090000/004/A

2. Handset Set-Up

2.1 Configuring the Handset Terminal

The terminal is a standard powered 25pin RS232 port. Connection can be made by laptop or other terminal device such as a TechTerm or Oyster Terminal. The default connection settings are configured using the web admin pages. The default comp port settings are. 1200 baud, 7data bits, Even parity, 1 stop bit and no flow control. The configuration text is given below:

```
name=/dev/ttyS0  
speed=1200  
opt=7-E-1
```

These settings are changed via the Web Pages. First navigate a web browser to the IP address of the controller. The default setting is:

```
http://192.168.0.75
```

Log on to the webpage using the credentials supplied by Motus Traffic Limited. The following screen will be displayed. Click on the start button on the bottom left of the page to open the menu to select the Packages option:

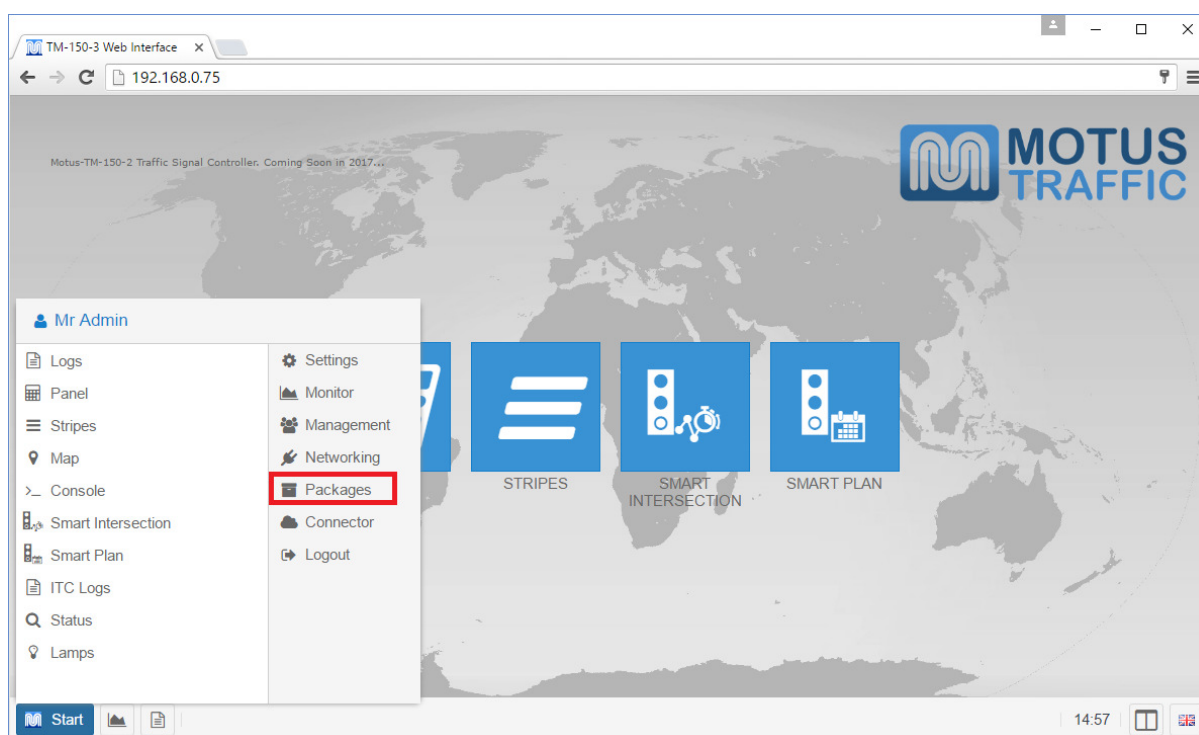



Figure 1 – Opening the Packages Window from the controller webpages

The packages window will open in a medium sized window that will need to be maximised in order to view all the options. Click on the  icon to maximise the window. This will show all of the options. Click on the UK engineering terminal option, circled in red on the following page.

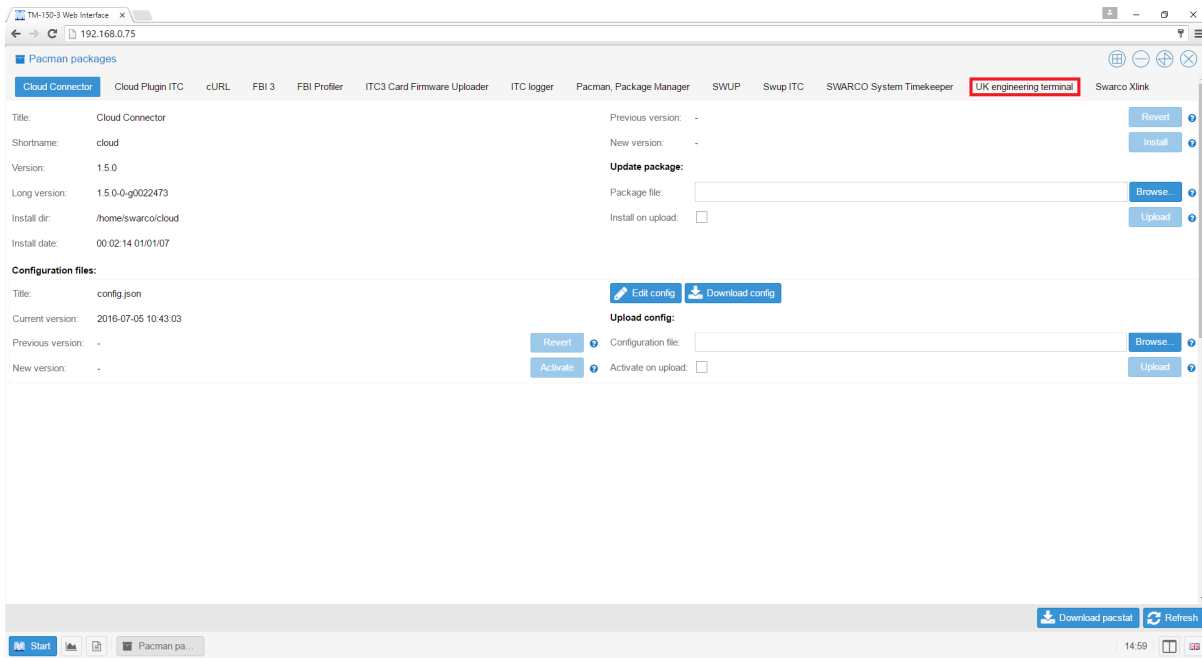


Figure 2 – Navigating to the UK engineering terminal options

The UK engineering terminal will show the version information for the UK terminal. It also has a button so that the configuration settings can be edited from within the webpages. Click on the 'Edit config' button circled in red in **Figure 3** below.

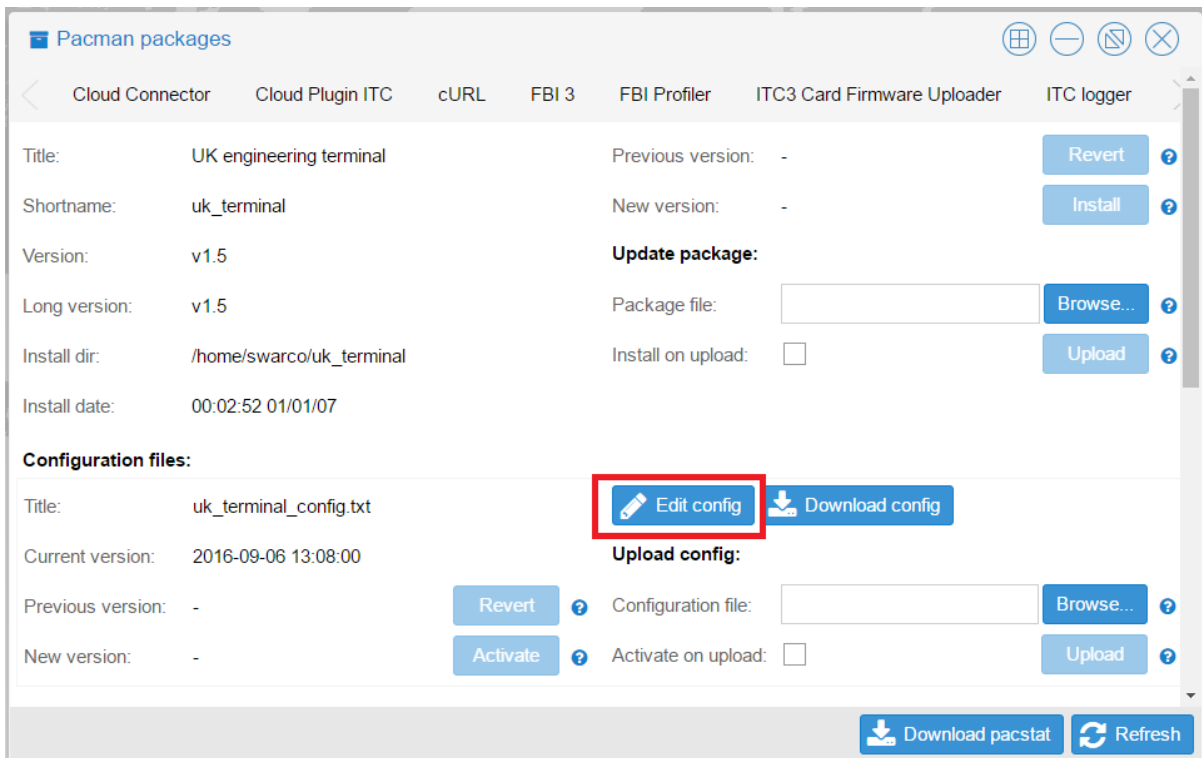


Figure 3 – Opening the configuration editor for the UK engineering terminal

The config editor is a simple dialog box where the user can change the terminal settings. The baud rate is governed by the speed parameter. Baud rates up to 115200 are supported. The opt parameter stores three common terminal settings: data bits, parity and stop bits. Parity options are E for even, O for odd, and N for none. Simply change the settings and click the 'Save' button to store the changes. The controller will need to be rebooted after this operation to restart the terminal with its new settings.



Figure 4 – Editing the configuration editor for the UK engineering terminal

Optionally, the handset may be configured to use the name `/dev/swarco/modem`.

2.2 Syntax and Formatting

When connected to the terminal, pressing enter (Carriage Return) should return:

>

Currently there are several reply codes indicating different states. They are listed below.

Table 3 – Motus Terminal Interface Syntax Replies

Reply	Meaning
*S	Syntax Error, text not recognized
*V	Value Error, the entered value did not match format expected
*R	Range Error, the entered value was out of range of acceptable values
*A	Authorisation Error, command needs higher access level

There is no requirement for upper or lower case, either case is acceptable, the terminal will use upper case. If a mistake is made, it can be corrected before the **ENTER** or **RETURN** key is pressed.

2.2.1 Displaying a Parameter

When displaying a parameter the controller will follow the mnemonic with a colon, then the value. For example Minimum Green for Phase C would return:

```
> MIN C
MIN 3 [C]: 6.0
```

Currently the group number and phase letter are both showed in the command. It is anticipated that eventually only the phase letter will be returned.

2.2.2 Scrolling a Parameter

When displaying a parameter, such as MIN C, pressing the + or – keys will scroll to the next parameter for example pressing – will display MIN 2 [B], and pressing + will display MIN 4 [D].

2.2.3 Changing a Parameter Value

Currently when a parameter such as MIN 1[A] is displayed, the mnemonic will have to be re-typed, followed by the parameter e.g. phase letter or group number, followed by = and the value. For example to change the value of Maximum Green phase A, the alternative Maximum Green VA Set 1 value for phase A, the user would need to type *MXX 1 A=30*.

It is anticipated that in a future update to the terminal the ability to press = after the last returned parameter will automatically all the user to try to set the value. The terminal will accept or reject the change subject to value and permission level.

2.2.4 WID Command

It is important to be able to restrict the terminal to a certain length of characters for correct display on small terminal devices. The WID command can set the number of characters displayed before a Carriage Return. The range is 14 to 80 characters. The default is 20. This is particularly important to Pass-Through mode as many of the replies are quite long.

2.3 Level Access Commands

The Command LEV is used to change access levels in the controller. Level 3 access is only granted when the user presses the Key button within 10 seconds of requesting Level 3 access to ensure that there is someone on site when the Terminal is granted L3 access. If after 10 seconds the Key button is not pressed, the controller will grand L2 access only.

Table 4 – Access Levels

Command	Controller Access Level Reply	Meaning
LEV=1	LEV: 1	Closed code levels
LEV=2	LEV: 2	L2 access granted
LEV=3	LEV: 2	Key button on display not pressed within 10s, L2 access granted
LEV=3	LEV: 3	L3 access granted as Key button on display pressed within 10s.

L3 access has a 5 minute timeout.

3 Handset Commands

The Commands below are implemented in firmware 7.0 or later.

Table 5 – Commands

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
ADF	Accept Detector Faults	-	-	-	-	-	-	-	1 R/W	Extinguishes FM lamp. Detectors with faults accepted are appended with EA. For example: DET 1[A-MVD]: 1EA
CBS	Control Block Status	CB index	-	-	Control Block 1 – 200	-	-	-	1 R/O	+1 = signal input is active, +2 = waiting for an event, +16 = subroutine, +32 = subroutine call is active, +64 = registers can not be reset, +128 = disabled
CDT	Control Block Parameter	Parameter index	-	-	Parameter 1 – 240	-	-	-	3 R/O	Control block parameter
CIC	Configuration Version	-	-	-	-	-	-	-	1 R/O	Name-issue-edit number
CID	Controller ID	-	-	-	-	-	-	-	1 R/O	Hardware Rack Backplane Number
CII	Intersection Name	-	-	-	-	-	-	-	1 R/O	Intersection name
CIO	Intersection Owner	-	-	-	-	-	-	-	1 R/O	Intersection owner
CLA	CLF Action Input	Action Input 1 – 80	-	-	Type Software Hardware	Mode Off / On Norm / Inv	Input 1 - 65535	-	2 R/W	CLF Action Input for use with SA and EA CLF instructions. Example CLA 1: Software-Norm-000255
CLC	CLF Plan Cycle Time	CLF Plan 1-16	-	-	Time 0 – 255s	-	-	-	3 R/W	CLF Cycle Time for each of the 16 CLF plans.
CLF	CLF Plan Status	Stream No. 1-8	-	-	In CLF Yes/No	Current Plan 1 – 16	Cycle Counter 0 – 255	Action	1 R/O	IM – Immediate Move DD – Demand Dependent Move PX – Prevent Except HS – Hold Stage VA – Isolate to VA SA – Skip next action if action input active EA – Execute next action if action input active
CLI	CLF Plan Influences	CLF Plan 1-16	Action No. 1-128	-	Action Mnemonic	Stream Number 1 – 8	Stage 0 – 15	Time 0 – 255	2 R/W	Mnemonics as for CLI, see section 2.5 for more information.

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
CLT	Force CLF Plan	-	-	-	CLF Plan 1 – 16	-	-	-	2 R/W	Forces a CLF plan, CLT=0 cancels.
CRF	Clock Reference	-	-	-	Source 0 – 1	-	-	-	2 R/W	Clock source. 0 is crystal, 1 is mains frequency. Set to 0 if using time server such as NTP.
DAS	Detector Active State	Detector Logic 1-200	-	-	State 0 – 3	-	-	-	2 R/W	State of Detector Logic Input Mode. States are: 0 Detector input forced OFF 1 Detector input forced ON 2 Detector normal Input 3 Detector inverted Input
DCL	Detector Call Delay Period	Detector Logic 1-200	-	-	Time 0 – 25.5s	-	-	-	2 R/W	Call delay period before a detection is registered.
DCN	Detector Call Cancel Period	Detector Logic 1-200	-	-	Time 0 – 25.5s	-	-	-	2 R/W	Cancel delay period before a detection is registered.
DET	Detector Status	Detector Logic 1-200	-	-	0 – 1 (E)(A)	-	-	-	1 R/O	Read only, 0 if inactive, 1 if active. E means that there is a detector fault. A means that the fault has been accepted by ADF.
DFA	DFM Active Fault Duration	Detector Logic 1-200	-	-	Time 0 – 255m	-	-	-	2 R/W	Sets the fail active time. Configuration option is minutes or seconds.
DFI	DFM Active Fault Duration	Detector Logic 1-200	-	-	Time 0 – 255h	-	-	-	2 R/W	Sets the fail inactive time. Configuration option is hours or minutes
DFM	Detector Fault Monitor Status	-	-	-	Name & No. of Failed Detector Logics	-	-	-	1 R/O	Read Only This returns the name and number of any failed detector logics. To scroll down, simply use the down arrow.
DSR	Detector Self Reset	Detector Logic 1-200	0 – No. of activations	-	No. of act 0 – 255	-	-	-	2 R/W	Used on bus detectors, the detector will reset after a DFM fault provided that the required number of activations have been seen with the appropriate gap time between them.
			1 – Gap time	-	Gap Time 0 – 2 55s	-	-	-		
ERR	Current Fault Log	-	-	-	-	-	-	-	1 R/O	Displays contents of current fault log. 64 Entries. Displays one error at a time. Use SHIFT + to increment.
ETH	Ethernet IP Address	-	-	-	IP Address	-	-	-	1 R/O	Use the web pages to set the IP address

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
EXT	Detector Extension	Detector Logic: 1-200	-	-	Time 1 – 25.5s	-	-	-	3 R/W	Detector Green Extension Time
FCT	Fixed Cycle Time	-	-	-	Time 0 – 255s	-	-	-	2 R/W	Cycled Fixed Time Counter
FIX	Fixed Time Influences	Instruction 1-128	-	-	Stream Number 1 – 8	Stage 0 – 15	Time 0 – 255	-	2 R/W	Similar to CLI, except IM moves only. Separate data with space. For example FIX 1 =1 3 20 would be Fixed Time Plan Ins 3, IM in stream 1 to stage 3 at time 20s.
FVX	FVP Max Green Time	Alt. Max Green 1-8	Phase A – CR	-	Time 0 – 255s	-	-	-	3 R/W	Maximum Green time when phase is FVP type VA.
HCD	Hurry Call Delay	Hurry Call 1-8	-	-	Delay 0 – 255s	-	-	-	2 R/W	Hurry Call delay time in seconds.
HCH	Hurry Call Hold	Hurry Call 1-8	-	-	Hold 0 – 255s	-	-	-	2 R/W	Hurry Call Hold time in seconds.
HCP	Hurry Call Prevent	Hurry Call 1-8	-	-	Prevent 0 – 255s	-	-	-	2 R/W	Hurry Call Prevent time in seconds. Note this starts at beginning of HC Hold.
HCS	Hurry Call Status	Hurry Call 1-8	-	-	-	-	-	-	1 R/O	This command will return the period, i.e. delay, hold or prevent, with the time counting down in real time. Displays N/A if no HC configured or timers not running.
HLD	Historical Log Detectors	-	-	-	-	-	-	-	1 R/O	Historical Detector Error Log. Stores 255 entries before overwriting.
HLE	Historical Log Errors	-	-	-	-	-	-	-	1 R/O	Historical Error Log. Stores 255 entries before overwriting.
HLV	Historical Log Events	-	-	-	-	-	-	-	1 R/O	Historical Event Log. Stores 255 entries before overwriting.
HLL	Historical Log Lamps	-	-	-	-	-	-	-	1 R/O	Historical Lamp Error Log. Stores 255 entries before overwriting.
HLP	Historical Log Plan Change	-	-	-	-	-	-	-	1 R/O	Historical Plan Change Log. Stores 255 entries before overwriting.
IGN	Intergreen duration	From Phase A – CR	To Phase A – CR	-	Time 0 – 25.5s	-	-	-	3 R/W	Intergreen time. Space between i1 and i2. Example is IGN A C
IGS	Starting Intergreen	-	-	-	Time 0 – 25.5s	-	-	-	3 R/W	Starting Intergreen time.
IOO	Intersection Signals ON/OFF	Intersection 1-4	-	-	0 – OFF 1 – ON	-	-	-	3 R/W	Turns all signals ON or OFF for the specified Intersection. (Collection of streams)

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
IPD	Display Digital Input	Starting Input 1-128	-	-	-	-	-	-	1 R/O	View the status of digital inputs, in blocks of 16. Currently not a live view, but a snapshot.
IPS	Input State	Starting Input 1-128	-	-	Mode 0-3	-	-	-	2 R/O	This parameter acts as a filter before the configuration is read into the firmware. Usually this filter is applied through Status Menu: Simulate Input. 0: Not Forced 1: Forced ON 2: Forced OFF 3: Force Pulse
LEV	Level Access	-	-	-	Level 1 - 3	-	-	-	- R/W	Default level is 1. Can only achieve Level 3 access by typing "LEV=3" pressing ENTER then pushing the Key button on the physical display within 10s. Otherwise the user will be granted Level 2 access only.
LMD	Lamp Monitoring Data	Phase Letter A - CR	Colour R Y G A	-	-	-	-	-	1 R/O	Returns the phase, colour, power in watts, voltage, and current in mA.
LMP	Lamp Monitoring Profile	Phase Letter A - CR	Colour R Y G A	-	-	-	-	-	1 R/O	Displays the Lamp Profile in use for the phase/colour selected.
LMR	Lamp Monitoring Relearn	-	-	-	2	-	-	-	3 R/W	LMR=2 selects a relearn of all lamp monitoring.
LMT	Phase Lamp Test	Phase Letter A - CR	Colour R Y G A	Level 0 - 4	-	-	-	-	3 R/W	Lamp test is always a flash approx. 200ms long. Select phase, and colour to flash. Optionally up to 4 outputs can be the same colour / phase and they can be checked using the Level parameter.
LPD	Loop Difference Value	Loop Detector 1 - 128	-	-	Difference 0 - 65535	Difference Class (optional) 0 - 65535	-	-	2 R/W	Difference value is the threshold for the sensitivity of the Loop. Smaller value is more sensitive. Below 20 the loop measurement will be unstable and will likely chatter.
LPP	Loop Presence (balancing) Time	Loop Detector 1 - 128	-	-	Time 0 - 255m	-	-	-	2 R/W	Time in minutes that a detection will tune out. For example if a vehicle parks on part of the loop.
LPF	Loop Frequency Settings	Loop Detector 1 - 128	-	-	0 or 1 Low or High Freq.	-	-	-	2 R/W	Sets the Frequency of the loop to be Low or High Frequency.
MIN	Minimum Green Time	Phase Letter A - CR	-	-	Time 0 - 255s	-	-	-	3 R/W	Minimum Green time for phase.

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
MMS	Manual Mode Status	-	-	-	1 – Enable 0 - Disable	-	-	-	3 R/W	If configured, this will need to be set to enable the Manual Mode button.
MOD	Mode Status	Stream 1 - 8	-	-	Mode Text Form	-	-	-	1 R/O	This tells user what control mode each stream is operating.
MXX	VA Maximum Green Time	VA Max Set 1 - 8	Phase Letter A – CR	-	Time 0 - 255s	-	-	-	3 R/W	VA Maximum Green time. Related to PTX (Pre-Timed Max maximum green) and FVX (Fixed Vehicle Period). See also VMT (Max Green Type).
ONX	On-Crossing Extension	Detector Logic Number 1 – 200	-	-	Time 0.1 - 25.5	-	-	-	2 R/W	Any detection linked to a pedestrian phase using On-Crossing Detection will show up, so Shift + to the On-Crossing of interest. Min Value 0.1s.
OPD	Display Digital Output	Starting Output 1-128	-	-	-	-	-	-	1 R/O	View the status of digital outputs, in blocks of 16. Currently not a live view, but a snapshot.
OPS	Output State	Starting Output 1-128	-	-	Mode 0-3	-	-	-	2 R/O	This parameter acts as a filter after the firmware sets the output state. 0: Not Forced 1: Forced ON 2: Forced OFF 3: Force Pulse
PAI	Priority Associated Inhibits	Priority Unit 1 - 16	-	-	List of Priority Units inhibited	-	-	-	- R/O	Shows which Priority Units are inhibited by the indexed Priority unit.
PAR	Pedestrian All Red	0 – Gap 1 – Max	Phase Letter A – CR	-	Time 0 – 255s	-	-	-	3 R/W	For Gap and Max times only phase letter is required to index the value. However for the mode related indices 2 and 3, there is an extra parameter which is a list of applying modes: FIXED, CLF, UTC, MAN, PRIO, MOVA, HURRY, LRT, PT.
		2 – FVP 3 – UTC	Phase Letter A – CR	Mode See Description	Time 0 – 255s					
PDD	Pedestrian Demand Delay	Phase Letter A – CR	-	-	Time 0, 1 or 2s	-	-	-	2 R/W	Delay after push button is pressed, that a demand is registered for the pedestrian phase. This value can be either 0, 1 or 2 seconds.
PDE	Pedestrian Demand Extension	Phase Letter A – CR	-	-	Time 0 – 5s	-	-	-	2 R/W	Kerbside Extension Time. This value can be in the range 0.1 to 5 seconds. The lower limit is to ensure correct operation of the Kerbsides.
PDH	Pedestrian Demand Hold	Phase Letter A – CR	-	-	Time 0 – 5s	-	-	-	2 R/W	The demand hold time can be in the range 0 to 5 seconds.

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
PFR	Pedestrian Final All Red Clearance	Phase Letter A – CR	-	-	Time 1 – 3s	-	-	-	3 R/W	Only available for Extendible Blackout Pedestrian phase type. Range is 1 to 3 seconds.
PGC	Pedestrian Gap Clearance	Phase Letter A – CR	-	-	Time 0 – 3s	-	-	-	3 R/W	TR2500 Period 8, only available for Extendible All Red Pedestrian phase type. Range is 0 to 3 seconds.
PHD	Phase Delays	?	?	?	?	?	?	?	2 R/W	#TODO operation of this command under review
PIC	Firmware version	-	-	-	-	-	-	-	1 R/O	Firmware Version, build, safety version and date.
PIT	Pelican Intergreen Time	Period 0 1 2	Phase Letter A - CR	-	Time 0 – 2s 6 – 8s 1 – 2s	-	-	-	3 R/W	Each period has different limits. An example command would be PIT 0 C=2 N/A will be returned if phase letter refers to wrong group type, i.e. not type 20.
PMC	Pedestrian Max Clearance	Phase Letter A - CR	-	-	Time 0 – 3s	-	-	-	3 R/W	TR2500 Period 7, runs only if Period 6 extends to maximum. Will only work for phase types 14 (extendable All Red) or 17 (extendable Blackout).
PMN	Pedestrian Minimum All Red Clearance	Phase Letter A - CR	-	-	Time 1 – 5s	-	-	-	3 R/W	TR2500 Period 5, Minimum All Red time. Will only work for phase types 14 or 17.
PMX	Pedestrian Maximum Extendible Clearance	Phase Letter A - CR	-	-	Time 0 – 25.5s	-	-	-	3 R/W	TR2500 Period 6, Max Extendible All Red or Blackout time. Will only work for phase types 14 or 17.
PRA	Phases Allowed by Priority Unit	Priority Unit 1 – 16	-	-	Phase Letter(s) A – CR	-	-	-	1 R/O	List phases allowed to run if demanded before Priority phase gets green for the Priority Unit specified.
PRC	Priority Compensation Time	Priority Unit 1 – 16	Timing Set 1 – 4	Comp. time 1 – 16	Time 0 – 255s	-	-	-	2 R/W	Compensation time after priority for Priority Unit and Timing Set specified.
PRE	Priority Extension Time	Priority Unit 1 – 16	Timing Set 1 – 4	-	Time 0 – 255s	-	-	-	2 R/W	Extension Time for Priority Unit and Timing Set specified
PRF	Phases Forced by Priority Unit	Priority Unit 1 – 16	-	-	Phase Letter(s) A – CR	-	-	-	1 R/O	List phases forced to run regardless of demands before Priority phase gets green for the Priority Unit specified.
PRI	Priority Unit Inhibit Time	Priority Unit 1 – 16	Timing Set 1 – 4	-	Time 0 – 255s	-	-	-	2 R/W	Inhibit Time for Priority Unit and Timing Set specified.

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
PRM	Priority Unit Maximum Time	Priority Unit 1 – 16	Timing Set 1 – 4	-	Time 0 – 255s	-	-	-	2 R/W	Maximum Time for Priority Unit and Timing Set specified.
PRS	Priority Unit Status	Priority Unit 1 – 16	-	-	-	-	-	-	1 R/O	This command will return three different values: ACTIVE, INACTIVE (not running, not inhibited), INHIBITED (not running and inhibited).
PTH	Part Time Hold	-	-	-	Time 0 – 255m	-	-	-	2 R/W	Minimum time in minutes that signals must be ON, when Part Time mode is used.
PTI	Part Time Inhibit	Stream 0 – 8	-	-	0 – OFF 1 – ON	-	-	-	2 R/W	Disable the use of Part Time mode. Signals will be ON. Stream 0 means all streams.
PTI	Part Time Prevent	-	-	-	Time 0 – 255m	-	-	-	2 R/W	Minimum time in minutes that signals must be OFF, when Part Time mode is used.
PTX	Pre-Timed VA Maximum Green Time	VA Max Set 1 – 8	Phase Letter A – CR	-	Time 0 – 255s	-	-	-	3 R/W	Pre-Timed VA Maximum Green time. Related to MXX (VA Max maximum green) and FVX (Fixed Vehicle Period). See also VMT (Max Green Type).
PWN	Phase Window Duration	Phase Letter A – CR	-	-	Time 0 – 255s	-	-	-	2 R/W	Window time for allowing a phase to get green in a stage when demanded. Used with phase appearance type 3.
RDF	Reset Detector Faults	Detector Logic 1 – 200	-	-	-	-	-	-	2 R/W	Resets Detector Faults. Only detectors that have seen a change of input state will be reset.
RFL	Reset Fault Log	-	-	-	1	-	-	-	3 R/W	Reset Fault Log – to use type $RFL=1$.
RMX	All Red Extension Maximum Duration	Stream 1 – 8	From Stage 0 – 15	To Stage 0 – 15	Time 0 – 255	-	-	-	2 R/W	Maximum time any All Red Extension Unit can extend the All Red period.
RSC	Regulatory Sign Monitor Re-Calibrate	Channel 1 – 16	-	-	-	-	-	-	3 R/W	Relearn the lamp loads for the Regulation signs. Can recalibrate by channel, or if no channel selected, recalibrate all channels in sequence with SHIFT +
RSI	Regulatory Sign Monitor Information	Channel 1 – 16	-	-	Number of Lamps 0 – 255	Power (W) 0 – 6553.5	-	-	1 R/O	Display the number of lamps configured and the measured power for a Regulatory sign channel. SHIFT + to skip through the configured channels.
RSL	Regulatory Sign Monitor Lamp Profile	Channel 1 – 16	-	-	Lamp Profile 1 – 16	-	-	-	3 R/W	Display or alter the lamp profile in use with the selected Regulatory Sign Channel.
RXD	Red Extension Duration	Stream 1 – 8	From Stage 0 – 15	To Stage 0 – 15	Time 0 – 25.5s	-	-	-	2 R/W	Extension time for All Red Extension Unit

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
SAT	Speed Assessor Type	Special Detector No. 1 – 24	-	-	Type	-	-	-	4 R/O	Speed Assessor Type: DSD – Double SDE TSDO – Triple SDE Outer TSDI – Triple SDE Inner SA – Speed Assessment
SFL	Software Flags	Standard 1 – 255 Extended 301 – 940	-	-	-	-	-	-	1 R/O	View Software flags. Standard flags may be used in special conditioning, whereas extended flags are related to UTC control and reply bits. See Controller manual for more information.
SOO	Signals ON/OFF by Stream	Stream 1 – 8	-	-	0 – OFF 1 – ON	-	-	-	3 R/W	Turns the Signals ON or OFF. Local command only. Will not function via remote terminal.
TAL	Timetable Action List	Action List 1 – 16	Action 1 - 8	-	TCF	CLF Plan 1 – 16	-	-	2 R/W	Timetable Action – Introduce CLF Plan
					TPT	Stream No 1 – 8	0 – OFF 1 – ON	-		Timetable Action – Activate [1] or Deactivate [0] Standby in Selected Stream.
					TSF	Soft Flag 201-250	0 – OFF 1 – ON	-		Timetable Action – Activate [1] or Deactivate [0] selected soft flag.
					TSI	Stream 1 – 8	Stage 0 – 16	0 – OFF 1 – ON		Timetable Action – Inhibit [1] or Clear Inhibit [0] of selected stage in selected stream.
					TGI	Phase Letter A - CR	0 – OFF 1 – ON	-		Timetable Action – Disable Phase [1] or Re-Enable Phase [0].
					TFD	Detector Logic No. 1 – 200	2 – Normal 0 – OFF 1 – ON	-		Timetable Action – Force Specified Detector Logic. Forced OFF [0] Forced ON [1] and Normal Operation [2]
					TAS	Action List Number 1 – 16	-	-		Timetable Action – Execute Specified Action Table List
					NOP	-	-	-		Timetable Action – No Operation. Note that an action table list ends with a blank entry. NOP can be used to blank an action when more follow on.
TOD	Time and Date	-	-	-	HH:MM:SS YYYY-MM-DD	-	-	1 R/W	Can set either the time or the date. Time in 24hr format. Separate with colon. Date format YYYY-MM-DD separate with hyphen.	

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description	
TTT	Time Table Inspection Tables	Table Number 1 – 32	-	-	Table Name (not impl)	Priority 0 – 8	Date or Date Range (from – to)	Days – 3 letter code	2 R/O	If entered without Index 2, this becomes a read only instruction and gives all information in one line.	
		Table Number 1 – 32	N P D	Name (16) Prio (1-8) Day	-	-	-	2	2 R/W	TTT can write using the appropriate switch in Index 2. Separate the three letter day codes with a comma. MON, TUE, WED, THU, FRI, SAT, SUN	
TTI	Time Table Inspection instructions	Table Number 1 – 32	Instruction	Time HH:MM:SS	Mnemonic	Mnemonic	Mnemonic	2	2 R/O	This command uses the same Mnemonic structure as the TAL command. This part is read only with all info on one line.	
		Table Number 1 – 32	Instruction	T Time	Time HH:MM:SS	-	-	-	2 R/W	Sets the time that an event occurs in the timetable. Separate with colons.	
		Table Number 1 – 32	Instruction	M Mnemonic	TCF	CLF Plan 1 – 16	-	-	-	2 R/W	Timetable Action – Introduce CLF Plan
					TPT	Stream No 1 – 8	0 – OFF 1 – ON	-	-		Timetable Action – Activate [1] or Deactivate [0] Standby in Selected Stream.
					TSF	Soft Flag 201-250	0 – OFF 1 – ON	-	-		Timetable Action – Activate [1] or Deactivate [0] selected soft flag.
					TSI	Stream 1 – 8	Stage 0 – 16	0 – OFF 1 – ON	-		Timetable Action – Inhibit [1] or Clear Inhibit [0] of selected stage in selected stream.
					TGI	Phase Letter A - CR	0 – OFF 1 – ON	-	-		Timetable Action – Disable Phase [1] or Re-Enable Phase [0].
					TFD	Detector Logic No. 1 – 200	2 – Normal 0 – OFF 1 – ON	-	-		Timetable Action – Force Specified Detector Logic. Forced OFF [0] Forced ON [1] and Normal Operation [2]
					TAS	Action List Number 1 – 16	-	-	-		Timetable Action – Execute Specified Action Table List
NOP	-	-	-	-	Timetable Action – No Operation. Note that an action table list ends with a blank entry. NOP can be used to blank an action when more follow on.						
TSS	Max Set Selected	-	-	-	Max Set 0 – 8	-	-	-	1 R/O	Shows which alternative maximum green set is running. Zero indicates alternative maximum greens are not being used.	

Command	Name	Index 1	Index 2	Index 3	P1	P2	P3	P4	Level R/W	Description
TSD	Timetable Annual Tables	Year Column 1 – 11	Row 1 – 32	-	Date Output (see description)	-	-	-	1 R/O	This displays any years programmed with special dates. The dates will be prefixed with start or stop to indicate the beginning and end of special date ranges.
UTO	UTC Force bit Time Out	UTC Bit Type	-	-	Time 0 – 255 x10s	-	-	-	2 R/W	This displays the timeout in 10s resolution. A value of 20 would be 200s. Options for index 1 are: F, GO, TO, LL, and PV.
VMT	VA Maximum Green Type	Phase Letter A – CR	-	-	Mode 0 – 3	-	-	-	3 R/W	VA Maximum Green type modes are: 0 – Not used 1 – Standard VA 2 – Pre-Timed Maximum VA 3 – Fixed Vehicle Period
WID	Handset Display Width	-	-	-	Characters 14 – 80	-	-	-	1 R/W	The default handset display width is 20 characters for compatibility with terminal readers.

4 CLF Commands in More Detail

4.1 CLI Command for Influence, stage and time/action instruction

To examine a CLF influence instruction, type in `CLI_1_1` for first CLF plan, first instruction. Note the `_` denotes a space between CLI and the two numbers. The first index is CLF plan number; the second index is the instruction index.

In the following examples the `_` symbol is used to indicate where the user is to type a space.

The following table gives the influence codes currently in use.

Table 6 – CLF Influences

Name	Example Code	Description
IM	06r-00s-ttt	Immediate move to stage <i>s</i> in stream <i>r</i> at time <i>ttt</i> seconds.
DD	07r-00s-ttt	Demand Dependent move to stage <i>s</i> in stream <i>r</i> at time <i>ttt</i> seconds.
HS	049-00r-ttt	Hold Current Stage in Stream <i>r</i> at time <i>ttt</i> seconds.
PX	04r-00s-ttt	Prevent All moves except to stage <i>s</i> in stream <i>r</i> at time <i>ttt</i> seconds.
VA	050-00r-ttt	Isolate stream <i>r</i> to VA at <i>ttt</i> seconds
EA	101-03-iii	When action input <i>iii</i> is active, execute next action
SA	101-01-iii	When action table input <i>iii</i> is active, skip next action
NO	001-00-000	No operation command. If a command in the middle of a table needs to be erased, and there are further instructions to follow use this not the erase command.
??	000-00-000	Read only, means End of Table. For example <code>CLI_1_7=0</code> would insert this into instruction 7 of CLF plan 1.

Example with Immediate Move:

`CLI_2_1` will return something like:

```
CLI 2 1: IM 1 1 0
```

Which is Immediate Move, **stream 1**, **stage 1** time **0s**.

To edit the first line of this CLF plan to make the time 10s, type in:

```
CLI 2_1=IM_1_1_10
```

Which would be **IM** Stream **1**, Stage **1** time **10**.

Please note that there is no space between the **I** and **M** but there is between everything else. The controller will return:

```
CLI 2 1:IM 1 1 10
```

Erasing a CLF instruction

To wipe out an action i.e. completely erase it, simply select the plan and instruction number and make it equal to zero. **All action table instructions after this will be ignored.** The CLF plan reads instructions up to the first blank entry. For example, to wipe out action table 3 instruction 4, the user would type:

```
CLI_3_4=0
```

The controller will return:

```
CLI 3 4:OK
```

Erasing a CLF instruction that is not the last one in the plan

Erasing a CLF instruction in the middle of the CLF plan would result in the plan stopping at that point. So if a CLF instruction needs to be removed, allowing the plan to continue past this point, the **No Operation Instruction** needs to be used. This is mnemonic **NO**. To apply this, simply type **CLI** followed by the plan number and instruction number, making it equal to **NO**. For example to blank out CLF plan 3 instruction 4 use:

```
CLI_3_4=NO
```

2.5.2 CLA Command for Setting up Action Table Inputs

The **EA** and **SA** CLF instructions require a special action table input to activate them, otherwise they will not work. The action table input number is stored in a table accessible using the **CLA** command. When using the **EA** and **SA** CLF instructions, substitute the instruction time for action table input.

The action table input is made up of three parts, type, mode and input. **Type** is restricted to software or hardware input types. **Mode** refers to the state of the input used. It can be Forced OFF, Forced ON, Normal or Inverted. The **input** number can be in the range 0 to 65535 although in practice, even with the extended UTMC software flags, this number will not be higher than 940.

CLA 1 will return the first action table input:

```
CLA 1:Soft Norm 00255
```

END OF DOCUMENT