

SIEMENS ST700/ST750 HELIOS CLS NLM RETROFIT INSTALLATION NOTE

WARNING – ONLY TRAINED AND COMPETENT PERSONNEL SHOULD ATTEMPT TO UNDERTAKE THIS INSTALLATION.

Installation should only be carried out by persons who are adequately trained, have a full understanding of the needs of the county or region where the controller is to be used and are experienced in the tasks to be undertaken.

This note is intended to act as a reminder only. Full details of the installation procedure may be found in the Handbook Supplement for Monitoring Helios CLS (NLM) Signals 667/HB/32921/007. Installation engineers must first consult that handbook supplement and ensure that they are fully familiar with its content before undertaking installation. Note: it is recommended that individual ground returns are used for each green signal. Refer to Traffic Signal Junction Cabling Design Certification 667/DS/20664/000 for more info

OVERVIEW: The ST700/ST750 Helios CLS NLM Retrofit is a kit designed to upgrade an existing ST700/ST750 Site to incorporate Helios CLS (NLM) LED Traffic Signals. This Retrofit Kit is available in both HELIOS and PEEK ELITE bodies.

EQUIPMENT

- 667/1/32755/7nn ST700 or ST750 Retrofit kit
- 667/1/31500/ETC CLS NLM Door Kit(s)
- 667/1/27002/002 UK Lamp Switch Kit(s)
- 667/1/27002/102 Non-UK Lamp Switch Kit(s)
- 667/1/33540/ETC Peek Elite Retrofit CLS NLM Door Kit(s)

TOOLS REQUIRED

- 'T' Key
- Side Cutters
- Medium crosshead screwdriver
- Cabinet Access key
- Handset
- Firmware PROM Extractor Tool
- M3 Nut Spinner (5mm Socket)
- 2.5 A/F Small Allen Key (PEEK only)

UPGRADE PROCEDURE

Before starting, consider using IC4 View Differences to extract any changes to the controller's configuration data before changing the Firmware or Configuration PROM.

1. Switch Off the mains power at the Master Switch. Lock this switch in the OFF position and confirm the supply is isolated.
2. Upgrade the traffic signals, taking care to ensure that the door seals are fully compressed before locking hinges.

After upgrading the signals, if any changes are made to the earth connections, 'Minor Works' electrical testing as required in 667/HE/20664/000 must be completed.

3. Remove or bypass the 230/48V Wait transformers.
4. Remove external lamp monitoring sensors for additional vehicle RLM channels and Pedestrian Red/Green signals.
5. Replace the Phase Driver PCB as detailed overleaf.
6. Upgrade the Firmware PROM, ST700 needs 667/TZ/12800/000 "PB800" issue 27 or later, and ST750 needs 667/TZ/12801/000 "PB801" issue 11 or later.
7. If necessary, change configuration PROM. Confirm that the configuration has been generated by a competent person in accordance with the required procedures in place for the county and region.

NOTE: A site can usually be upgraded to LV CLS without changing the configuration PROM; it depends on the signals types and monitoring required.

8. Switch the signals to OFF using the Signals On/Off switch on the manual panel and Power on.
9. Download the IC4 configuration into the CPU PCB, and customise it using the handset mnemonics detailed in the Special Instructions. Follow usual configuration procedures.
10. Make any adjustments to the controller's timings and settings identified by IC4 View Differences, and marked up on the IC4 Printout in the controller cabinet.

11. If the KLV value is zero, select the applicable KLV value: If Siemens/Dialight Helios CLS signals are fitted, use KLV=3 (no far-side peds) or KLV=4 (far-side peds). If Siemens/Futurit Helios CLS signals are fitted, use KLV=5 (no far-side peds) or KLV=6 (far-side peds).
12. Review and if necessary correct the KLT settings for ALL the sensors (see KLT table below/right).
13. Enter KLR=1 to reset the lamp monitor.
14. Enter RFL=1 and Power off/on to clear the FLF 2:10 fault and illuminate the traffic signals.
15. Measure the actual bright lamp supply. If this differs from the value displayed by the handset command KEV, enter the correct value, e.g. KEV=239 to calibrate the controller's reading.
16. Check the dim lamp supply voltage;
 - Measure the actual dim voltage and check that it is no higher than 160V. If dim voltage is higher, move the input to the next higher tap, e.g. from the 230V input tap to the 240V input tap.
 - If the dim voltage is still higher than 160V, then the 140V tap can be used to reduce the dimming voltage further.
 - Use of the 120V tap is not supported with 'Helios CLS (NLM)' signals.
17. If any changes are made to the transformer connections; enter KLR=1 to reset the lamp monitor and re-learn the loads.
18. Check lamp monitoring learning;
 - Detailed in Controller Handset Handbook (/HH/)
 - Check using the KEL handset command that the number of watts learnt equates to the correct number of signals fitted; 'Helios CLS (NLM)' consume between 10W and 15W.

NOTE: The KES and KEL handset commands will show 0mA and 0W respectively for 'Red,Wt' if Helios CLS are fitted; monitoring is disabled while the Waits are illuminated.

19. Upgrade Complete. Follow usual commissioning procedures for completion of site installation.

KLV : <Lamp Supply Voltage Type: 0 to 4>

The configured Lamp Supply Voltage Type.

Value	Description
KLV:0	200-240V (original lamp types)
KLV:1	100-120V (original lamp types)
KLV:2	48V (ST900ELV & ST750ELV only)
KLV=3	230V Siemens/Dialight CLS Traffic / Ped monitor disabled
KLV=4	230V Siemens/Dialight CLS Traffic and Ped
KLV=5	230V Siemens/Futurit CLS Traffic / Ped monitor disabled
KLV=6	230V Siemens/Futurit CLS Traffic and Ped

Note – Nearside Ped & Demand cannot be monitored – use KLV=3

KLT <Sensor 1 to 48> : <Load type 0 to 255>

Load Type for each lamp monitor sensor.

KLT Signal Types	
0	Monitoring Disabled
1	Siemens/Dialight Helios CLS (NLM) (typically in signals supplied without LMF units)
10	Siemens/Futurit Helios CLS with LMF removed (typically in signals originally supplied with LMF units)
255	Original Lamp Types – Includes incandescent lamps, 'Helios LED', 'Helios CLS+LMF' and fluorescent tubes.

* Not applicable to Traffic RAG or PED R/G Signals

POWER/PHASE ASSEMBLY REMOVAL AND RE-FITTING, INCLUDING PHASE DRIVER PCB REPLACEMENT

Important Note! Dangerous voltages may be present inside the Power/Phase assembly. Ensure that the mains supply is isolated at the Master Switch before commencing the fitting process.

1. Isolate the Mains to the ST750 at the master switch.
2. Disconnect the 64-way Phase Control ribbon cable and other cables from the CPU.
3. Unclip the earth lead from the hinged front plate.
4. Remove the front plate holding the CPU (and I/O or OTU) and store carefully.
5. Disconnect the earth wires from the fixing point in the assembly.
6. Disconnect PL6, PL7, and SK2.
Warning Care must be exercised when removing or inserting the green connectors and their cables from the PCB, as strong extraction and insertion forces are required. Be careful not to over flex the board, which could cause tracks to fracture and the board to fail.
7. Disconnect PL1 and SK1.
8. Using a medium crosshead screwdriver, loosen (do not remove) the four screws holding the Power/Phase assembly to the equipment mounting plate. Lift the assembly off the mounting plate.
9. Replace the Phase Drive PCB, as detailed below, checking that the end part numbers are the same, i.e. /002 for 2-phase, and /004 for 4-phase.
10. Undo the EMC Filter fixings (M5 stainless screw, shakeproof washer and nut), so the EMC Filter is free to move.
11. Remove the Mains Live/Neutral connections to and from the EMC Filter and Switch.
12. Remove the M3 Hex Spacers that retain the Phase Driver PCB.
13. Lift out the Phase Driver PCB, noting that it has to disengage PL1 and SK1.
14. Cut the tie wraps holding the PSU cables, and unplug the cables from PL2.
15. Remove the PSU from the nylon PCB supports.
16. Fit the new nylon PCB supports to the new Phase Driver PCB.
17. Fit the PSU onto the new Phase Driver PCB.
18. Plug the PSU cables into PL2, and tie wrap the cables to the Heatsink/Cover.
19. Fit the Phase Driver PCB into the Power/Phase assembly.

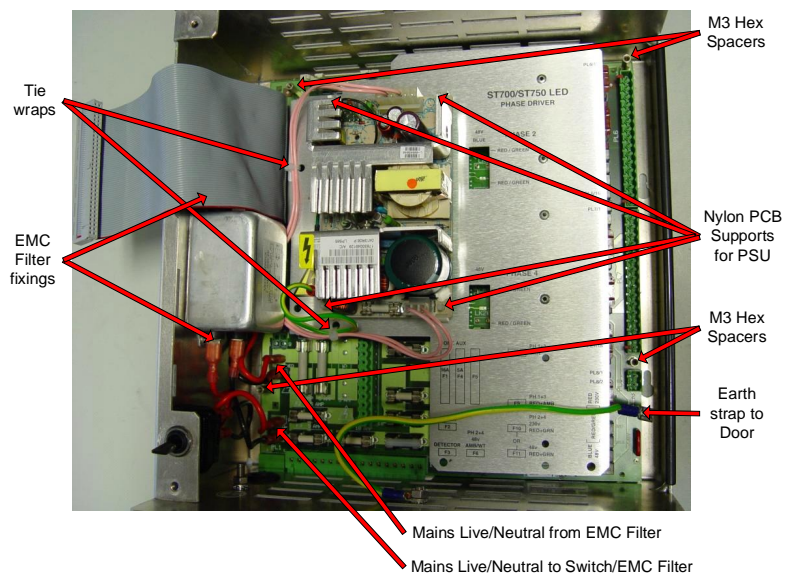
Notes:

1. When upgrading to LED Signals, it is recommended that individual neutral returns are used for each green signal if spare cores are available. Refer to Traffic Signal Junction Cabling Design Certification document 667/DS/20664/000 for more information.
2. It is recommended that the WID handset command is used to assist Installation and Commissioning.
3. Traffic Solutions, Siemens Mobility want to assist in the Retrofit process, and have therefore introduced the option of a basic 'Biscuit Tin', 667/1/27870/799, so that Depots can purchase one or two basic 'Biscuit Tin' units, and use them to prepare 'Biscuit Tins' with new Phase Driver PCBs for subsequent site installation. The basic 'Biscuit Tin' includes the Toggle Switch and EMC Filter with associated wiring, and fixings required for the new Phase Driver PCB.

20. Fit the M3 Hex Spacers to retain the Phase Driver PCB.
21. Re-fit the Mains Live/Neutral connections to and from the EMC Filter and Switch, being very careful to fit them correctly with respect to polarity and Filter input/output, as shown below.

Fast-on Tag	Wire Connection
TAG1	Mains Live from EMC Filter Output (Load)
TAG2	Mains Neutral from EMC Filter Output (Load)
TAG3	Mains Live to Switch
TAG4	Mains Neutral to EMC Filter Input (Line)

22. Secure the EMC Filter using the fixings (M5 stainless screw, shakeproof washer and nut).
23. Ensure that all Phase Driver links and fuses are set correctly (i.e. in the same position as the original unit), noting that Wait links and fuses are not present on the new Phase Driver PCB.
24. Reconnect PL1, PL6, PL7, SK1, SK2 and the earth wires.
25. Replace the hinged front plate holding the CPU PCB and, if fitted, the I/O or OTU PCB.



26. Replace all the cables to the CPU. Clip the earth lead to the front plate
27. Restore power to the ST750.

Figure 1 – ST750 LED Phase Driver PCB in 'Biscuit Tin'

SUPPLY DETAILS

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