Telensa

Telecell Installation Manual

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Notices

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1 Introduction

1.1 Overview

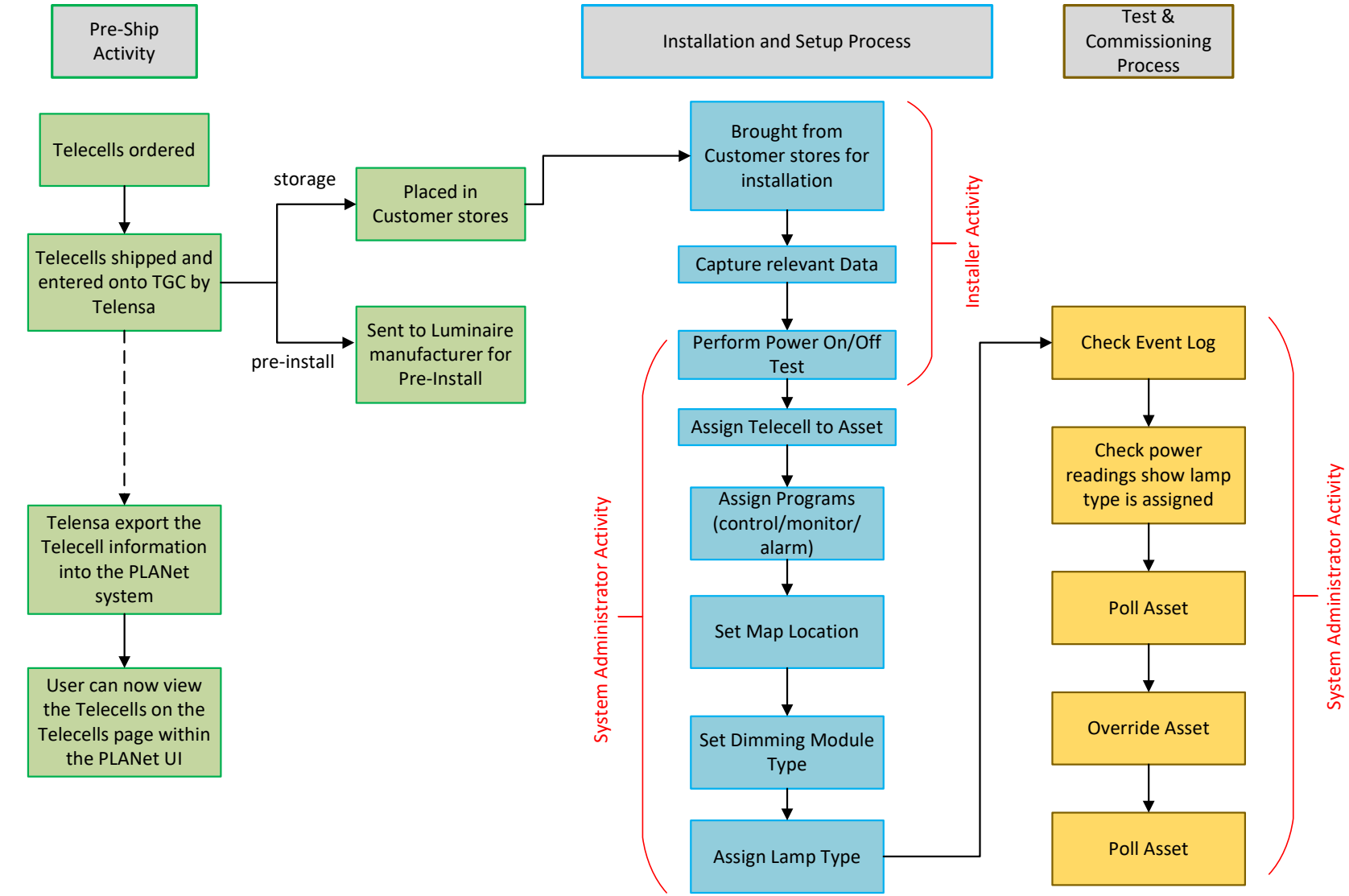
This manual covers the installation, test and commissioning guidelines for the Telensa Telecells.

The system must be configured correctly to allow PLANet to function fully. This guide serves as a tool to aid the installation of component parts, mainly the setup of the system so that reports and data returns are accurate.

This document details the installation of component parts, configuration of Assets and confirmatory checks.

Below is the Telecell Work Flow Diagram showing the following processes:

- Ordering
- Installation
- Test and Commission



Some activities may be performed by Telensa or Customer depending on the agreed contract

1.2 General Warnings and Cautions

This section provides safety and regulatory warnings, cautions and information for the Telecell and its internal components. Details of manufacturer's source documents are noted where they are used.

Installers must be suitably trained and qualified for electrical work, according to the laws and local codes for the locality and country where the unit will be installed. This unit must only be installed by personnel that have been trained by Telensa or their representatives to carry out this work.

The supply voltage present in the luminaire and its plug in locking type socket is hazardous and all necessary precautions must be taken to ensure the safety of the installer. Isolate the supply to the plug in locking type socket before removing an old photocontrol, and installing the Telecell.

The transmitter must not be co-located or operated with any other antenna or transmitter.

This equipment should be installed and operated with a minimum distance of 20cm from bystanders.

1.3 Packing and Handling Instructions

Telecells are electronic devises containing processors, a radio module and memory. Although encased in a robust outer shield, Telecells should be treated with care.

Dropping the Telecell from a height could cause irreparable damage.

Ensure that pins are protected, remaining in their original packaging and kept dry during transportation and installation.

If returned to Telensa, Telecells must be packaged to the same standard prior to shipping.

1.4 Telecell Regulatory Statements and Compliance Information

1.4.1 United States of America (FCC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Consult a dealer or an experienced radio/TV technician for help

Note that no changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment.

This transmitter must not be co-located or operated with any other antenna or transmitter

This device complies with Part 2.1091 of the FCC Rules for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Transmit Band: 902.0 – 928.0 MHz
Transmit Power: 20 dBm

1.4.2 Canada (IC)

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions: 1) This device may not cause interference; and 2) This device must accept any interference, including interference that may cause undesired operation of the device.

The radio transmitters (12199A-2TXD and 12199A-2NPD) have been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gains indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

This device is exempt from the standard RSS-102 RF exposure assessment requirements section 2.5.2. This equipment must be installed and operated with a minimum distance of 20 cm between the radiator and passers-by.

Déclaration de conformité Industrie Canada (IC)

Le présent appareil est conforme aux CNR d'Industrie Canada (IC) applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

1) l'appareil ne doit pas produire de brouillage;

2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Les émetteurs radio (12199A-2TXD and 12199A-2NPD) ont été approuvés par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous avec les gains maximaux admissibles indiqués. Les types d'antennes non inclus dans cette liste, ayant un gain supérieur au gain maximal indiqué pour ce type, sont strictement interdits pour une utilisation avec cet appareil.

Cet appareil est exempté des exigences habituelles d'évaluation de l'exposition RF de RSS-102, section 2.5.2. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et les passants.

Telensa Part Number	Isotropic Gain (dBi)
ANT-S-EF-M	2
ANT-S-TW-A	2
ANT-S-LP-A	0
ANT-S-HG-A	5

Transmit Band: 902.0 – 928.0 MHz

Transmit Power: 20 dBm

1.4.3 Europe (ETSI)

Essential requirements of Directive 2014/53/EU

Manufacturer: Telensa Limited, Iconix 3, CB22 3EG, UK

Transmit Band: 868.0 to 868.6 MHz

Transmit Power: 14 dBm ERP

1.5 Related Information

[TL-000762-ST]	System Glossary
[TL-005536-PR]	System Overview Manual
[TL-005716-PR]	PLANet User Guide

1.6 Terminology

PLANet	Public Lighting Active Network
GPS	Global Positioning System
OOS	Orphan Outstation
OSID	Outstation Identification Number
OS	Outstation
ROS	Relay Outstation

1.7 Essential information

1.7.1 Installer

At the point of installation, it is important to match the **Asset ID** to the **OSID**. The installer must confirm the correct operation of the Power On / DIM / Off test cycle as follows:

1) Turn **ON** the mains supply to the Telecell. The lamp will illuminate for **50 seconds**, then turn **OFF**. If the unit is fitted with a dimming unit it will illuminate for **50 seconds** but after approximately **25 seconds** it will **DIM** to approximately **50%.**

   Note: When powered up, the unit may switch **ON** then momentarily switch **OFF**, this operation is normal and is the Telecell auto-sensing between Analogue and DALI.

2) After **50 seconds** has elapsed the lamp will turn **OFF**.The test is now complete. There is an issue if the lamp fails to operate as described.

The Telecell is now scanning for Basestations and Relays to enable a connection to the Server.

After **15 minutes** the lamp will switch back **ON** if the Telecell has not connected to the Server (this can take a few hours), or has not received timing from its **GPS** (GPS variant only).

Once the Telecell **Connects** or receives **Timing,** it will start operating to a **photocell** style programme.

1.7.2 Administrator

- A Customer System Administrator will complete the import, asset set up and commissioning phase.

1.7.3 Pre-Provisioning

- Ensure Telecells are loaded onto PLANet.

1.7.4 Power Requirements

ALERT: Report any safety or installation maintenance issues to the installation project manager to schedule a repair.

1.8 Recording Telecell Identity at Installation

Note: It is essential that specific information is recorded with regards to the column/pole, its lamp and the fitted Telecell ID (OSID). It is essential to map the correct OSID to the unique Asset ID. See section 3.6.

Each PLANet Telecell has a unique identity number that is programmed into it at time of manufacture, which is used by the system to distinguish it from others.

Operators of a PLANet network will want to control and monitor lights by reference to the column in which the Telecell is fitted rather than by the Telecell identity number.

It is necessary to record and enter which Telecell identity number is fitted into which column into the system.

It is vital for proper functioning of the system to ensure the matching of Telecell IDs and column references is done accurately, otherwise the system may only appear to be working and when, for example, a fault is reported, the mistake discovered as the fault would not be found in the reported column but in another one. Tracking and correcting this kind of mistake could be time consuming.

The Telecell ID can be found on a printed label on the base of the Telecell.

Note: There are two numbers on the label:

- the OSID which is the Telecell ID (also barcoded)

- The OSID has the following format 0001234567-xx where xx are check digits for the actual number

- The Telecell serial number

The Telecell is supplied with three identical labels. These are intended for use as follows:

- To attach within or outside the luminaire. Inside somewhere clearly visible is recommended if possible.

  Note: avoid locations that will get too hot.

- To attach to a suitable tag (located in the base of the column).
- To attach to installation documentation (see section 3.6). Typically, this will be a sheet with asset IDs and a space next to each to attach the label from the associated Telecell.

It is very important that installation sheets are completed accurately and returned promptly to the operation centre. This is to ensure that the association between the Telecell and the column can be added to the system.

Note: The system cannot operate properly without this.

When used with asset management systems that provide this facility, Telecell IDs and the matching column reference may be captured using PDAs or similar. The Telecell and Column IDs can then be loaded electronically into the asset management system, and from there into PLANet.

Note: This removes the need to manually match the Telecell and column IDs on the PLANet system.

1.9 Standard Deployment Equipment

The packing list will vary dependant on the type of Telecell being installed.

Plug in locking type Telecells will fit directly into a plug in locking type socket whereas Conduit, Two-Part and Post Top Telecells can come pre-installed.

1.9.1 Standard deployment equipment includes:

- 1 x label affixed to the Telecell unit

- 1 x label to fix to paper installation record sheet
- 1 x label to be affixed to column fuse holder
- 1 x spare

1.9.2 Installer Supply List:

- 1 x data capture device (if applicable)
- 1 x paper installation record sheet (optional)

2 Installation

Telecells are manufactured in many different forms. Each form is utilised dependent upon the environment it is to be fitted.

Prior to installation, check the column and report any safety or installation maintenance issues to the installation project manager so that a repair can be scheduled.

2.1 Installation Tasks

The following are the available Telecell variants and steps for installation:

- **Plug in locking type** (external)

ALERT: Ensure to fit the plug in locking type socket correctly following supplier guidelines

1) Align the plug in locking type pins with the socket and insert. The Neutral pin on a Telecell is wider and will only fit the hole next to the 'N' marker on the socket, twist and lock.

2) To lock the Telecell in place, push down and twist clockwise. Pull the Telecell up to confirm it is installed correctly. For wiring information see section 2.2.

3) Turn on the mains supply to the Telecell and observe the Power On / DIM / Off test cycle as described in section 1.7.1. It will turn on for 50 seconds, then turn off. If dimmable: on 25 seconds, dim 25 seconds, then turns off.

4) Record the necessary data as detailed under section 1.7. Data capture will be dependent on available tools, for example: paper based or import via PDA.

5) Affix the Telecell labels described in section 1.7 as necessary.

- **Conduit** (external)

The conduit Telecell is affixed to the lamp via a 20mm diameter thread. The nut securing the Telecell should be tightened to 3 Nm.

ALERT: Check the rubber sealing washer is intact and undamaged to prevent water getting in.

Telecells with built in dimming have 5 wires and those without have 3 wires.

The Telecell must be wired as per section 2.2.

1) Turn on the mains supply to the Telecell and observe the Power On / DIM / Off test cycle as described in section 1.7.1. It will turn on for 50 seconds, then turn off. If dimmable: on 25 seconds, dim 25 seconds, then turns off.

2) Record the necessary data as detailed under section 1.7. Data capture will be dependent on available tools, for example: paper based or import via PDA.

3) Affix the Telecell labels described in section 1.7 as necessary.

- **Two-Part** (internal, requires antenna)

The Two-Part Telecell connections (mains, dimming and antenna) are provided by a wiring loom, which must be connected inside the luminaire.

The Two-Part Telecell is designed for applications without a plug in locking type socket, or 20mm access hole. This Telecell requires an external antenna to be fitted. Typical examples would be:

- Heritage lamps that must conform to strict external appearance
- Traffic bollard or illuminated road sign

Two-Part Telecells consist of a Telecell and an external antenna. The three external antennas available are:

Antenna Type	Part Number	Description
MONOPOLE 	ANT-S-TW-A ANT-S-TW-E	915MHz monopole (SMA) 868MHz monopole (SMA)

LOW PROFILE 	ANT-S-LP-A ANT-S-LP-E	915MHz low profile (SMA) 868MHz low profile (SMA)
EASY FIT 	ANT-S-EF-M	868MHz and 915MHz easy fit (SMA)

1) These Telecells are fitted inside the fixture securely, without compromising the other components and positioned in a manner in keeping with the natural workings.

   Note: This must be wired to the incoming supply and outgoing ballast/driver along with the dimming wires as in section 2.2.2.

2) Connect the antenna to the Telecell.

   Note: DO NOT OVER TIGHTEN RF CONNECTOR (0.3 – 0.6Nm).

3) Turn on the mains supply to the Telecell and observe the Power On / DIM / Off test cycle as described in section 1.7.1. It will turn on for 50 seconds, then turn off. If dimmable: on 25 seconds, dim 25 seconds, then turns off.

4) Record the necessary data as detailed under section 1.7. Data capture will be dependent on available tools, for example: paper based or import via PDA.

5) Affix the Telecell labels described in section 1.7 as necessary.

2.1.1 Two-Part Mounting

The maximum screw insertion depth is 12mm. Base mounting lugs are snap off, if required, to enable mounting in confined spaces.

2.1.2 Two-Part Antenna Connection

The Two-Part version antenna connection uses an SMA connector, the plug is fitted to the Telecell. Additional antenna cabling must use 50ohm coax with low loss at the operating frequency (868 MHz for ETSI variants, 915MHz for FCC variants). It is recommended to contact Telensa before using a longer antenna cable.

- **Post Top** (internal, requires antenna)

The Post Top Telecell is fitted as per the plug in locking type but has an external antenna same as the Two-Part Telecell. This Telecell is typically used where the plug in locking type socket has been installed inside the luminaire casing.

2.2 Wiring Diagrams

For Telecells with attached wires, the wiring colours depend on the market the Telecell is intended for, as shown here:

	ETSI	**FCC**
Live In	Brown	Black
Neutral	Blue	White
Switched Live Out	Red	Red
dimming control positive	Purple	Violet
dimming control negative	Grey	Grey

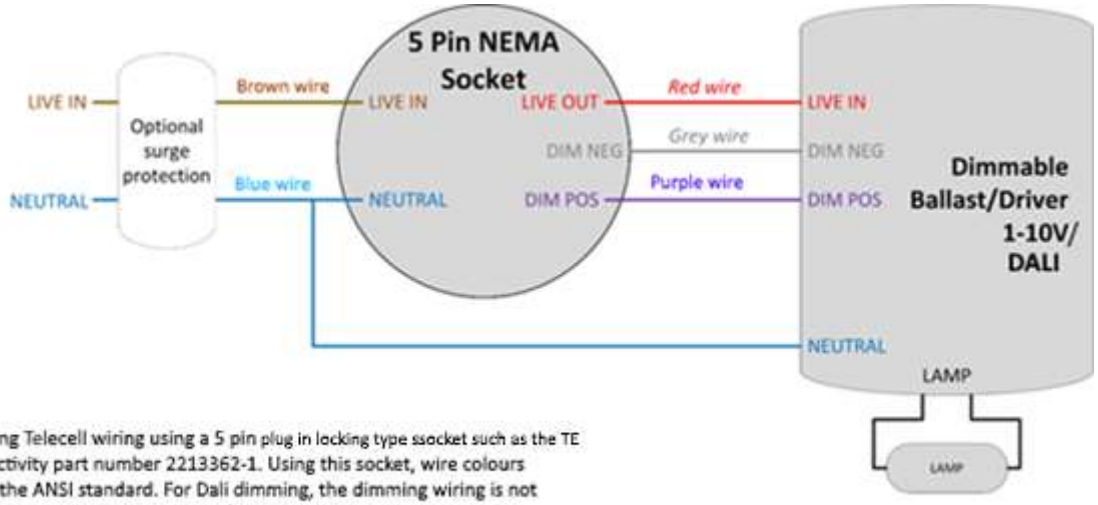
The following diagrams show how the Telecells should be wired. These diagrams show the ETSI wiring colours. For a FCC installation, substitute the colours using the table above:

2.2.1 Wire Gauge

The FCC cable is 18AWG. The ETSI cable is 20AWG.

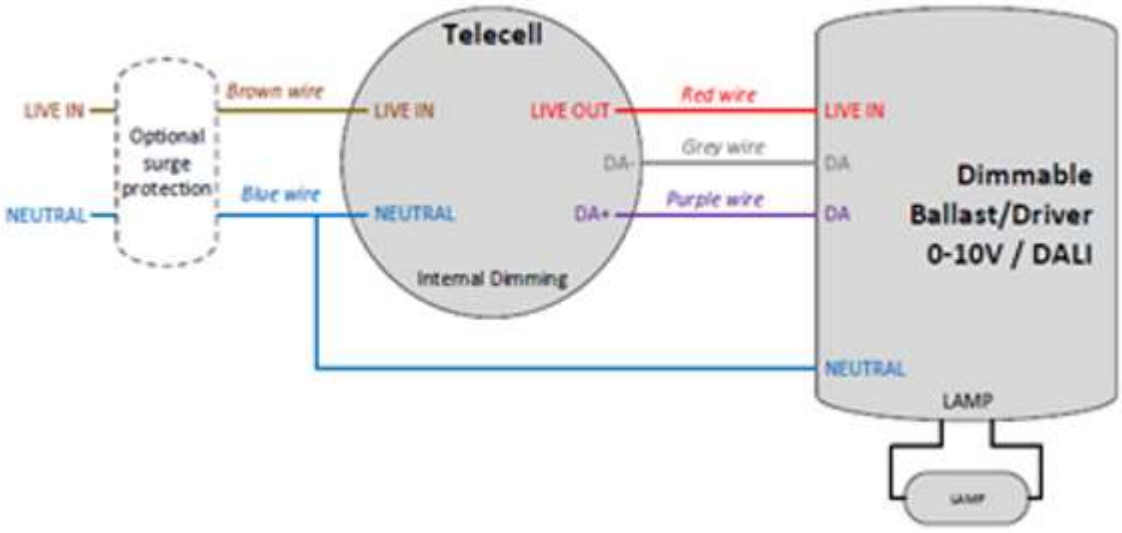
All wires from ETSI Telecells are 20AWG, 105C rated PVC insulation. For the FCC variants, the Live In, Live Out and Neutral wires are 18AWG and the dimming control wires are 20AWG. Standard length is 1m.

2.2.2 Plug in locking type

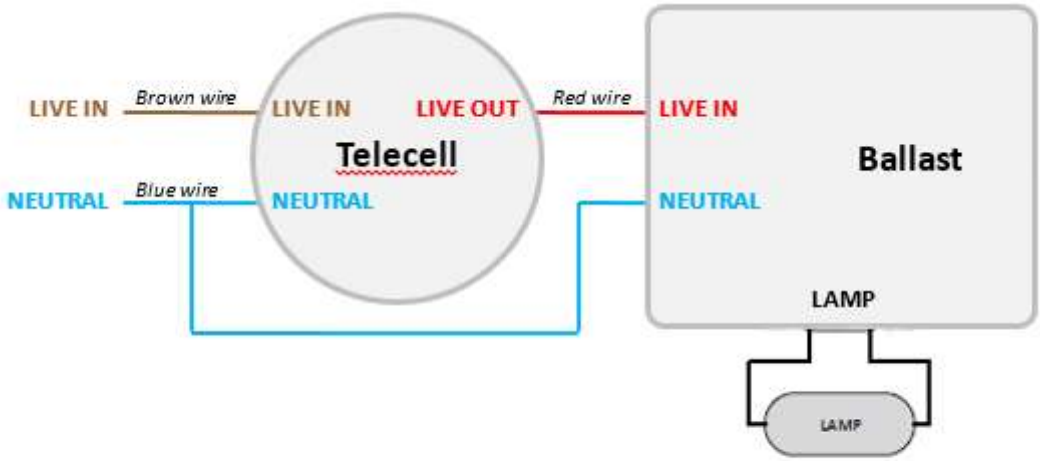


Dimming Telecell wiring using a 5 pin plug in locking type ssocket such as the TE Connectivity part number 2213362-1. Using this socket, wire colours follow the ANSI standard. For Dali dimming, the dimming wiring is not polarity sensitive. Both analogue (0-10V) and DALI dimming use the same pair of wires. Dimming models of the 2nd generation Telecell can be configured over the radio link to support either dimming control method

2.2.3 Conduit and Two-Part with Dimming



2.2.4 Conduit and Two-Part without Dimming



3 Commissioning

3.1 Commission a Telecell

The System Administrator should complete this commissioning phase.

When installing, the only available confidence check for an installer is the Power On / DIM / Off test.

To functionally check each unit fully, the Telecell must be connected to the system, assigned an Asset ID and the correct lamp type and Control, Monitoring and Alarm programs set.

Telecells are loaded onto each system when dispatched. To confirm the Telecell OSID is loaded, filter on the Telecells page within the UI.

3.2 Set Up a Telecell

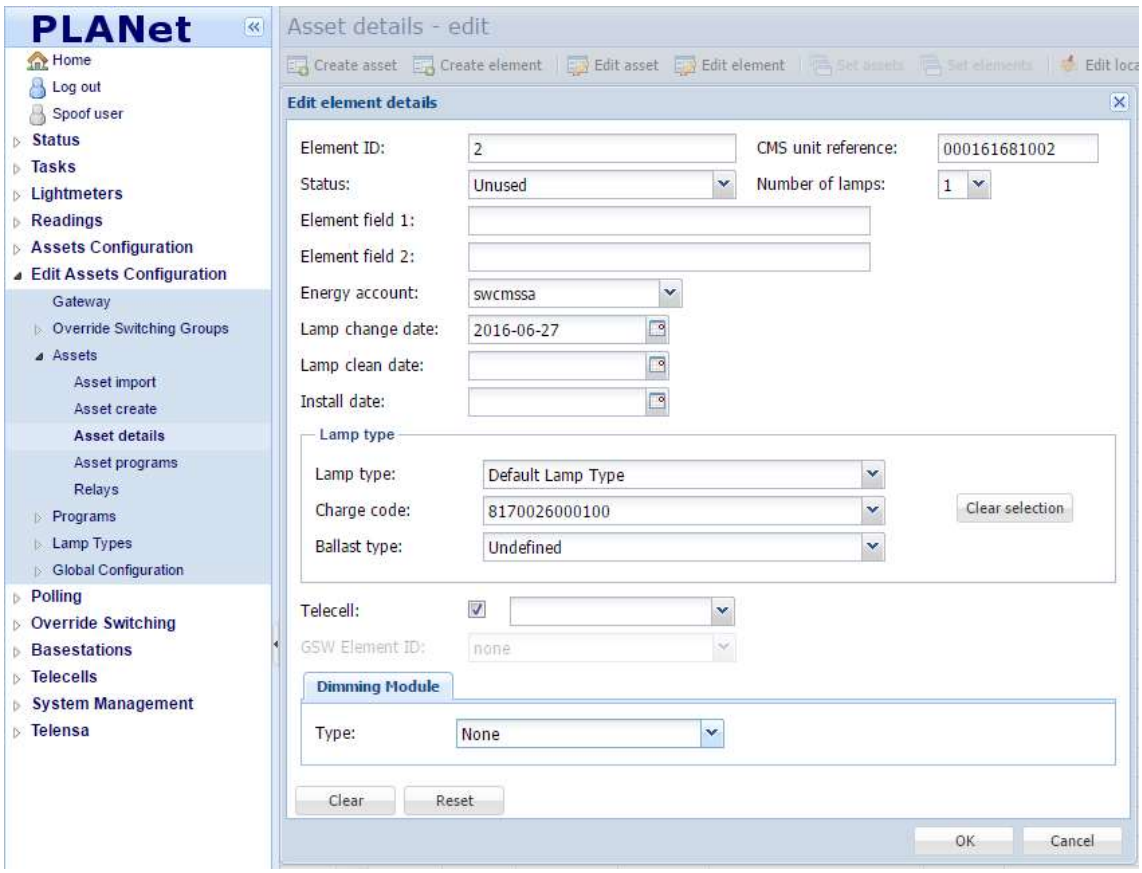
The Telecell(s) must be connected prior to the commissioning phase. In areas with poor coverage, it may be necessary to set up Relays (ROS – Relay Outstation).

3.3 Configuration

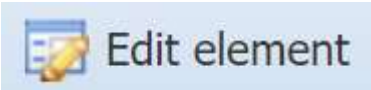
Once the asset has been imported, use the following steps to ensure the Asset returns data and operates as expected.

3.3.1 Set Telecell to Asset

1) Go to **Edit Assets Configuration** > **Gateway** > **Assets** > **Asset Details**:



2) Select the Asset and click **Edit Element**:



3) At the Telecell section, tick the checkbox and add the Telecell OSID to enable it:

4) Ensure the **Status** is set to **Active**.

5) To set Dimming, click the **drop-down button** in the **Dimming Module** section.

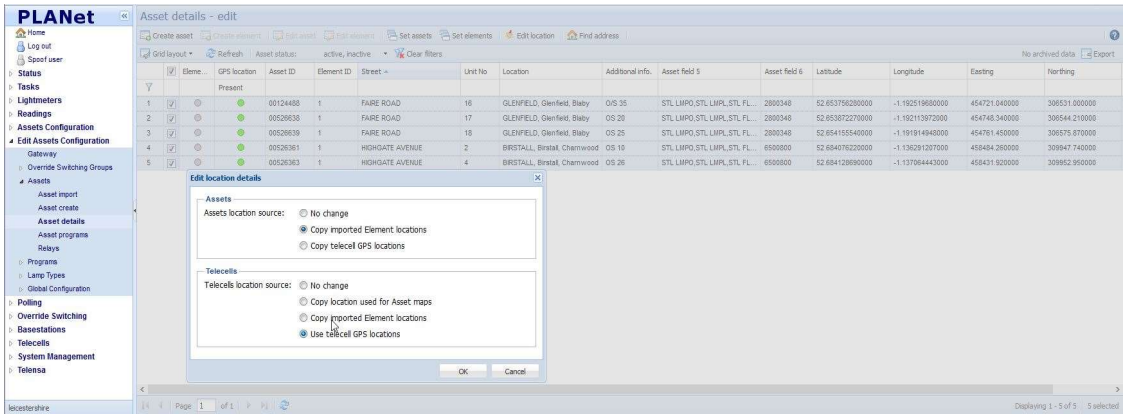
6) To set the **Lamp Type**, click the **drop-down button** in the **Lamp Type** section.

7) Click **OK**.

3.3.2 Set Location

Once the assets are imported it is necessary to set the location sources for both the Telecell and Asset.

1) Go to **Edit Assets Configuration** > **Gateway** > **Assets** > **Asset Details**:



2) Select the **Assets**.

3) Click **Edit Locations**.

4) Select **Copy imported Element locations** (Assets location source).

5) Select **Use Telecell GPS locations** (Telecells location source).

6) Click **OK**.

Latitude and **Longitude** contained within the Asset details page and the Telecell page is derived from the data uploaded to PLANet from the Mayrise hand held devices.

Whereas,

GPS Latitude and **GPS Longitude** displayed on the Telecell page is generated by the Telecell during authentication when connecting to the Basestation.

Note: The **Assets location source** alternative: **No change**, is used if the location data to be used is predefined and already loaded into PLANet.

Note: The **Telecell location source** alternative: **Copy imported Element locations** is used in combination with a specific mobile deployment tool, which provides the GPS location during deployment.

Note: **Copy Telecell GPS locations** would only be selected if no location data is imported from a CMS system to the PLANet system.

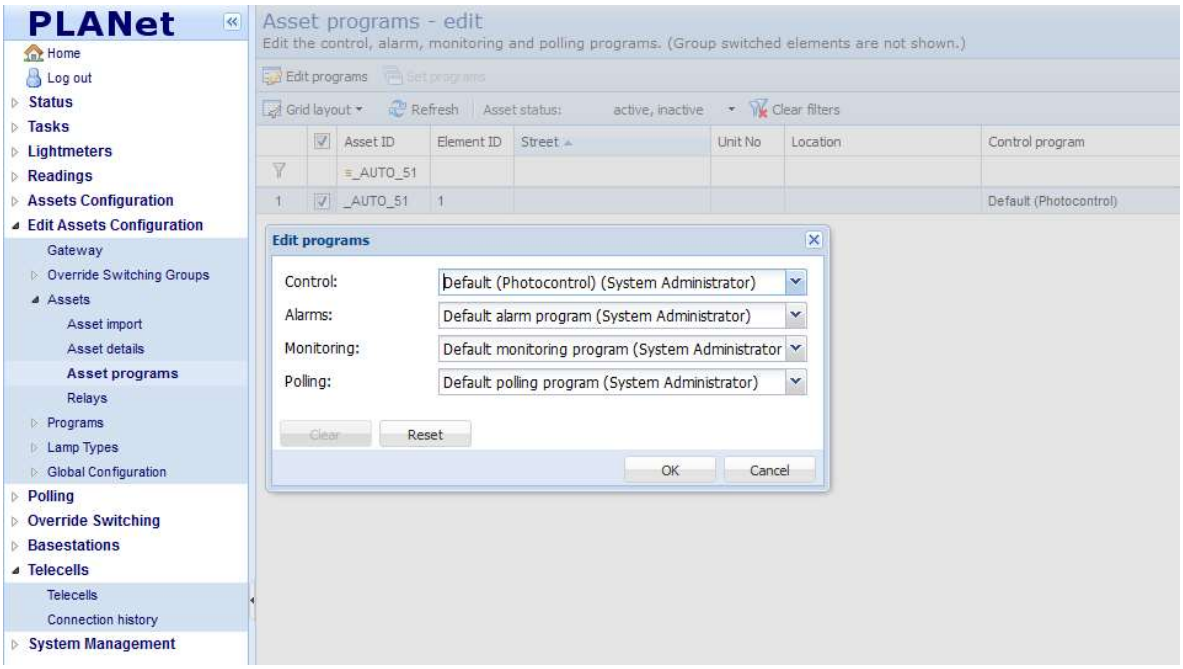
Note: The **Telecells location source** alternative: **No change**, would be selected if no location data is imported from a CMS system to the PLANet system, or for **Copy location used for Asset maps** if the Telecell variant does not provide GPS.

3.3.3 Set Programmes

Once the assets are imported, assign programmes if required:

- Control
- Monitoring
- Alarm
- Polling

1) Go to **Gateway** > **Assets** > **Asset Programs**:



2) Select the **Assets** to assign programs using the **checkboxes**.

3) Click **Edit Programs** to edit a single asset or **Set Programs** to set multiple assets.

4) Select the relevant programs by using the drop-down lists: **Control**, **Alarms**, **Monitoring**.

5) Once complete, return to the Gateway and click **Save and Reprogram**.

3.4 Operational Checks

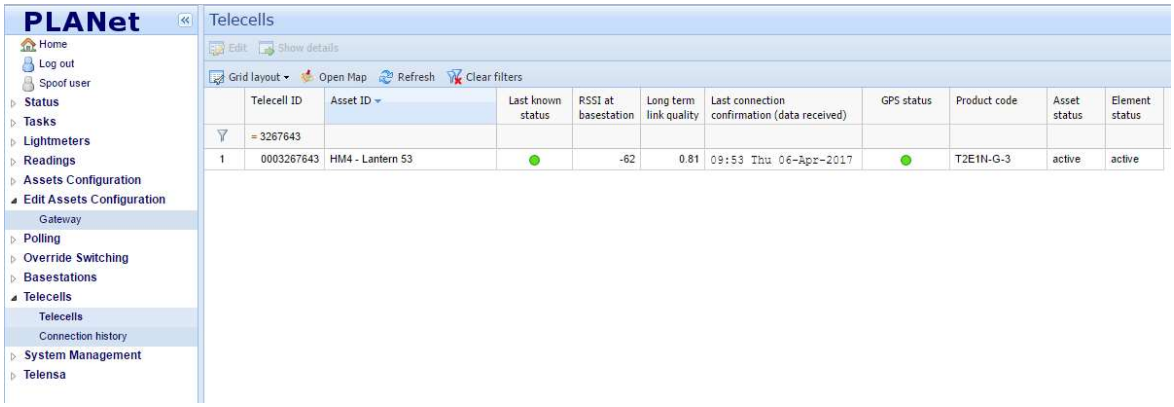
For a Telecell to be controlled and return meaningful data it must be set up correctly. Ensure each Telecell is:

- **Connected**
- Assigned to an **Asset**
- Has a **Control Program** with appropriate dimming levels set within the **Power** tab
- Has the correct **Lamp Type** and **Charge Code Assigned** (make a note of the Circuit Watts within the Charge Code)

3.5 Bring the Telecell into Service

3.5.1 Connection Status

Once installed and powered, the Telecell should connect to the Central System within a few hours. This can be confirmed by observing the Telecells Page within the User Interface.



Filter the Telecell ID column for the OSID.

Note: When a Telecell connects, **the Last Known Status** column symbol turns green and data becomes present in the **Last Connection Confirmation** [data received] column. If the Telecell is not connected, the Test and Commissioning phase cannot be completed.

Note: The **Last Known Status** column is the result of either the success or failure of any last communication with the Telecell.

3.5.2 Telecell Control

To test if a Telecell can be controlled and return meaningful data, use the **Polling** and **Override** functions within the PLANet user interface. The sequence is as follows:

1) Poll the **Asset** (for the power parameter) and record the reading, found within the Readings page – **Readings** > **Lamp Electrical** > **Power**.

2) Override the **Asset** to **Full On**.

3) Poll the **Asset** (for the power parameter) and record the reading, found within the Readings page.

4) Include if the dimming unit is installed - **Override** the **Asset** to **DIM2**.

5) Include if the dimming unit is installed - Poll the **Asset** (for the power parameter) and record the reading, found within the Readings page.

6) Override the Asset to **Return to Normal Operation**.

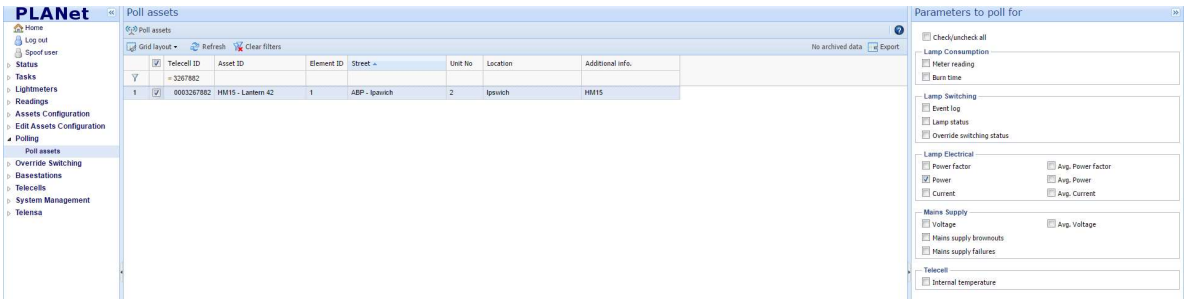
7) Poll the Asset (for the power parameter) and record the reading, found within the Readings page. Confirm that the readings obtained are as expected in accordance with the associated Lamp Type.

Note: The Properties section can also be used to carry out this task on single Assets if the User is familiar with this process.

3.5.2.1 Polling

1) To Poll an Asset, navigate to the **Polling** page, select the **Asset** and **Parameter** to be polled and click the **Poll Asset** tab.

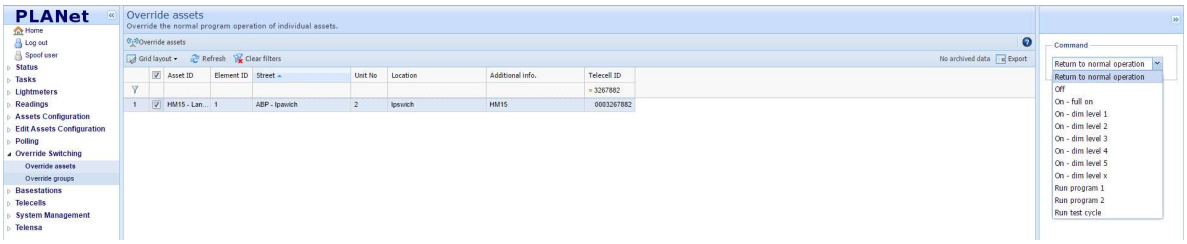
The progress of this task can be viewed within the **Tasks** > **Polling** page.



3.5.2.2 Override

2) To Override an Asset, navigate to the **Override** page, select the **Asset** and **Parameter** to be Overridden and click the **Override Asset** tab.

The progress of this task can be viewed within the **Tasks** > **Override Switching** page.



- Monitor the Event Log 24-48 hours after setup to ensure Telecells are operating as expected.

3.6 Example Installation Data Capture Sheet

Asset ID	Latitude	Longitude	Street	Lamp Type	Additional Information	Confirm Power ON/DIM/OFF Test	Attach Telecell Label

3.7 Example Commissioning Record Sheet

Telecell ID (OSID)	Asset ID	Unit Number	Lamp Type (Nominal Watt)	Control Program	Monitoring Program	Alarm Program	Power [ON/DIM/OFF] Test Cycle	Override ON [Power]	DIM1 [Power]	DIM2 [Power]	Pass/Fail