

**TruRead Plug and Play Pulse Splitter  
Type L4SK0**

**Document Version 1.02**

## **Introduction**

This document describes the requirements and considerations for installation of the LASK0 Plug and Play Passive Pulse Splitter.

The pulse splitter will interface to any gas or water meter having a suitable pulse output. This can be either an electronic volt-free contact or a reed relay.

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## Purpose and Scope

This handbook provides instructions for installing the Plug and Play Pulse Splitter (L4SK0). The document provides an overview of the pulse splitter, details of physical installation, installation considerations and Health & Safety Considerations.

The person installing the L4SK0 will be responsible for ensuring compliance with Health and Safety rules, for performing their own risk assessment and ultimate compliance with the HSE rules.

In this document sections indicated in *red* along with a  warning triangle **MUST** be complied with.

Any section with a *Note*: is for guidance and it is recommended to comply with.

## Safety

### General Safety Warnings

- There are no user serviceable parts inside the equipment;
- Observe all warnings on the equipment and in the operating instructions supplied with the equipment. These may change.
- The installer is responsible for the safe installation of the L4SK0 including location, method of installation and routing of cables.
- Installation and service shall only be carried out by suitably qualified service personnel.
- Local working practices and regulations for wiring and installations must be adhered to.
- Installation must comply with IEC 60335-1
- No modification must be made to the associated logger, meter or local housing that could compromise safety.

## Application of the Plug and Play Pulse Splitter (L4SK0)



The L4SK0 is a purely passive device and as such contains no energy sources, batteries or energy storage devices such as a capacitor or inductors. Therefore the unit will not affect the intrinsic safety rating of any device connected to it. For this reason TruRead have classified the L4SK0 as “Simple Apparatus”. It should be noted that the splitter **MUST** only be used with suitable EEX ia equipment.

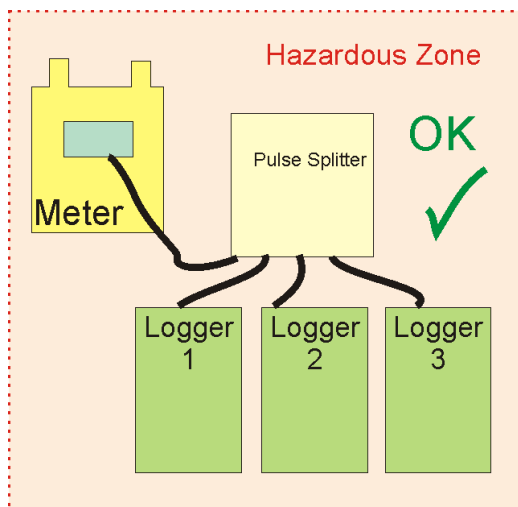
The L4SK0 is a self-contained device designed to split a pulse from a single meter, (gas, electricity water meters and other pulse generating devices incorporating reed relays, open collector or current source) between and up to three data loggers or other equipment including chatterboxes.

Although tested on a wide range of equipment, there are many different circumstances which may prevail. The user must establish the L4SK0 is suitable for their application.

L4SK0 will not change the duration of the incoming pulse or provide pulse de-bounce. If this is required the user must ensure there is an active device following the L4SK0 providing this function.

Because the L4SK0 is purely passive it can be used in *hazardous areas*, as defined by *ATEX*. A hazardous Zone means there can be the presence of gas and air in sufficient quantity to ignite and cause an explosion. A non-hazardous zone means in a place where gas is not expected to escape or exist or present a risk of ignition.

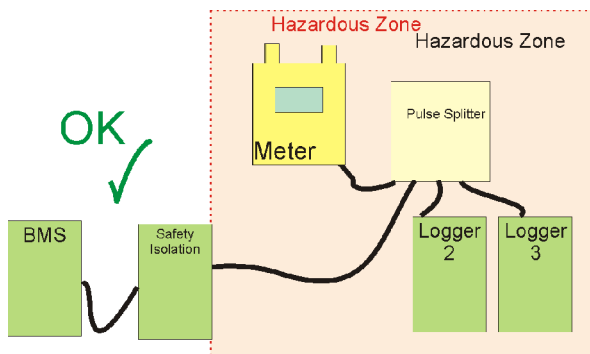
## Use of the L4SK0



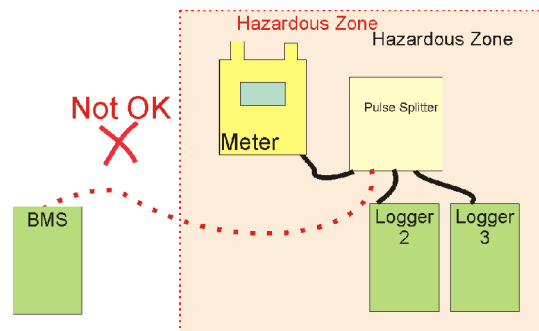
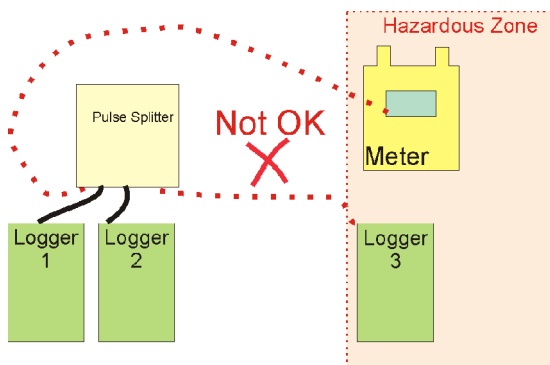
The L4SK0 can be connected to equipment located in a hazardous zone or equipment designed to provide intrinsic safe isolation such as a 'Chatter box'. All such equipment must be Zone 0 rated.

The L4SK0 does not provide safety isolation and so must not connect directly to any equipment which will depend on the logger or other ATEX approved device to provide safety isolation to equipment placed outside the hazardous zone.

In this case a safety isolation barrier must be fitted between the L4SK0 and external device.





The diagrams below illustrate where NOT to use the L4SK0.





## Installation Conditions and Warnings

The installer must be fully compliant with the associated Health and Safety issues and use of the Passive Pulse Splitter in such an environment. The installer is responsible for ensuring routing of cables does not present an electrical safety hazard or compromise gas zone restrictions.

 *The L4SK0 is intended to be used to split the pulse from a single meter (relay) or converter etc. The splitter cannot be cascaded or looped between multiple devices. It is intended where there is one input and output only and cannot be used where there are multiple outputs unless each is independently isolated.*


 *The installer **MUST** ensure the outputs and connections of the L4SK0 are only connected to equipment that are electrically isolated from any other circuit and Earth (Ground). This means equipment powered by batteries such as other logger, approved Chatterbox and equipment including isolation transformers, relays and optical isolation means.*

 *Circuits must be carrying a voltage of no more than 12 volts dc and do not present a shock hazard. Any wiring **MUST** comply with BS7671 and applicable amendments or any other required regulations.*

 *The L4SK0 **does not** provide electrical safety or intrinsic isolation and as such must only be connected to other low voltage electrically isolated circuits carrying a voltage of less than 12 volts dc and do not present a shock hazard.*

 *If wiring presents a voltage of more than 12 volts **DO NOT CONNECT**.*

 *Do not connect any terminal of the L4SK0 to earth.*

 *The enclosure of the L4SK0 can present an Electrostatic hazard and should only be cleaned with a damp or antistatic cloth.*

- Maximum Current applied to the output i.e. Meter Connection of the L4SK0 should be limited to 10 mA d.c. maximum. This is the sum of all currents from the connected loggers/equipment.
- The enclosure provides Protection to IP20 (depending on sealing of the glands). If higher protection is required, there is provision for an additional gasket in the lid of the enclosure.



Note - Warnings

### Warnings on L4SK0 Label

The label on the L4SK0 indicates specific warnings. These must be noted.

## Installing the Plug and Play Pulse Splitter

### ***Installation Personnel and Skills***

The following section outlines the expectations of installers and skills required. Installation companies shall implement a training policy that ensures new installers are adequately trained, understand risk and safety issues and possess the relevant skills before they commence operational duties.

### **Installation Knowledge and Skills**

The installer will need to recognise and understand different metering installations and various equipment associated with those installations applicable to the successful and safe installation of a L4SK0 Passive Pulse Splitter. It is assumed that the engineer installing the equipment will be trained and able to ascertain the suitability of attaching the Passive Pulse Splitter for use with other equipment.

### **Safety Knowledge**

The installer will be expected to understand the hazardous nature of gas and safety issues. The installer shall be aware at all times of the potential hazards with gas and shall exercise due caution in completing the task.

### **Responsibility**

It is the responsibility of the Installer to ensure that all AMR equipment and Passive Pulse Splitter is safe, fit for purpose and meets the requirements of the customer.

### **Site Requirements**



*The installation of the units must also be in accordance with any local codes that may apply and should only be carried out by a competent engineer who has the necessary training.*

### **Location**

The location of equipment shall take account of any Hazardous Area Zone classification and other safety considerations. It shall be positioned so as to avoid causing any risk to safety or creating a hazard. It shall be securely fixed, and shall not present an impediment to the use of any other equipment in the vicinity.

The installer will carry out a full risk assessment before proceeding with any works.

Access to the Meter or other equipment for servicing etc. shall not be impeded by the position of the L4SK0.

### **Site Environment**

The Installer shall ensure the L4SK0 is suitable for the physical conditions of the installation including the range of expected environmental conditions e.g. temperature, humidity, vibration, exposure to chemicals or corrosive materials etc.



## Making Good

The Installer shall ensure that on completion of any installation work the site is restored as closely as possible to the condition in which it was found prior to the commencement of the work.

The Installer shall ensure that redundant or surplus equipment, which they remove, is returned to its owner or, if owned by the Installer, is disposed of with regard to the security of the equipment and the relevant environmental legislation.

The installer shall follow the relevant equipment manufacturer's instructions.

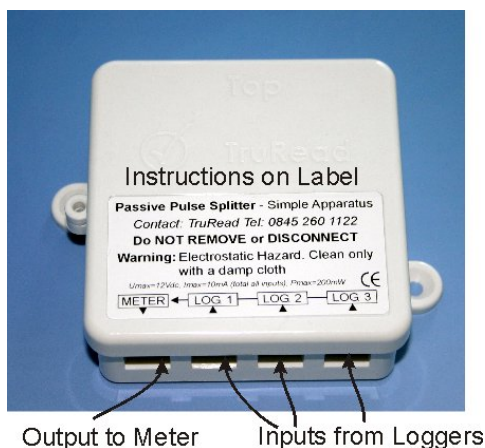
## Fixing and Mounting

The L4SK0 can be mounted either indoors or outdoors, if fitted with the additional gasket. Indoor installation is preferable as this gives added protection from adverse weather conditions and effects of direct sunlight.

The unit can be fixed to a solid surface by two screws or where the unit cannot be fixed by the use of the above method, the installer will ensure that the surrounding area is cleaned by a non-flammable multi-purpose cleaner and a heavy duty double sided mounting tape is used.

### Notes on Installation:

- *If mounted outdoors, the L4SK0 should be mounted with the interface cables facing down. These cables may require the application of Silicon sealant to provide additional protection against water ingress.*
- *The housing must be protected against mechanical shock.*
- *Secure the unit by attaching the unit to the surroundings by using the two fixing lugs.*



### Connections to the L4SK0

The enclosure of the L4SK0 has four connection points at the bottom of the box.

The left-hand connection is to the meter. This is provided by an RJ10 connection, see below for pin assignment.

All connections to the loggers are provided by RJ11 connectors. The pin assignment conforms to GM7 (see below).

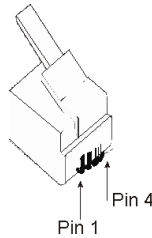
The differing connector types are to ensure the connections between the meter and logger cannot become interchanged.

The label on the enclosure indicates the position of connections.

## Connector Type and Pin Assignment

### Meter Connection

Pin 1: \_ Tamper –Ve  
Pin 2: Pulse –Ve  
Pin 3: Pulse +Ve  
Pin 4: Tamper + Ve



Type - FCC68 4P4C RJ10  
Supplier: RS Components  
Stock No: 331-6336



Example cables to connect between the meter and L4SK0.

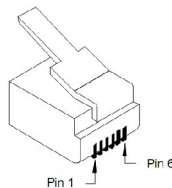
These are pre-wired cables designed to match the L4SK0 and meter (Cello<sup>®</sup> <sup>1</sup> and Converter) connection.

The top cable is a Fischer<sup>®</sup> to RJ10 and the lower cable is a Binder<sup>®</sup> to RJ10.

Other types including RJ11 to RJ10 and Jaeger<sup>®</sup> to RJ10 are available.

### Logger Connection

Pin 1: \_ Tamper Not Used  
Pin 2: \_ Tamper –Ve  
Pin 3: Pulse –Ve  
Pin 4: Pulse +Ve  
Pin 5: Tamper + Ve  
Pin 6: Tamper Not used



Type - FCC68 6P4C RJ11  
Supplier: RS Components  
Stock No: 331-6342

The connection of the RJ11 conforms to IGEM GM7.

Prewired cables are available to provide rapid connection to an existing logger etc.

Tamper between the meter connection out and LOG1 in, is a direct connection. The tamper for connections LOG2 and LOG3 is local to the L4SK0.



### Cable Routing

It is required to separate cable trays, ducts and conduits carrying intrinsically safe circuits from trays and ducts carrying any other cables. e.g. telephones and computer cables. I.E.T. wiring regulations, BS7671:2008 prohibit electrical services e.g. power and lighting to be carried in the same conduit.

<sup>1</sup> Cello is the registered name of the logger product supplied by Technolog

- Observe appropriate recommendations on routing cables.
- Do not route near other service cables and electrical switchgear **especially those carrying mains (110, 240 or other high) voltages.**
- Maximum length of a pulse connection between the L4SK0 and other equipment should be 10 metres.
- Cables must be isolated by separation of distance (at least 50 mm, depending on the nature of the other cable and as defined by BS7671) and by a physical barrier from other service cables.
- When routing the cable avoid sharp edges and pinches.
- Mechanical pressure on either cable may cause performance degradation or result in a short circuit causing interment or failure operation.
- The installer will ensure that all wires are routed so as not to be a hazard or from accidental damage – ideally secured by clips or contained protective trunking.

### **Electro-Magnetic Compatibility (EMC)**

Any equipment installed and the installation itself shall satisfy the relevant EMC regulations and standards. It is the Installers responsibility to determine the relevant standards depending upon the environment of the installation site. This includes routing of cables near to other cables or services.

### **Connection Procedure**

- All connections are made to the outside of the enclosure with purpose designed cables. There is no need for the installer to remove the lid of the enclosure.
- The L4SK0 provides a single output that is connected to the meter or equipment providing the pulse.
- Three input channels are available to allow connection of other equipment.
- The L4SK0 is designed to automatically provide the correct polarity to the source LOG1, LOG2 and LOG3 inputs.
- The connections are all indicated on the label of the L4SK0.

*Note: At no time should this internal circuitry of the L4SK0 be touched or modified.*

*Note: If the connecting (source) device is electronic such as a Converter or device having an Open–Collector output then the correct polarity must be determined and matched to the RJ10 pin assignment. The cables provided assume compliance with GM7 and if this is so the connection will be correct. If it is a device providing the pulse from a ‘reed relay’ such as used in a meter the polarity is not important.*

### **Checking for a Pulse**

It is recommended that a test is made to ensure the logger is receiving pulses from the meter or upstream logger.

### Example Connection Sequence



The diagram illustrates a Cello<sup>®</sup> logger connected to a meter register having a Fischer<sup>®</sup> connector.

This is a typical scenario.



#### **Step 1 – Fit the L4SK0 and Second Logger**

First stage is to fit the L4SK0 and second logger and fixed in place.

The second logger is connected to LOG2 of the L4SK0 using the cable provided by the logger manufacturer. This is a cable terminated in an RJ11 connector conforming to GM7.



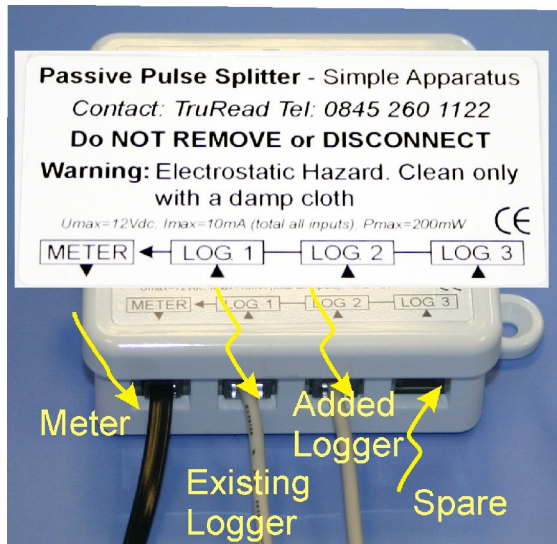
#### **Step 2 – Fit the Cables**

Next stage is to fit the same cable as used by the existing logger to the L4SK0 meter out terminal and the equivalent female/male cable to match the existing logger to LOG1.



#### **Step 3 - Reconnect**

The next stage is to disconnect the existing logger and connect to the meter connection of the L4SK0 to the meter and then reconnect the existing logger to the LOG1 connection via the adaptor cable.



The final installation should be as illustrated.

## Legal Information and Disclaimer

Information in this document is subject to change without notice.

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TruRead exercise due diligence to ensure the material is accurate and that the L4SK0 is suitable for use in stated applications. However, we are unable to test with every type of equipment and combinations of installation circumstance. Therefore the user must ensure the L4SK0 is suitable for their application and the entire risk as to its quality, performance, or applicability is with the user.

This document is published solely on an "as is" basis. The user should not rely on this information as absolute and is responsible for understanding the information provided. We cannot be held responsible for actions the user may take without proper advice. The opinions based in this document cannot take into account all the possible circumstances of a particular installation.

The ultimate responsibility for safety and compliance of a complete system remains with the installer. If there is any doubt at all, seek expert advice on the particular problem.

## Special Requirements and Branding

Where required the customer can order the L4SK0 with their brand and company Logo.

## Change Record

Version	Notes	Checked	Author	Date
1.0	Original		Alan Jones	08/07/2009
1.01	Minor editing and corrections	Jon Hunt		09/07/2009
1.02	Renamed product	Alan Jone		28/10/09