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TRAFFIC DIRECTORATE

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The Retrofit Installation of Pedestrian Countdown at Traffic Signals

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1. **SCOPE**

- 1.1 This document outlines the procedure for the installation of Pedestrian Countdown Signals at Traffic junctions. This specifically deals with the installation of side-by-side countdown and Green Man signals.

2. **DEFINITIONS**

- 2.1 **TD** shall mean Transport *for* London - Traffic Directorate.
- 2.2 **DfT** shall mean the Department for Transport
- 2.3 **PROJECT ENGINEER** shall mean TD authorised personnel and/or representative.
- 2.4 The **AUTHORITY** means Transport *for* London or its successors and permitted assigns.
- 2.5 The **INSTALLATION CONTRACTOR** means the person or person's firm or company whose tender has been accepted by the principal and includes the installation contractor's personal representatives successors and permitted assigns.
- 2.6 The **WORKS** means the installation work materials, articles and services as described or mentioned in the tender document.
- 2.7 The **AGENT** means the person or persons firm or company who has been appointed to represent the AUTHORITY in all matters connected with specific aspects of the work.
- 2.8 The **HIGHWAY AUTHORITY** is the London Borough or Transport for London.
- 2.9 The **SITE** means the place where the works are undertaken.
- 2.10 The **PRINCIPAL** means the body person or persons firm or company placing the contract for the works.
- 2.11 The **SIGNAL CONTRACTOR** means the contractor having registration to the Standard Industrial Classification 3433 of BS EN ISO 9002 and approved by the AUTHORITY for work in London.
- 2.12 **PCaTS** shall mean Pedestrian Countdown at Traffic Signals and shall refer to the countdown display equipment.

3. **REFERENCE DOCUMENTS**

- | | | |
|-----|----------|---|
| 3.1 | TTS1 | Controller Installation and Commissioning Specification |
| 3.2 | TTS6 | Design Standards for Signal Schemes in London |
| 3.3 | TCSU8 | Specification for the Installation of Traffic Signals and Associated Equipment |
| 3.4 | HGU92105 | Safety at Street Works and Road Works: A Code of Practice |
| 3.5 | TA 14/81 | Procedures for the installation of Traffic Signals and Associated Control Equipment |

4. **HEALTH AND SAFETY**

- 4.1 The Installation Contractor shall before undertaking any work consult with the principal to ensure that the appropriate notifications have been issued to the Highway Authority or that the Highway Authority has issued notices if the works are being carried out on their behalf.
- 4.2 Installation Contractors shall comply with the requirements of the New Roads and Street Works Act (NRSWA) and ensure that barriers or cones protect the works and public as necessary.
- 4.3 All installation Contractors shall have BS EN ISO 9002: 1994 registration.
- 4.4 All installation work carried out on site shall comply with the following:
- a) G39 Model code of Practice covering Electrical Safety
 - b) Health and Safety at Work Act 1974
 - c) Chapter 8 of the Department for Transport Traffic Signs Manual
 - d) Construction (Design and Management) Regulations 1994
 - e) The Electricity at Work Regulations 1989
 - f) NRSWA 1991 and associated codes of practice
 - g) Construction Products Directive 1991 – Essential Requirements

5. **DESIGN**

5.1 The PCaTS unit is design to display the time remaining to cross during the traditional pedestrian blackout period.

The PCaTS unit is “self-learning”, meaning it derives its timings directly form the Red Man \ Green Man aspects.

The PCaTS unit provides a monitoring feedback line to the controller to report faults.

The Countdown unit is self contained and requires only 7 cores for connection. 3 x LV and 4 x ELV as below:

- Brown – for incoming Red Man
- Green – for incoming Green man
- Blue - for signals neutral line
- Red – for 48v DC power line
- Black – for 0v DC common line
- White – Monitoring Feedback Line
- Yellow – Monitoring Line Return

5.2 The PCaTS unit is designed to sit side-by-side with the Green Man in the same configuration as a Toucan signal.

Where possible the unit should be positioned to the right of the Green Man.

6. System Diagram

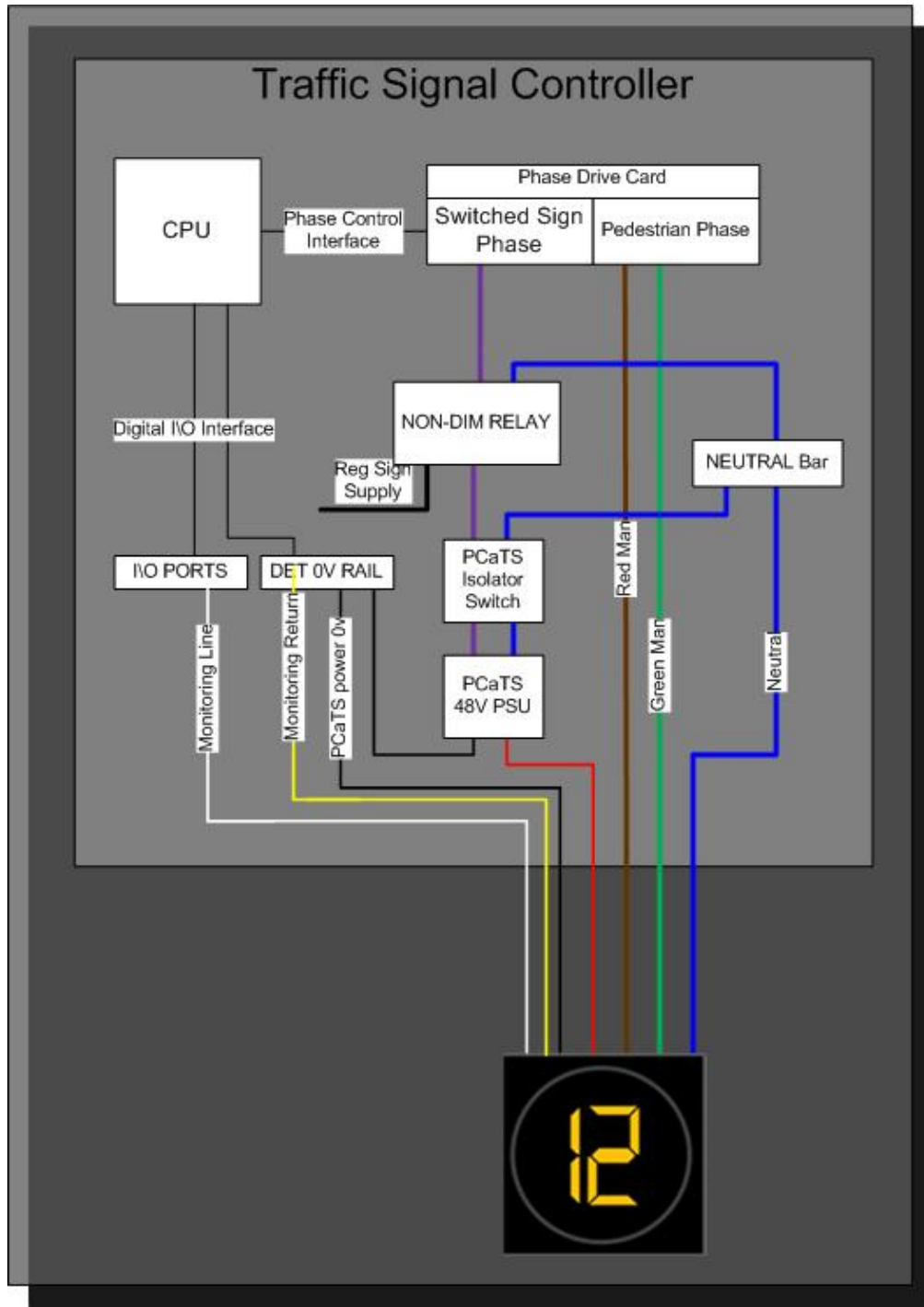


Figure 1 - System wiring Schematic

7. INSTALLATION

All installation works shall be carried out with the signals off. This should be done by the Master power switch in the controller cabinet to isolate the controller.

7.1 **Cabinet Equipment Works**

7.1.1 PROM

For the correct running of the PCaTS unit a new PROM is required to enable a number of functions. These include:

- Secret Sign phase to power the units
- Increase I/O ports (either accommodate new physical i/o or enable existing) for PCaTS monitoring line
- Special Conditioning to handle IO and report faults on UTC

The PROM should be installed in line with Existing Procedures.

7.1.2 Non-Dim Kit

The additional secret sign phase will power a non-dim kit relay which ensures that a permanent 230vac supply is fed to the PCaTS power supply, regardless of whether the signals are dimmed. This is a Siemens supplied kit and should be fitted as per the instructions available separately (*'non dim relay wiring diagram.pdf'*).

The permanent supply feed will need to be determined on a site-by-site basis to ensure that appropriate fusing and discrimination is kept.

7.1.3 Power Supply

The power supply for the PCaTS unit is 48vdc and should be supplied and installed on DIN rail.

If there are no free terminal blocks available then additional blocks should be installed onto spare DIN rail space.

The 0v output of the PSU should be connected to the controller 0v rail (to allow monitoring line to be referenced).

A PCaTS master switch will be installed between the Non Dim Kit and the PSU to allow the disabling of ALL PCaTS units on site (killing power). This switch should be a DIN rail mounted switch.

The incoming power should be routed from the reg sign supply, where there are no box\secret signs on site, otherwise a separate fused way should be provided on site. This will be indicated by the Electrical Design Team.

7.1.4 I/O Boards

Where the existing PROM does not have sufficient spare input ports new I/O card may need to be installed.

The Controller Spec shall define where the new I/O board should be terminated.

Where new wiring looms are required they should be routed neatly and along the existing wiring loom route.

The new board should be fitted and properly addressed in the controller swing frame.

7.1.5 Phase Drive

Where the requirement for an additional secret sign phase takes the total number of phases beyond those available with the current phase drive cards a new one may be required.

This should be installed and wired as per the controller specification. All wiring should follow established cable routes.

7.2 Pole Works

The pole works should be carried out in a particular order. Referencing the Cable schematic for the site the pole works should be carried in the order of the cable runs. i.e. where an ELV run is controller to pole1 to pole2 to pole3 to pole4. The works should be carried out in the same order. This allows correct looping through of ELV cores for Power and monitoring lines.

The Signal Contractor should consider the requirements for Traffic Management for each pole install including the requirement to close a lane if required.

Whilst pole works are being undertaken the associated pedestrian crossing should be closed to allow safe working.

The following steps should be followed for EACH polePCaTS unit

7.2.1 Box Sign Housing

The PCaTS unit is supplied with a modular housing. Specific brackets are supplied with for fitting both the newer modular signal heads (Peek Elite \ Siemens Helios etc...) and the older 300mm style (Mellor \ Plessey etc...)

In line with the DfT's approval of Pedestrian Countdown the housing **must** be installed alongside the Green Man aspect, preferably to the right (same as a toucan configuration). See Appendix 1.

The housing should be fitted in line with the manufacturer's instructions.

7.2.2 Fly-Lead

The PCaTS unit comes with a 2.5m fly-lead with a waterproof multi-pin connector on one side and a 7-core free wire at the other end.

The fly-lead needs to be routed from the PCaTS housing through the Green Man and then Red Man housings, out the Kopex and into the pole cap for termination.

- Starting from the PCaTS housing end feed the bare wire end through the conduit into the Green Man housing.
- Pass the cable up into the Red Man housing.
- Free the end of the Kopex from the Pole top.
- Feed the fly-lead through the Kopex until it protrudes out the Kopex.
- Pull through sufficient slack to enable the cable to reach the pole cap.
- Feed the fly-lead into the hole in the pole top and up to the pole cap assembly.
- Split the LV and ELV cores inside the fly-lead sufficiently to reach the top of the pole cap.
- Secure the fly-lead to the pole cap assembly using cable ties

7.2.3

Terminating Cores

There are multiple sets of pole cap wiring required:

1. ELV for PCaTS

There are 4 ELV connections from each PCaTS unit: 48v, 0v and Monitoring line

- Connect the Black Wire to a spare ELV terminal (0v)
- Connect the Red Wire to a spare ELV terminal (48v)
- Connect the White Wire to a spare ELV terminal (Mon Line)
- Connect the Yellow Wire to the same ELV terminal as the 0v above (Mon Line Return)

2. Connect Spare cores

Connect 3 appropriate ELV cores from the incoming ELV cable to the above three cores installed.

For each subsequent PCaTS unit on the cable run connect 1 additional EL core. i.e. for 2 subsequent PCaTS on a run wire in 3+2 =5 cores, this is for the monitoring line

3. Loop through ELV cores on cable run

Subsequent PCaTS units will require power and monitoring lines to be looped through to the next pole on the cable run.

For each ELV core wired above (minus the one used for this monitoring line) connect a core off the outgoing ELV cable.

Following this Methodology as you reach the final PCaTS on a cable run the number of looped through cores should be 3 (2x power and 1x monitoring line)

4. LV for PCaTS

There are 3 LV connections for the PCaTS unit: Red Man, Green Man and Neutral

- Connect the Brown Wire to a the Red Man LV terminal for this Ped Head
- Connect the Green Wire to a the Green Man LV terminal for this Ped Head
- Connect the Blue Wire to a the Neutral LV terminal

The LV PCaTS cores should be appropriately tagged using the red LV tags and the cores numbered.

5. Fit the warning label at the pole cap.

7.2.4

Fit PCaTS to housing

The PCaTS units will be supplied fitted to the door and should then be fitted to the PCaTS housing on the pole.

Connect the fly-lead connector to the PCaTS unit.

7.3 Cabinet Wiring Works

Once the Cabinet Equipment and PCaTS units are installed the final stage is to connect the incoming spare ELV cores for power and monitoring lines.

7.3.1 Monitoring Line

There will be one monitoring line (ELV core) per PCaTS unit.

These should be wired into the appropriate controller input terminals as detailed in the controller spec.

7.3.2 Power Supply

For each cable run there will be two incoming power lines (ELV cores). The 48v DC cores should be appropriately terminated in the PCaTS Power supply terminal block and the 0v cores in the standard 0v terminal blocks, taking care to ensure polarity is preserved.

7.4 System power on

Once all the installation components are complete the following switch on procedure should be followed:

- Switch On Traffic Controller
- Turn on PCaTS PSU Switch

The PCaTS units will take between 3-4 cycles before displaying dependant on controller type. After this a visual inspection should be carried out to ensure all PCaTS units are displaying during the pedestrian blackout period. All units shall display the same timings and start and end together.

Following this the PCaTS, UTC and PROM commissioning process shall be carried out.

8. **PCaTS Install Picture Guide**

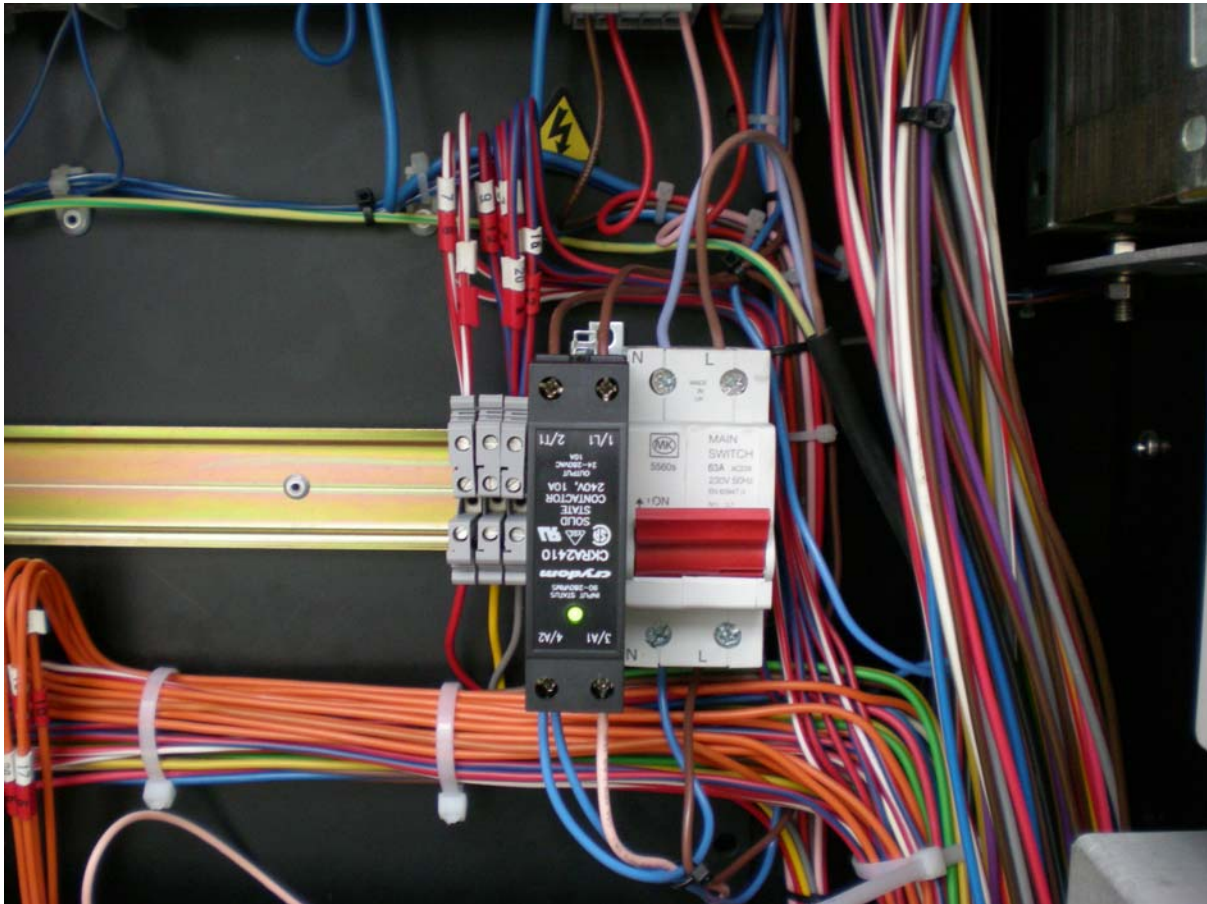


Figure 2 - Non-dim Kit and Isolator installed on DIN Rail

Appendix 1 – DfT Approval Diagram

