

INSTALLATION MANUAL

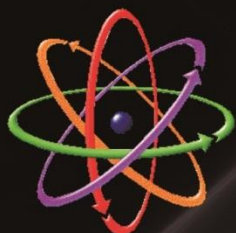
RS-200/300/400

Radiation Portal Monitoring Systems

INSTALLATION MANUAL

Part Number P-1324.02.00

Revision 2.0



RADIATION SOLUTIONS INC.

A New Generation of Radiation Detection Technology

www.radiationsolutions.ca

Revision History			
Date	Rev level	ECO #	Description
Feb 18, 2009	00.00	NA	Preliminary Manual
June 10, 2009	00.01	NA	Add RS-C1 Safety document to Appendix
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Product Manual - Disclaimers:

Due to our efforts to continuously improve this product; specifications, dimensions, operating features and procedures described in this manual are subject to frequent changes. The printed version of this manual reflects only the configuration current at the time of printing. The most current version of the manual is provided in electronic format on the Product Support CD supplied with the instrument. Please refer to the electronic version of the manual for the most accurate interpretation.

RS-200/300/400 - MANUALS in this series:

- a) **P-1324** – INSTALLATION manual
- b) **P-1327** – START-UP manual
- c) **P-1323** – OPERATORS' manual
- d) **P-1322** – RSO manual
- e) **P-1328** – MAINTENANCE manual

CONFIDENTIAL DISCLOSURE

USERS ARE HEREBY NOTIFIED THAT THIS MANUAL CONTAINS TECHNICAL INFORMATION OF A PROPRIETARY NATURE. THIS INFORMATION IS NECESSARY FOR TECHNICALLY KNOWLEDGEABLE USERS TO UNDERSTAND SYSTEM OPERATION AND TO SATISFY THEMSELVES THAT THE SYSTEM IS PERFORMING CORRECTLY.

RADIATION SOLUTIONS INC. ACCEPTS THAT IT IS THE RIGHT OF SUCH USERS TO BE PRIVY TO THIS INFORMATION. HOWEVER THIS DOCUMENTATION IS PROVIDED SOLELY FOR THE BENEFIT OF OWNERS OF THE RS-200/300/400 SYSTEM AND DISSEMINATION OF THE DETAILED TECHNICAL INFORMATION PROVIDED MAY BE CONSIDERED AS LEGALLY CONTRAVENING THE NORMAL SUPPLIER/CUSTOMER RELATIONSHIP.

UNAUTHORIZED RELEASE OF DETAILED TECHNICAL INFORMATION TO A THIRD PARTY WILL BE CONSIDERED AS A CONTRAVENTION OF USER AGREEMENTS.

Manufactured by Radiation Solutions Inc., 386 Watline Ave, Mississauga, Ontario, Canada, L4Z 1X2

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1.0 Introduction

1.1 General

The following INSTALLATION manual includes all the basic information required for a typical installation of a RSI Radiation Detection System. The manual covers the RS-200/300 and 400 systems.

A **Recommended Stand Design drawings** set for the RS-200/300/6000 system are supplied in Addendum A to this manual – if other detector drawings and/or configurations are required they will be supplied with this manual to suit the configuration ordered.

There are various manuals available as noted below

- a) **P-1324 – INSTALLATION manual (this manual)**
- b) **P-1327 – START-UP manual**
- c) **P-1323 – OPERATORS' manual**
- d) **P-1322 – RSO manual**
- e) **P-1328 – MAINTENANCE manual**

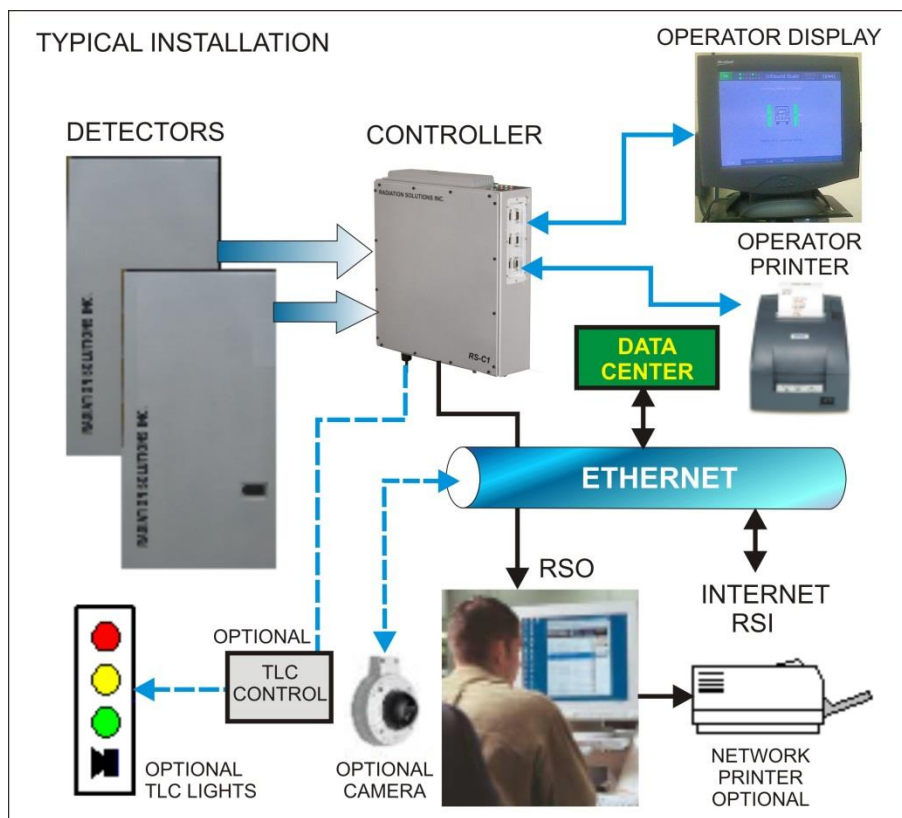
If the customer is doing system Start-UP please request the START-UP manual from RSI-Service – service@radiationsolutions.ca

USER, RSO and MAINTENANCE manuals will be supplied with the shipment

1.2 Typical Installation

The figure shows a typical installation for the RS-200/300/400.

The **DETECTORS** (1-14 for each system – 7 per side (Det A or Det B)) are connected to a System **CONTROLLER** where analysis takes place. The system Controller then interfaces to the user Display, Printer and Network as required. The Network provides system Overview from the Radiation Safety Office (RSO) as well as enabling Internet connection to RSI for technical support. An optional TLC controller can be used for Traffic Light control at the detectors.

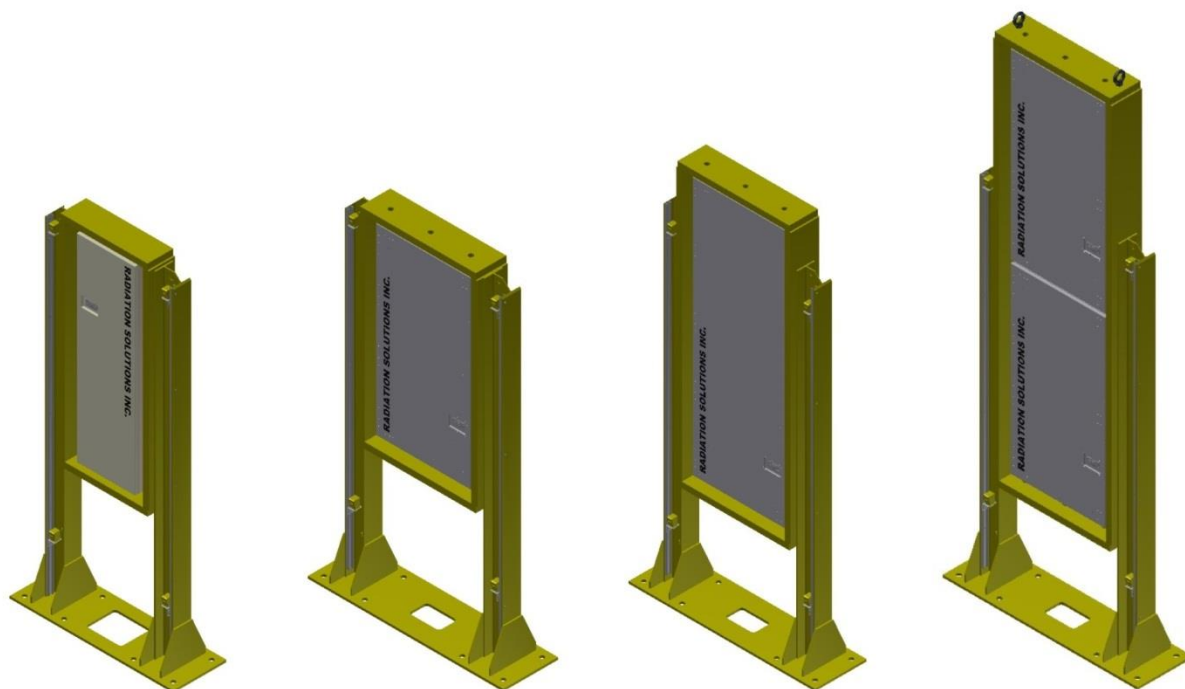


1.3 Detectors General

The RS-200 detector has 1512 or 3024 cu in of detector volume and uses 2 PMT technology.

The RS-300 detector has 3024 cu in of detector volume and uses 3 PMT technology. The detector assembly has been designed to be **exactly the same size** as the majority of older technology detectors to permit direct replacements without changing the installation.

The RS-400 detector has 4698 cu in of detector volume and uses RSI's new 4 PMT technology with PMTs at both ends of the detector to compensate for light losses along these extra-long detectors.



Typical RS-200/300 Detector Installation
1500ci detector is shown on the left

**Typical RS-400
Detector Installation**

Figure 1-1 - RS-200/300/400 Detector Stands

Note: Figure 1-1 shows the detectors mounted vertically, they may also be mounted horizontally for some replacement conditions. Figure 1-1 also shows the RS-200/300 mounted as a 2 detector configuration, it may also be mounted as a single detector.

The RS-200/1500 is a smaller detector and is shown on the left

Note: For proper vehicle coverage it is essential that detectors be mounted **ON EACH SIDE** of the portal lane, as the vehicle load density is too much for a detector to work only from one side.

In many applications an **OVERHEAD** detector is also recommended – see **RSI Technical Note RSS-801** for recommendations.

1.4 System Specifications

The following information is provided for the purpose of design layout and structure.

Detectors:

RS-200 Detectors:	
Volume:	1500 cu in/detector (1512 cu in actual volume) – 24.754L
Size:	16" W x 60" H x 7.2" D (406 x 1524 x 183mm)
Weight:	Approx. 95 lbs (44.3 Kg)
Volume:	3000 cu in/detector (3024 cu in actual volume) – 49.6L
Size:	31" W x 60" H x 7.2" D (787 x 1524 x 183mm)
Weight:	Approx. 195 lbs (89 Kg)
RS-300 Detectors:	
Volume:	3000 cu in/detector (3024 cu in actual volume) – 49.6L
Size:	31" W x 60" H x 7.2" D (787 x 1524 x 183mm)
Weight:	Approx. 195 lbs (89 Kg)
RS-400 Detectors:	
Volume:	5000 cu in/detector (4698 cu in actual volume) – 77L
Size:	32.2" W x 90" H x 7.2" D (818 x 2286 x 183mm)
Weight:	Approx. 290 lbs (132 Kg)

Controller:

Size:	14.5" W x 14.7"H x 3.9"D (368 x 373 x 99mm)
Weight:	25 lbs (11.5 Kg)
Power:	115/220V 50/60 Hz AC operation – max 6A @ 115V (12 detectors) typically 3A max for a 2-4 detector system
Enclosure:	Rugged construction, no fan – high dust/water vapor protection - IP66 version available optionally

CONTROLLER ELECTRICAL AND ENVIRONMENTAL SPECIFICATIONS:

Safety: This product is a Safety Class 1 instrument, requiring Protective Earth connection.

The console is shipped with UL/CSA/CE/TUV approved electrical cord installed.

Before connecting to the A/C Outlet, inspect the cord for damage and make sure the AC Outlet has the proper grounding terminal. To disconnect power, simply remove the plug from the outlet.

Input Voltage: 90-264V A/C, 47-63Hz, or 127-370V D/C.

Storage Temperature: -40 to +85°C, 10-95% RH.

Operating Temperature: -20 to +40°C, 20-90% RH.

Power consumption: 6A max.

2.0 Portal Preparation for Installation

2.1 RS-200/300/400 System Installation - Overview

Site preparation is the customer's responsibility. The site layout is prepared according to local requirements, regulations and codes.

a) The Site Preparation includes:

- Site Layout details (see [Section 2.2](#))
- Manufacture of the detector stands (see [Section 2.3](#))
- Excavation and concrete work for the Detector stand foundations
- Installation of anchor bolts for Detector stands
- Installation of curbs, bull-noses and bollards
- Trenching and burial of conduit
- Routing of cables
- Erection of Detector stands on concrete foundations.
- Arranging Lightning protection (see [Section 2.4](#))

b) The Detector Installation includes:

Note: For installation purposes – note that these detectors are all heavy (see specs in [Section 1.4](#)) – exercise caution when handling.

- Mounting Detector components into Detector stands (see [Section 3.2](#))
- Installation of conduit for detector cabling
- Routing interconnecting cables
- Mounting Unistrut and Optical Sensors (OS)
- Cabling termination and connection is the responsibility of the START-UP technician. If the user wants to do this then RSI has a special START-UP manual available, request from RSI-Service – service@radiationsolutions.ca (See [Appendix Z](#) for Contact Information).
- Installing lightning rods and grounding in accordance with local bylaws;
Note: The detectors are to be grounded separately from the lightning rods.

c) The Controller Installation includes:

Note: For proper heat dissipation the controller shall be mounted in a location that allows for a minimum of 2 inches (50mm) of clearance around the perimeter of the controller.

- Mount Controller (see [Section 3.2.3](#))
- Provide 115 or 220V connection power for the system UPS as required.

d) Start-up:

- Covered in the Start-Up manual if required

Notes:

1. Approvals must be obtained from a local civil engineer with authority in the customer's region to mount the detector stands to the footings.
2. Lifting the equipment (i.e. Detector Stands) must be performed under the supervision of a Certified Rigging Specialist. The approximate weight of one Detector Stand with Detector is 3500 lbs (1600Kgs).

2.2 Site Layout Overview

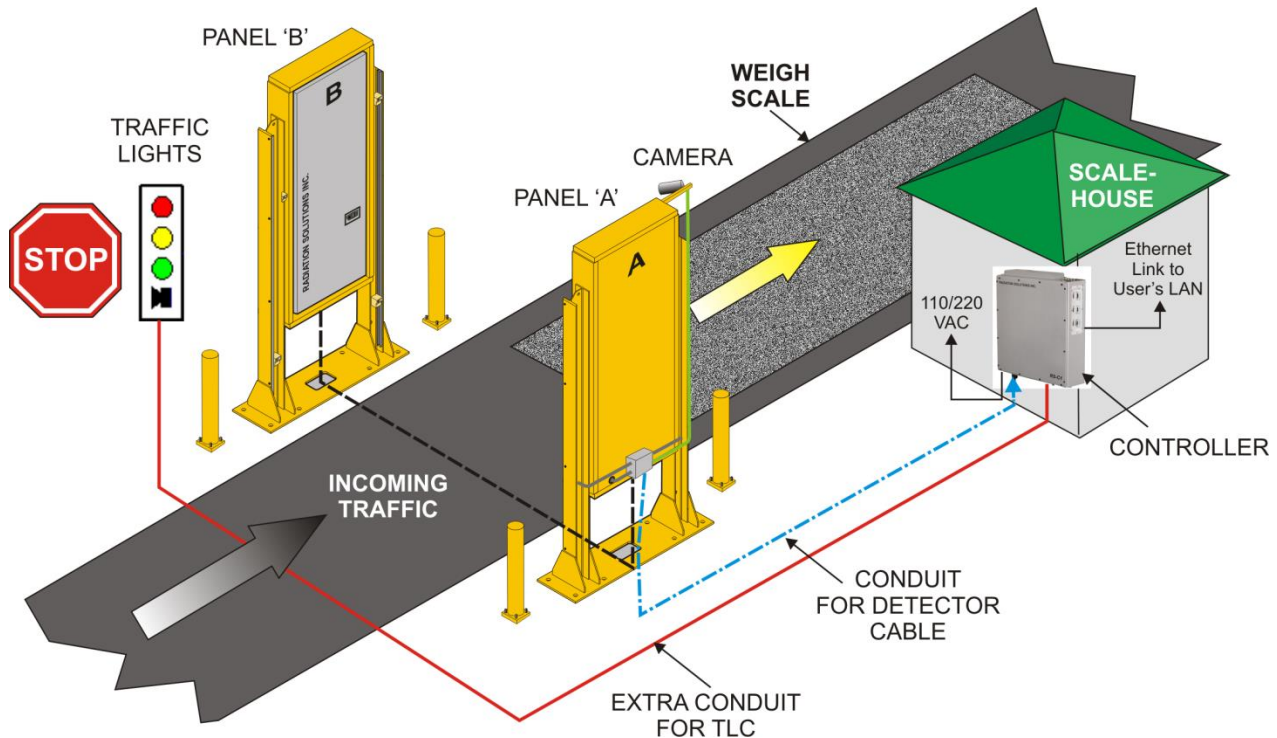


Figure 2-1 - RS-300/400 Site Plan (2 Detector System)

Notes:

- The figure shows the detector placed in the vicinity of the weigh scale. **See [Addendum A - Engineering Drawing P-1326](#) for more details.** Experience has shown that the installation near a scale is highly recommended as this is the one place in the yard that the vehicles are traveling at a sensible speed. High speeds seriously reduce radiation monitoring performance so the lower speeds at the scale make it an ideal location.
- The figure shows that the detectors should be mounted in such a way that the incoming traffic pass through the detectors **BEFORE** going onto the weigh scale to achieve low speed passes.
- Drawing **#P-1326** (see [Addendum A](#) – Engineering Drawings) shows that a STOP sign is recommended 10ft (3m) prior to the detectors to force the vehicles to stop, once again ensuring slower transits and better control.
- An optional TLC (Traffic Light Controller) is available if required to permit “automatic” vehicle guidance to the driver. Contact RSI if this is required.
- It is recommended that the Controller system be mounted as close as possible to the detectors to ensure that in the event of an alarm, the operator can clearly identify the vehicle. RSI supplies sufficient cable for a 100ft (30m) run to each detector. If longer runs are required contact RSI for additional cable.
- The figure shows that buried METAL conduit is required to carry cables from the detectors to the Controller. This is recommended to protect vulnerable cables and also provide additional protection from Lightning and other electrical EM noise.

REFER TO [Addendum A- DWG P-1326](#) SHOWS A RECOMMENDED DETAILED LAYOUT OF THE SITE.

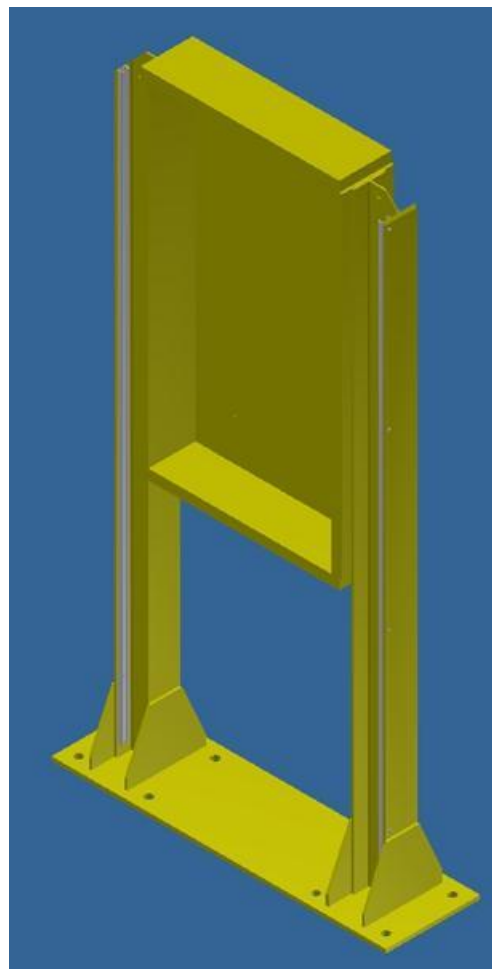
2.3 Detector Stand Overview

The figure shows a typical single detector mounting stand used for a RS-200/300 detector system.

The appropriate stand drawing will be sent out to the user with this Installation Manual.

This manual includes 2 detector stand drawings for the RS-200-1500ci, RS-200/300-3000ci and RS-400-5000ci detectors (in the [Addendum A](#) at the end of this manual) to demonstrate recommended conduit runs and typical detector mounting methods. Many customers prefer their own stand design so these typical drawings are a useful reference.

NOTE: RSI has recommended detector stands for a variety of detector configurations including RS-200/300/400 – 1-14 detector systems.



Contact RSI at service@radiationsolutions.ca if the correct drawings were not supplied. (Also see [Appendix Z](#) for contact information)

2.4 Lightning Protection

The majority of detector failures for Vehicle Monitoring systems are due to Lightning strikes. These detectors are usually located close to piles of scrap that act as “magnets” to attract lightning. RSI has gone to great lengths to incorporate Lightning Protection into system design by decoupling all signal connections so they are full floating and less affected by EM fields generated by lightning strikes. In addition we have installed very extensive electronic surge clamps on all signal lines to “trap” and bypass any EM surges to protect the system electronics.

However it is impossible to protect against a direct strike on the detectors so for this reason RSI recommends that all detectors are installed with lightning protection to the US NFPA 780 standard to offer proper protection.

This simple sketch here outlines the basic requirements to install lightning rods and ground drains for the detector. If installed approximately as shown then this should provide adequate protection for BOTH detectors, **so only 1 detector requires the lighting protection system installation.**

It is very important that the ground drain final connection into the ground be in a spot that is not too dry. Experience shows that in some arid locations it is necessary to pour Copper Sulphate into the ground hole to reduce the ground resistivity below the 0.2 ohm level required by the standard.

Key points are:

- Copper rod extending above the detectors
- large diameter copper wire to provide a low resistance path
- large diameter copper rod deeply buried in ground with low resistivity
- high quality tight connections to ensure that the whole copper assembly offers a much lower resistance path than the stands themselves.



2.5 Conduit Installation Overview

All exposed conduit and fittings should be NEMA 4 rated, Stainless Steel is preferred but Galvanized is an acceptable alternate. All buried conduit must comply with local codes, regulations and site requirements. RSI does NOT supply conduit and fittings. Some locations use only PLASTIC conduit, while this is acceptable, users should be advised **THAT METAL CONDUIT SIGNIFICANTLY IMPROVES LIGHTNING PROTECTION SO IT'S USE IS RECOMMENDED FOR AREAS WHERE LIGHTNING STRIKES ARE AN ISSUE.**

The routing of conduit and location of components described in this manual is presented as a preferred configuration. The installer may alter the configuration to suit the local conditions, site layout, and/or other considerations. It is critical, however, to maintain the NEMA 4 rating throughout the system. Refer to [Addendum A](#) - Engineering Drawing [#P-1326](#) for conduit run requirements and Engineering Drawing [P-1325 – shts 1-3](#) for OS mounting details.

Users must modify the final design to suit local materials but the method shown below is reliable, neat and easy to install and service, so is recommended if possible. The figure and notes describe an excellent method as a guide to the user. Note the system demonstrates conduit connections to a 2 detector system (1 each side) but the ideas can be easily utilized in multiple detector installation.

- a) **Metal conduit IS HIGHLY RECOMMENDED** for cable runs from the building to the Junction box near the detectors, to ensure best Electromagnetic protection in case of local EM radiation (also for durability)
- b) Use **flexible metal or solid conduit** between the final detector junction box and the Junction box connected to the building where possible

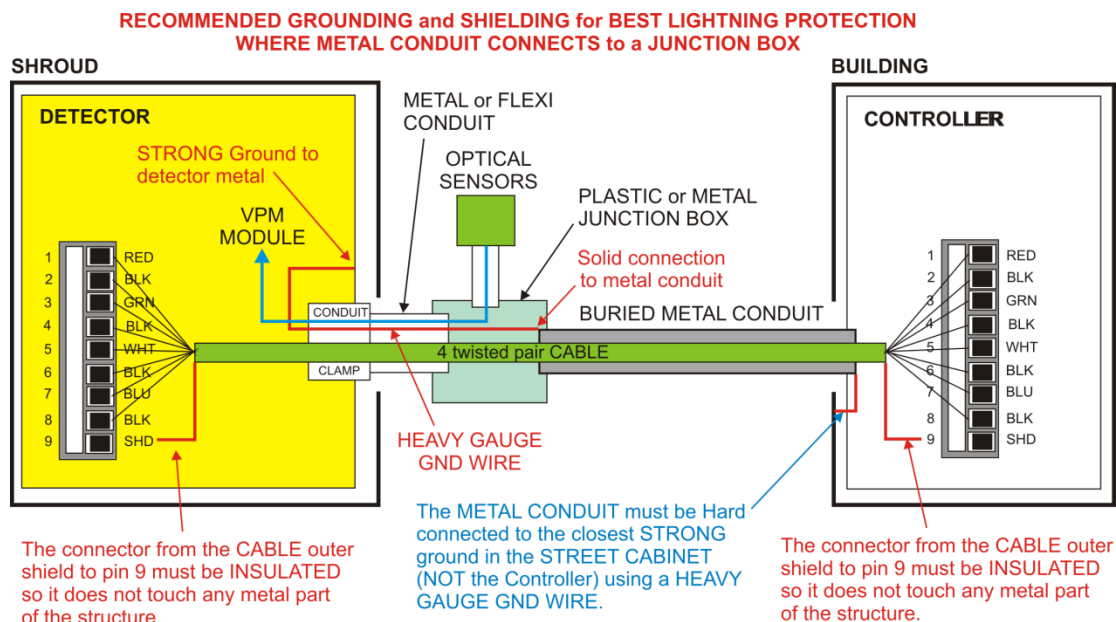
NOTE: Every effort must be made to prevent any water/dust getting into the detectors as the system electronics has many high voltage components that are susceptible to moisture – make sure all seals are water and dust tight.

NOTE: **IT IS OF COURSE ESSENTIAL THAT THE METAL CONDUIT IS GROUNDED CORRECTLY OTHERWISE IT ACTS MORE LIKE AN ANTENNA**

NOTE: **Typically minimum 30mm (1-1/8") ID conduit is used – because the main conduit from the detectors to the building must carry 2 cables each of 10mm diameter but usually users also run a CAT6 cable as well for future use if cameras need to be added.**

2.5.1 Typical Installation Wiring and Grounding Issues

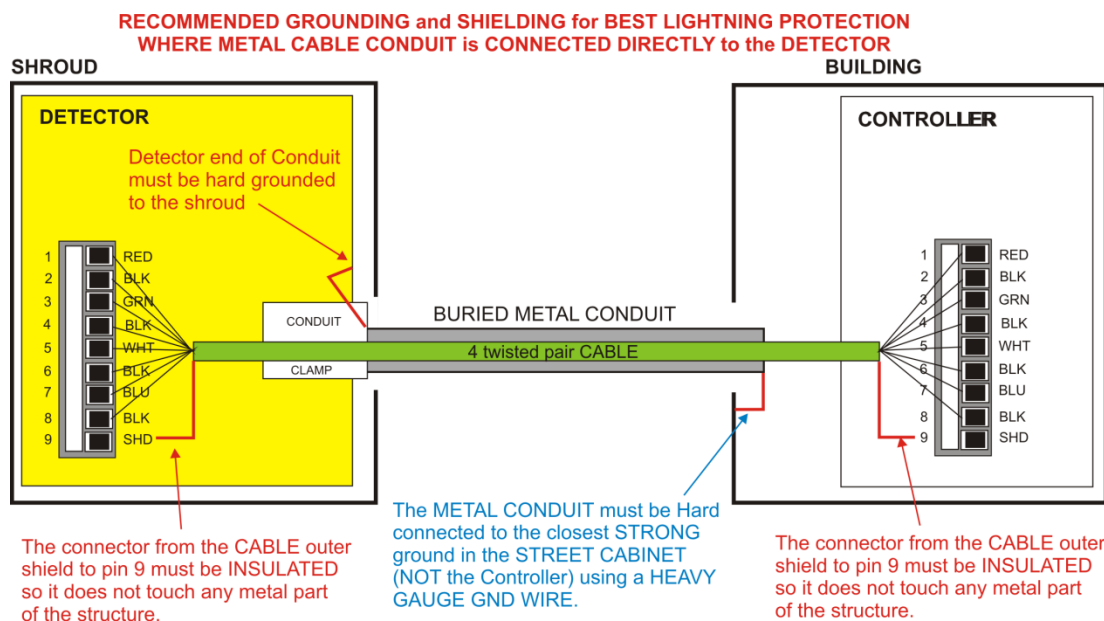
The following figure shows typical installation wiring issues. Typically 2 or more detectors are used so it is necessary to use a Junction box to route the wires properly and this situation is as shown.



NOTE:

- METAL conduit is used from the Controller to the Detector junction box for the best lightning protection.
- A junction box is used at the detector for ease of cabling, (prefer metal but plastic is common).
- In case of a Plastic J-box – it is necessary the HARD GROUND the metal conduit to the detector CHASSIS GROUND - NOT the electronic ground.
- Insulate the cable shield connections at both ends as shown in the figure.

In some applications (typically a Charge-Bucket) only a single detector is used in which case the following figure is more typical.



3.0 System Installation

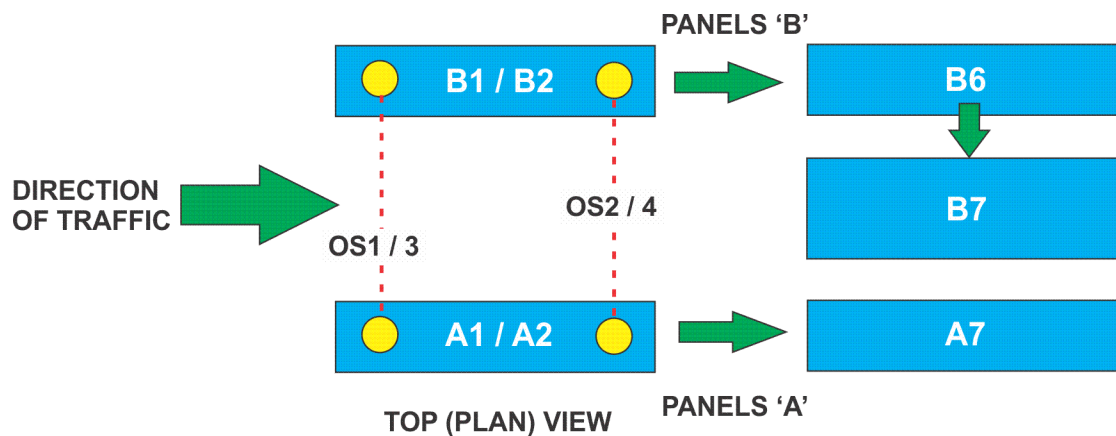
The following assumes that all Site Preparation work has been completed.

3.1 Detector Labeling Conventions and Configurations

NOTE: RSI LABELS ALL DETECTORS PRIOR TO SHIPMENT AS **A1, A2, B1, B2** etc. USER SHOULD CLEARLY IDENTIFY THESE LABELS PRIOR TO INSTALLATION TO ENSURE THAT THE APPROPRIATE CONFIGURATION IS USED. ALTHOUGH THE SYSTEM CAN BE RECOVERED IF THE DETECTORS WERE “MIXED-UP”, TO AVOID CONFUSION AND UNNECESSARY DELAYS THE USERS ARE URGED TO FOLLOW THE STANDARD CONVENTION.

The detector orientation and labeling are important to standardize and ensure that future tech support fully understands the detector positioning and labeling.

For this reason – RSI has adopted a Standard Convention shown in the figure.



Mount Detector **A1** - on the PASSENGERS (NA), (or the DRIVERS (EURO)) side as they enter the plant as shown. The opposite detector on the DRIVERS (NA), (or the PASSENGERS (EURO)) side is then **B1**. The figure above shows the standard detector naming conventions.

3.1.1 Detector Orientation

The following figure illustrates the proper positioning of the detectors. Up to 7 detectors can be connected to each side (A or B). Detector side **A** or **B** is established by the detector connector on the SCT CCA in the Controller. The factory electronically addresses each detector with a specific number (Detector #1 to 7) and they must be connected in that sequential order.

It is imperative that the detectors are configured correctly so that RSI-Service can assist you in troubleshooting and for correct parts replacement.

The following sequence should achieve success:

- All detectors shipped from RSI have a detector designation predefined, labels are placed on the detectors to facilitate installation, they are labeled A1, B1...C7 etc. as required.
- Figure 2-1 shows the correct designations – **NOTE that the figure shows a vehicle ENTERING the detector portal on the way INTO the plant.** A (5 detector) system is shown to cover most possibilities, note that a 2 detector system would only be detectors A1 and B1.

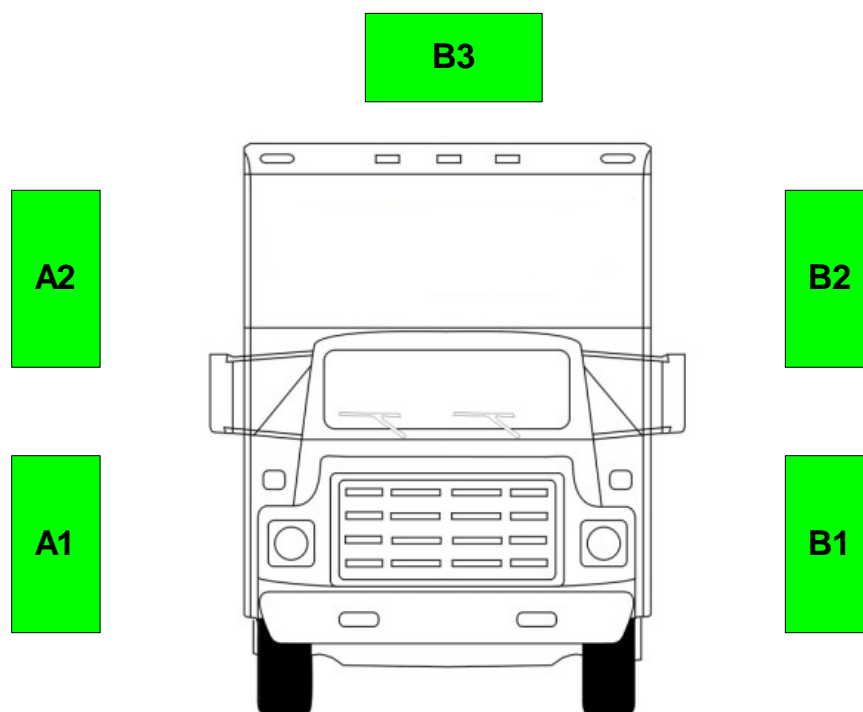


Figure 3-1 Detector Orientation

NOTE: The detector on the DRIVERS (NA) side is **B1**, (or the PASSENGERS (EURO)) side is then **B1**.

3.2 Installing Detectors

3.2.1 RS-200/300/400 Detector Assembly

With the detector stands lying FLAT for easier access - mount the Detectors to the Detector Stands as follows, **refer to Figure 3-2**. If the detectors are using existing stands, changing detectors using a fork lift should be adequate.

1. Position the Detector (which weighs 195 lbs (89 Kg) for RS-200/300 or 290 lbs (132 Kg) for RS-400) using a fork lift truck into the Detector Stand, making sure that the bolt holes match.
2. Fasten the Detector to the shroud with four 5/16-18 UNC x 3-9/16" LG S.S. threaded rods, four 5/16" S.S. flat washers, four 5/16" S.S. lock washers and four 5/16-18 S.S. hex nuts supplied by RSI in the Installation kit. **ENSURE THE PROVIDED HARDWARE IS USED – DO NOT SUBSTITUTE METRIC AS THE THREADS INSIDE THE DETECTOR ARE UNC.**
3. Torque 5/16-18 S.S. hex nuts to 110 in-lbs (13 N-m).

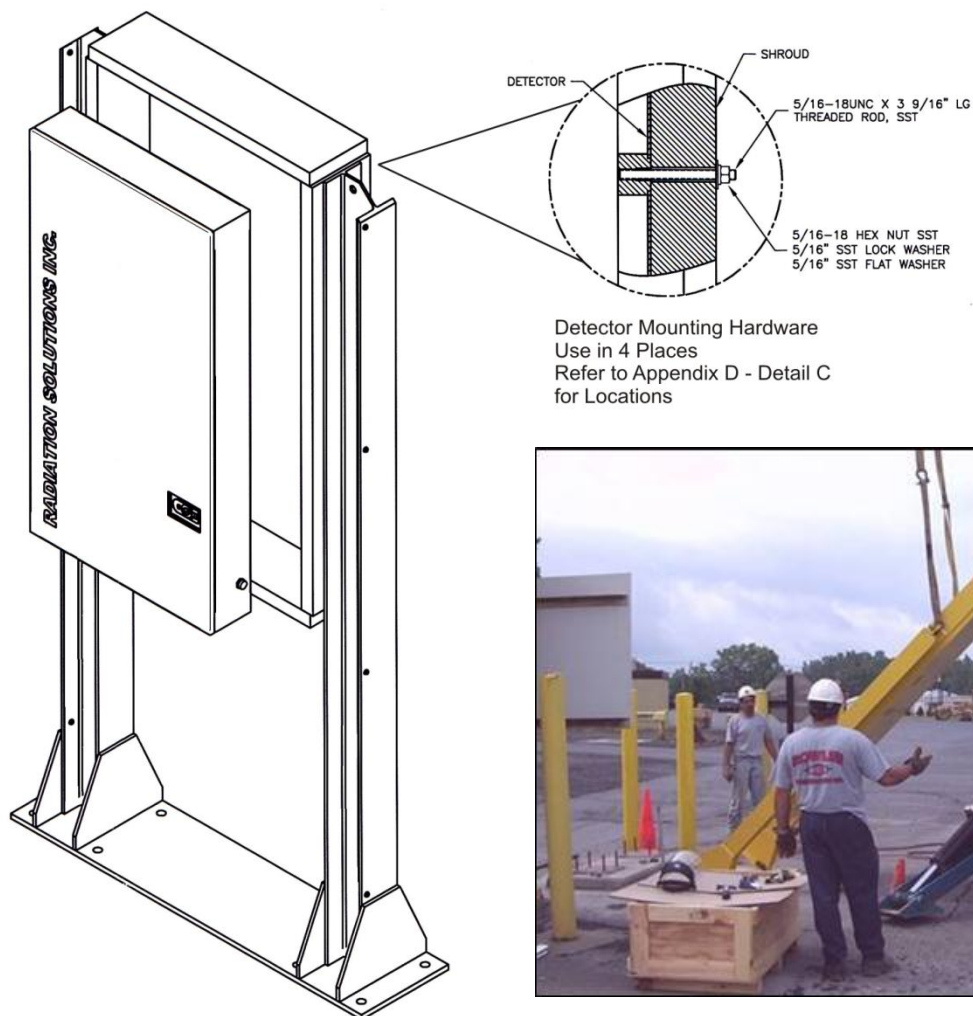


Figure 3-2 Detector Mounting

NOTE: Comply with local safety rules and use appropriate equipment and care (typically as shown in this photo).

3.2.2 Installing Optical Sensors (OS)

Install the OS Unistrut (supplied by customer) to mount the OS.

Best practice system design is to install the Unistrut channel to mount the OS onto. This method makes the OS units relatively easy to adjust, yet still maintains adequate protection. See [Addendum A](#) - Engineering Drawing # M-1131 and P-1325 for details.

- NOTE:**
1. Some users may prefer to mount the Unistrut on the detector side of the I-beam to make the wiring a little neater. This is good practice but drilling is more difficult due to the shroud but some users find this a preferred method and they tap into the shroud to mount the Unistrut.
 2. Since the smaller 1500ci detector does not use support structure channel that goes to the ground, it is recommended that the Unistrut for the OS for the 1500ci detector be mounted **INSIDE** the shroud for protection.

Once the Unistrut is mounted, actual OS installation and wiring is carried out by the START-UP personnel.

3.2.3 Mounting the Controller

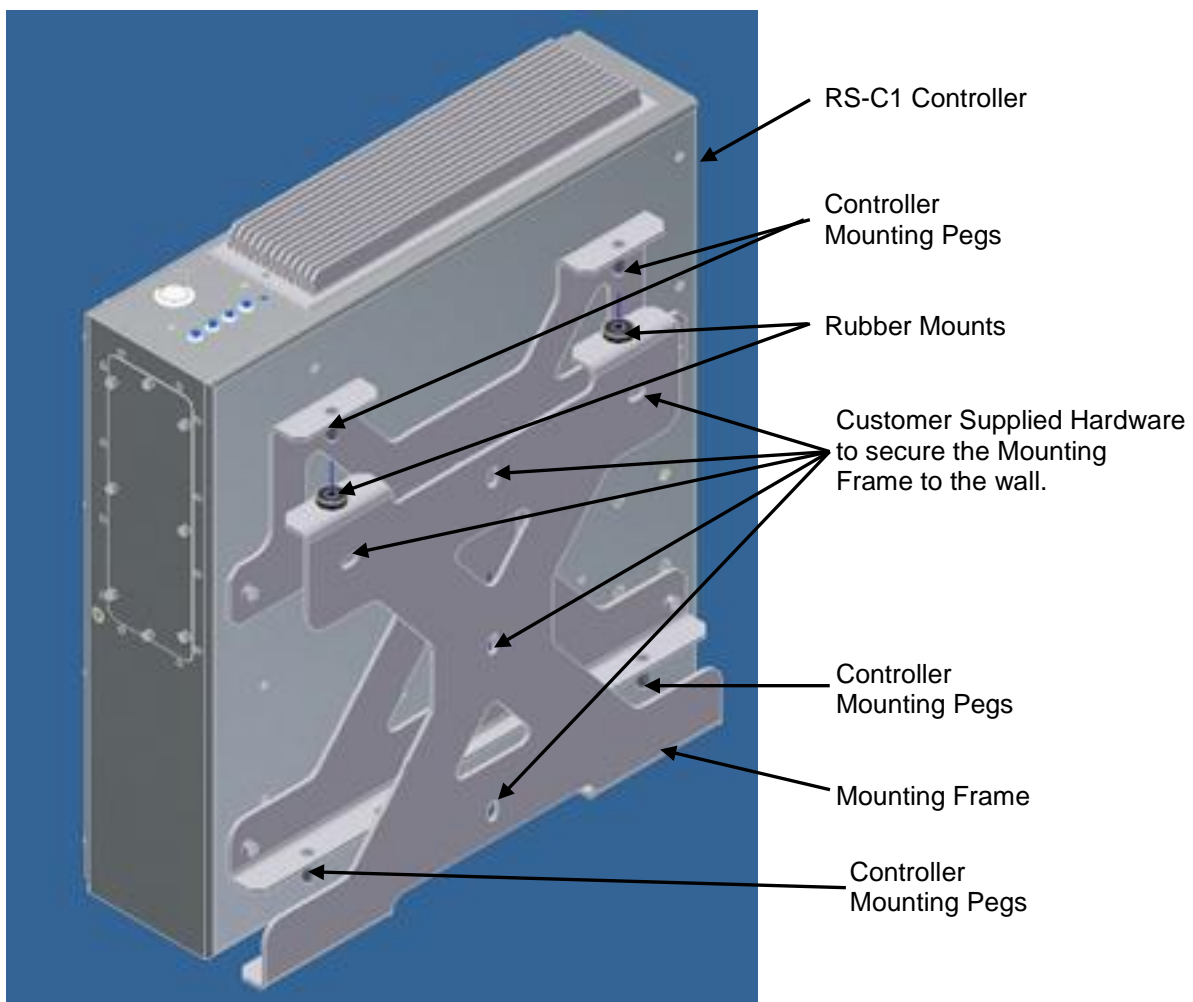
The customer chooses a location which may be predetermined by design, local codes and/or bylaws and supplies mounting hardware to mount the controller.

Note: The controller shall be mounted in a location allowing a minimum of 2 inches (50mm) of clearance around the perimeter.

The Controller is supplied with a Mounting Frame to make installation easier.

Using customer supplied mounting hardware, mount the Controller Mounting Frame in a suitable location. Ensure that the frame is square and securely mounted.

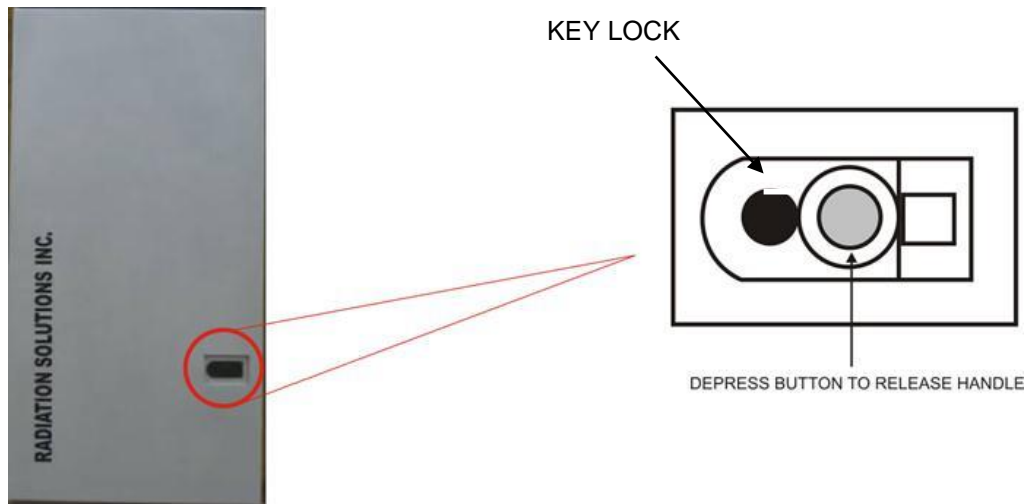
Once the frame is installed, position the Controller pegs over the rubber mounts on the mounting frame mounting brackets and slide the controller into place (gravity will hold the controller in place). Ensure the Controller is securely mounted before letting go.



4.0 System Wiring

4.1 Detector Access

The RSI detector boxes are designed for easy installation and service. The lid (cover) has a special door opening lock device that is key-locked to prevent unauthorized entry (refer to Figure). Once unlocked a button is depressed to release the single handle assembly, pulling the handle forward opens the lid.



A dual locking hinge is also incorporated, so once the door is opened, pulling it forward locks the hinge preventing the door from swinging. When installation or maintenance service is complete a simple motion unlocks the hinges and allows the door to close and lock.

4.2 Running Cable

Once the conduits are run (as detailed in [Section 2.4](#)), pull the cables through the conduit leaving at least 3 ft. at each end for termination and dressing.

RSI SUPPLIES 500ft (152m) OF CABLE WHICH IS NORMALLY MORE THAN ENOUGH. HOWEVER IF LONGER CABLE RUNS ARE REQUIRED PLEASE CONTACT RSI-SERVICE – EXTRA CABLE CAN BE ORDERED FROM RSI, BUT IF YOU CHOOSE TO ORDER FROM AN OUTSIDE SOURCE IT IS ESSENTIAL THAT 4pr SHIELDED TWISTED PAIR CABLES WITH GROUND (22AWG OR LARGER) BE USED OR SERIOUS SYSTEM ERRORS WILL OCCUR.

CABLES CAN BE SPLICED, USE JUNCTION BOXES FOR ACCESSIBILITY.



NOTE: IT IS RECOMMENDED THAT THE USER PULLS 3 CABLES THROUGH THE CONDUIT FOR THE INSTALLATION AND TO PREPARE FOR FUTURE UPGRADES:

- 1) 1 detector cable for each detector side (Det A or B) to the Controller (total of 2 cables).
- 2) 1 x CAT5/6 cable (not supplied) in case the user wants to add a CAMERA in the future.

BY PULLING THESE 3 CABLES, THE USER IS PREPARED FOR ANY FUTURE UPGRADES AS PULLING ADDITIONAL CABLES LATER IS OFTEN PROBLEMATIC.

Once the cables are run through the conduits and into the boxes, wiring is carried by the START-UP people.

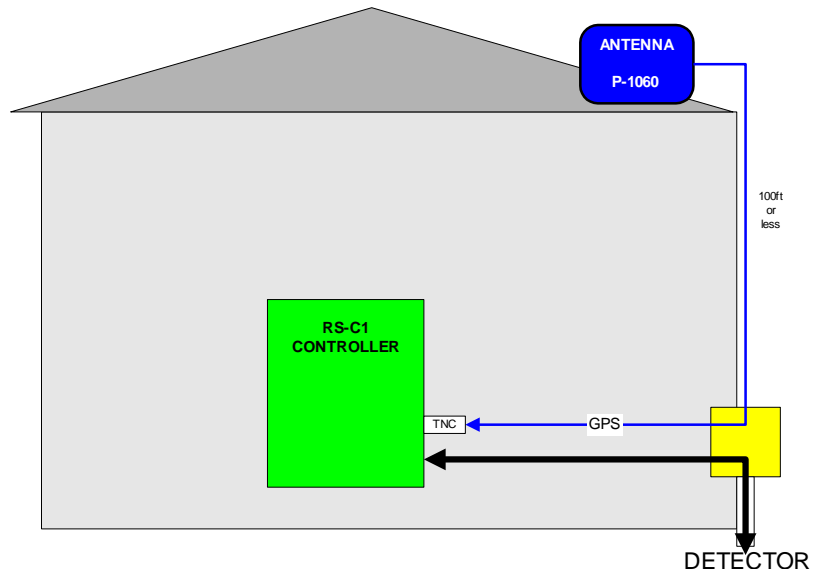
4.3 GPS Installation

A GPS system is typically supplied with the system to provide accurate event time recording. NOTE: if there are many RSI system installations **ONLY ONE NEEDS THE GPS CONNECTED** as the system can synchronize the rest.

It is highly recommended that the user install the supplied GPS system as shown in the figure below. This GPS connection gives real time location and also ensures that the system Clock is always accurate.

NOTES:

- 1) 100ft of coax is supplied with the system and is terminated at both ends in a TNC connector.
- 2) If longer cable runs are required please advise RSI-Service. Runs up to 300ft can be used but a GPS amplifier is required over 100ft to compensate for signal loss.
- 3) As shown in the figure the GPS antenna needs to see the outside world but often a nearby window is sufficient.



4.4 UPS Installation

THE RSI CONTROLLER MUST BE CONNECTED TO A USER SUPPLIED UPS SYSTEM TO PREVENT VOLTAGE SPIKES AND PROTECT THE SYSTEM IN CASE OF POWER LOSS.

RSI usually does NOT supply the UPS as in practice most users have a UPS on site and/or local plant rules specify special UPS units to be used.

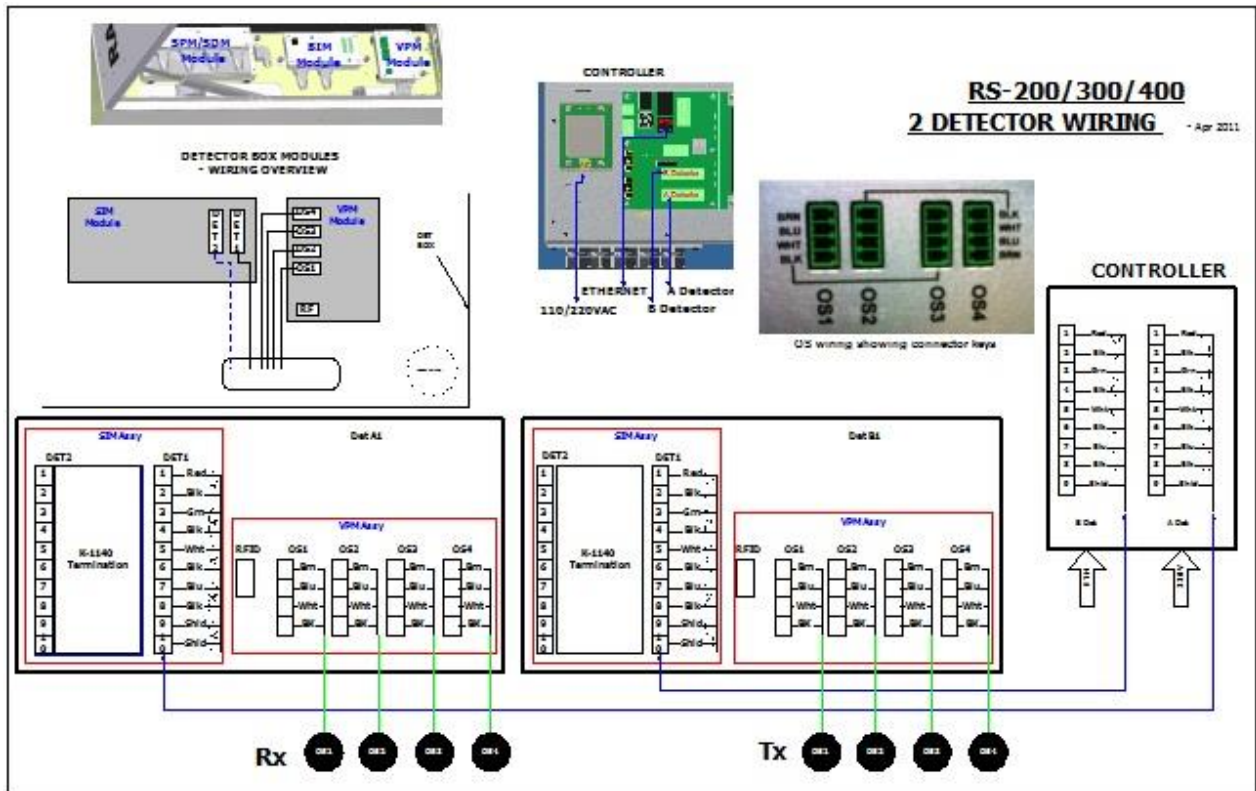
DO NOT CONNECT THE UPS TO THE POWER AT THIS TIME – DO NOT CONNECT THE CONTROLLER TO POWER AT THIS TIME.

The Controller unit is supplied with a pre-wired AC cable with a standard North American connector but European units are shipped with 5 spare Euro AC cables permitting local installers to change as required.

4.5 TLC Installation

NOTE: The TLC is an optional item and is not supplied for all installations – contact RSI-Service or your local Sales contact if this item is required. Refer to [Appendix Z](#) for Contact Information.

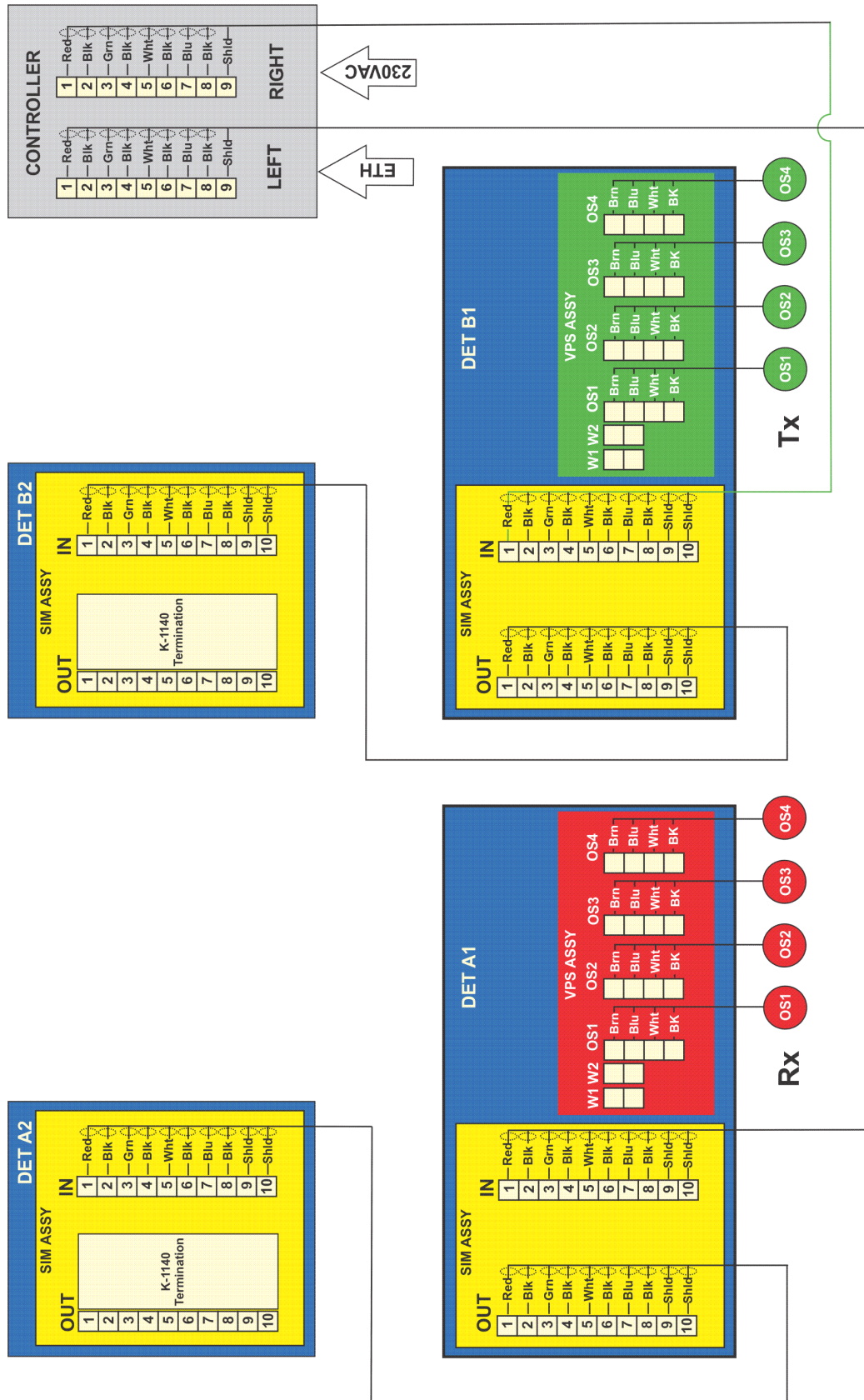
4.6 System Schematic – 2 Detector System Wiring



Refer to PN **P-1327.xx.xx** - RS-200-300-400 - Steel - START-UP Manual for detailed information.

4.7 System Schematic – 4 Detector System Wiring

Refer to PN **P-1327.xx.xx** - RS-200-300-400 - Steel - START-UP Manual for detailed information.



Appendix Z – WARRANTY



Radiation Solutions Inc. Warranty

RSI products are provided with a two (2) year return to factory limited warranty against defects in materials and workmanship from the date the Products are placed at the disposal of the Buyer at the named place of delivery. The warranty does not cover damage caused by improper use or unauthorized repairs.

Repairs of defects will be performed by RSI at no charge to the Buyer, subject to the limitations when the unit is returned to the factory. To request warranty service, the Buyer must call RSI's service coordinator for a return material authorization (RMA) number.

The Buyer is responsible for all the shipping, customs clearance costs and risk of loss of returning the repaired or replaced Products to the Buyer. RSI will own all parts removed from repaired Products or all Products replaced.

RSI's warranty does not include mechanical damage to the detector from handling or abuse. RSI does warrant the detectors to be complete and fully operational to their published specifications at the time of delivery and to maintain the minimum resolution and performance for a period of two years under normal operating condition.

The radiation monitoring system is warranted by RSI to perform correctly if it is installed and operated according to RSO directions. However system operation is limited by basic physics so RSI does NOT warrant 100% detection capability but does warrant that if the system is installed and operated correctly then these systems are technically more advanced than any other similar system on the market and has the highest probability of alarming.

Complete details of the "***Standard Terms and Conditions***" may be obtained by contacting RSI.

For more information or to make a warranty claim contact RSI.

Contact Information

Radiation Solutions Inc.
386 Watline Ave
Mississauga, ON, L4Z 1X2
Attn: Sales Manager

Phone: (905) 890-1111
Fax: (905) 890-1964
Email: service@radiationsolutions.ca
sales@radiationsolutions.ca

Addendum A – Engineering Drawings

The following is a list of Engineering Drawings to support the installation of the Steel Portal System (RS-200/300/400) and components.

P-1326	RS-300 Generic Site Layout
P-1325 (3 sheets)	Installation Drawing
M-1131 (2 sheets)	RS-200/300 – 3000ci Detector Stand Detail
M-1235	RS-200-1500ci Detector
M-1234	RS-200-1500ci detector – 2 legs
M-1123	RS-400-5000ci Detector

Note: RSI tries to maintain this document to the latest revision but because of product improvement and changes due to customer requirements the following Engineering Drawings may change without notice. The revision levels of the following documents are current for this build please contact RSI for any updates prior to installation.