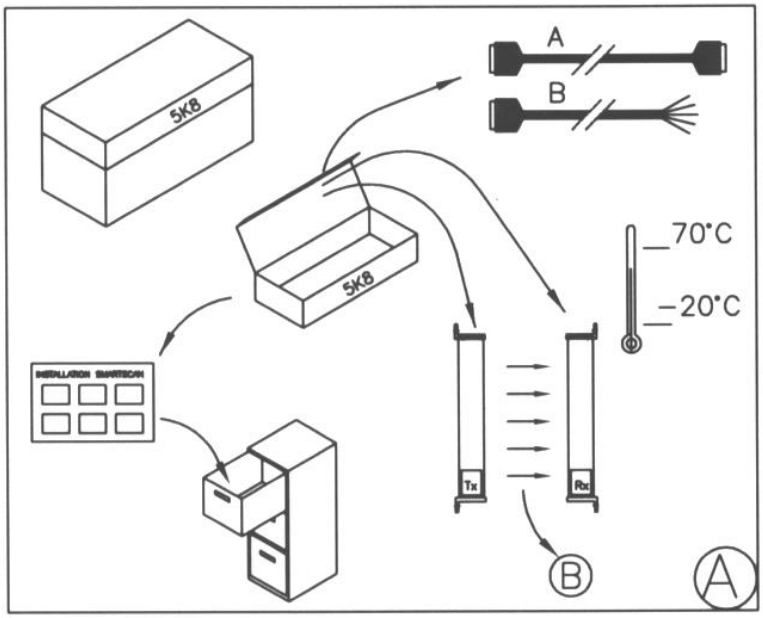
5K8 Series Safety Light Curtain
Installation Sheet (CD339/060711)

Figure A Unpacking

- Remove all packaging material and retain it
- Locate and keep the delivery note
- Inspect all items for transit damage
- Match goods supplied to those specified on the delivery note
- Keep the Installation Sheet in a safe place



Each 5K8 system supplied would normally include:

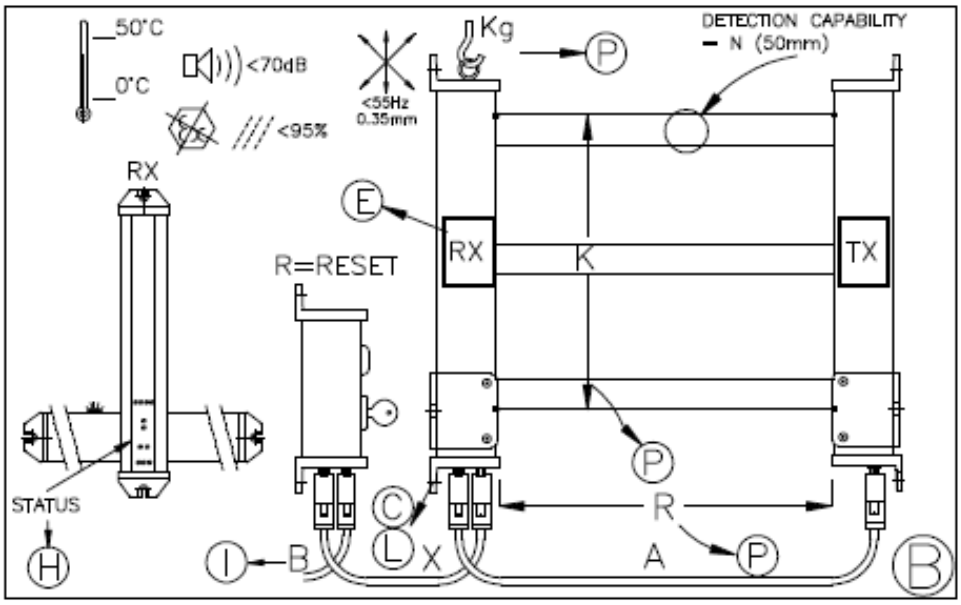
- Light curtain
- Cables (A) and (B)
- Installation sheet
- Service questionnaire form

Storage requirements

- Humidity - <95%
- Temperature range between -20° C and +70°C

Figure B Operating Requirements

- Humidity <95%
- Temperature range between 0 and 50 degrees C
- Vibration frequency <55Hz max. Displacement <0.35mm
- Equipment should not be used in potentially explosive atmospheres. The units are not 'EX' rated. Do not use the equipment in explosive atmospheres. For further information on explosive-proof enclosures contact Smartscan Ltd.
- Noise generated by the equipment will never exceed 70 dB



K - Detection zone width
R - Scanning range of the light curtain

Detection zone width (K) – Must be of a suitable height for each application to prevent personnel access to the danger area either over, under or around the light curtains detection zone.

Range (R) – Ensure the particular light curtain specification is capable of satisfying the range requirement for the application.

Fig. B also shows the connection points for the three different cable options used with the 5K8 series.

The A (Interconnect) cable has two 25 pin D connector sockets and is connected between the transmitter (TX) and the receiver (RX) head of the 5K8 series.

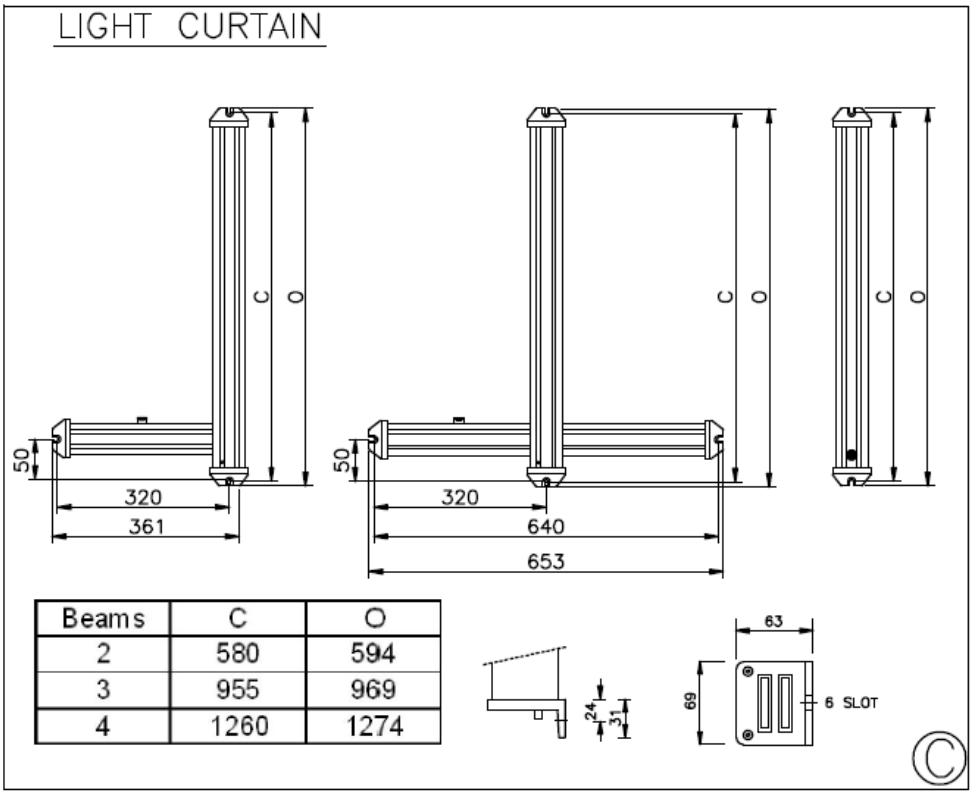
The B (User) cable has one 25 pin D connector plug at one end with the other end consisting of the colour coded wires for the end user to interface into the machine control system. The B (User) cable is either connected directly onto the receiver head or to the reset station if used.

The X Cable is required if the user has opted to use a Smartscan reset station. The X cable has two 25 pin D connectors with one end having a socket and the other end with a plug. The cable is interfaced with the socket end connected to the Reset station and the plug end connected to the receiver head of the 5k8 series.

Since the X cable is a 25 pin D type connector with a Plug and Socket, the X cable can also be used as an extension cable for either A (Interface) cable or the B (User) cable.

To ensure correct operation of the system cable lengths as stated should not be exceeded: A cable = 50 metres. B cable = 50 metres. X cable = 10 metres

Figure C Mounting and Dimensional Information



Beams	C	O
2	580	594
3	955	969
4	1260	1274

The 5K8 series safety light curtain is supplied with mounting brackets fitted as standard. The mounting brackets are located at the ends of the light curtain as shown above and 6mm bolts should be used to mount the light curtain in position.

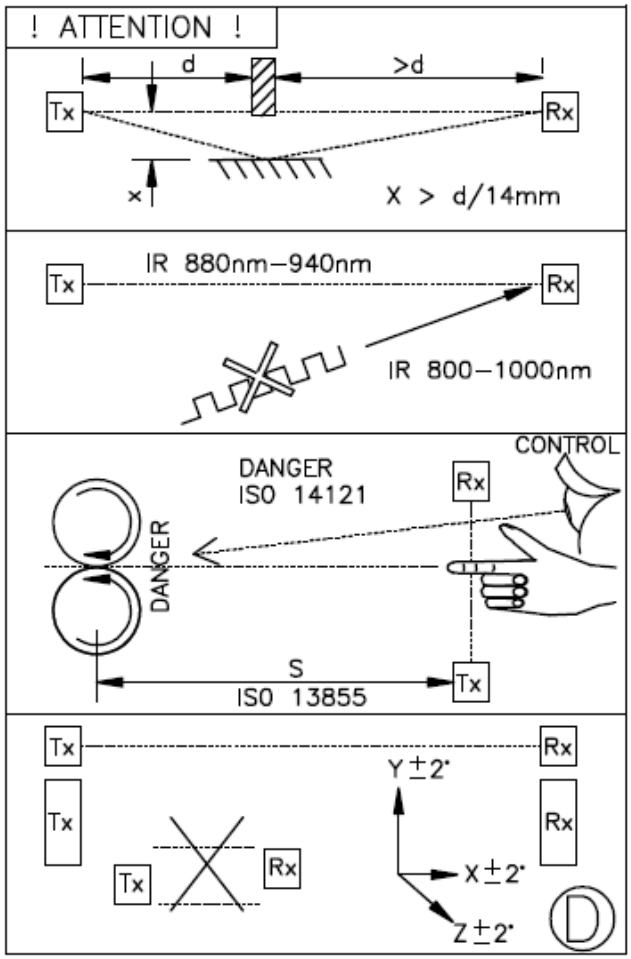
The table above provides useful mounting measurements for the L, inverted ‘T’ and the straight light curtain.

C = Mounting centres
O = Overall Length

Figure D shows 5K8 Series light curtain end-bracket dimensions. Use M6 bolts for the mounting brackets.

1. Consider reflective surfaces that may give rise to an optical 'short circuit' from the direct path of the light curtain's infrared beams as shown in the first illustration of Fig. D. To ensure the light curtain is mounted far enough away from reflective surfaces use the formula provided to calculate the minimum distance (X) between the light curtain and reflective surface.

2. To prevent intermittent tripping of the light curtain ensure that extraneous infrared energy between 800 and 1000 nanometres is not directed towards the Perspex window of the receiver unit (RX). Extraneous sources would include infrared sensors, infrared remote controls or scanning systems.

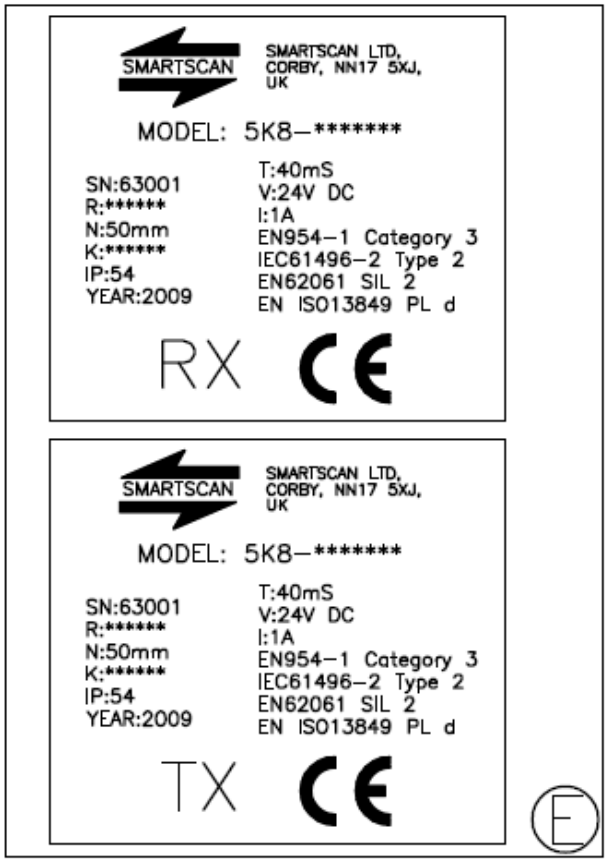


3. Ensure the mounting position of the light curtain in respect to the nearest danger point meets the requirements of European Standard ISO 13855. See Appendix 1.

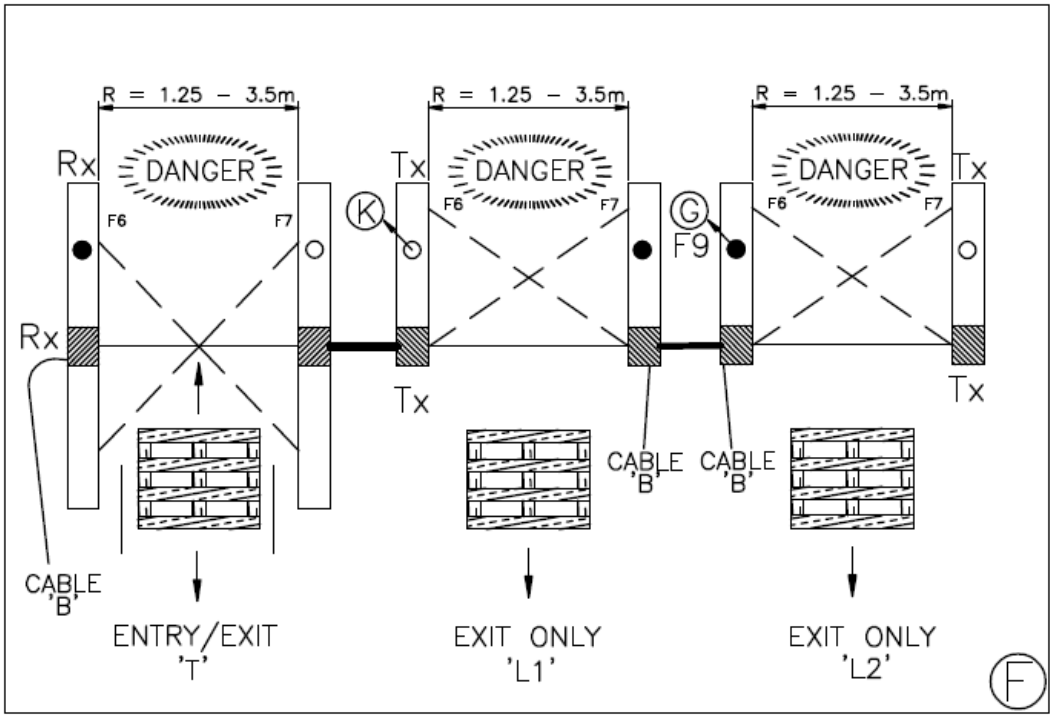
4. Ensure the light curtain transmitter (TX) and receiver (RX) units are mounted accurately in-line with each other and are both perpendicular and parallel to each other within the parameters shown for each axis.

5. If utilising mirrors to deflect the light curtain ensure the mirror length is 50mm longer at either end of the light curtain detection zone width and mounted centrally to the zone. To ensure reliable operation the light curtain deflection angle (A) from the mirror must not be less than 40 degrees or greater than 100 degrees.

Figure E shows examples of the identification labels that are affixed to the transmitter (Tx) and receiver (Rx) columns.



When installing a Smartscan 5K8 Series light curtain your attention is drawn to the following: (**Figure F**)



The inverted T 5K8 series light curtain is also known as an entry/exit system. This system is normally used between two zones (machines) allowing transfer of the pallets from one zone to the other. The horizontal mute module provides 2 muting beams at either end of the mute module transmitting infra red mute beams diagonally across to the receiver side forming a cross beam muting arrangement.

The system works by the square pallet load moving into the two mute beams and interrupting them. The two mute beams are monitored with a disparity timer of two seconds to provide a mute initiation of the light curtain.

The L shaped 5K8 series light curtain is also known as the exit only system. There are two types of 'L' available, right hand (L1) and left hand (L2). The Left or right hand indicates where the User B cable is connected as shown above. You will note that the mute cross beams are arranged on one side of the light curtain. They function in the same format as the T shape explained above. The cross beams must always be on the Danger side and therefore the pallet can only travel in one direction moving away from the danger to the safe side of the machine.

It is a control requirement for the 5K8 series that an additional 3rd mute input is provided via the conveyor run signal. This signal acts as a permissive signal to the cross beam mutes and/or external mute input signals.

Figure G shows the functions table for the 5K8 series

FEATURE	ON	OFF	RATING	
F1	CLOSE	OPEN	110V 2A	* SAFETY OUTPUTS
F2	CLOSE	OPEN	110V 1A	** STATUS OUTPUT
F4				MONITORING OUTPUT
F5			10mA	MONITORING INPUT
F6			10mA	MUTE 1
F7			10mA	MUTE 2
F8	OPEN	CLOSE	24VDC 0.5A	** MUTE OUTPUT
F9	BLUE LAMP			INDICATOR MUTE LAMP ON
F10			10mA	MUTE ENABLE
F11			10mA	OVERRIDE
F13			10mA	ACTIVATE
F14	GREEN			INDICATOR LIGHT CURTAIN CLEAR
F15	YELLOW			INDICATOR MUTE 1 CLEAR
F16	YELLOW			INDICATOR MUTE 2 CLEAR
F17	RED			INDICATOR LIGHT CURTAIN BLOCKED
F18	GREEN		F1	INDICATOR SAFETY ON
F19	RED		F2	INDICATOR SAFETY OFF
F20	YELLOW		F3	INDICATOR STATUS RELAY OFF
F21	YELLOW		F4	INDICATOR MUTE ON
F22	RED			INDICATOR TRANSMITTER OK
F23	RED			INDICATOR ACTIVATE
F24	RED			INDICATOR EDM
F25	RED			INDICATOR MUTE ENABLE

*ELESTA SGR 2827 **BT 47W/7

G

Safety Outputs (F1) – 5K8 series safety light curtains have cross-monitored output switching relays mounted inside the receiver column. The output relays provide two safety ‘volt free’ forcibly guided switching contacts which are internally connected to the wires in the multi-core user cable ‘B’ as follows: OSSD1 (Output 1): orange (OR) and pink (PK). OSSD2 (Output 2): turquoise (TU) and grey (GY). Maximum contact switching power 24V DC, 2A or maximum 110V AC, 2A.

Status Output (F2) - Relay provides one non-safety ‘volt free’ switching contact which is internally connected to the wires in the multi-core user cable ‘B’, wires red (RD) / black (BK) and red (RD) / brown (BN). The switching relay contacts are ‘normally open’ outputs from this relay and should only be used for non-safety applications. Maximum switching power 110V, 1A. The status relay activates when the safe output relays (F1) turn ON and de-activates when the safe outputs (F1) turn OFF.

EDM (F4 & F5) (SMM OUT & SMM IN) - An **E**xternal **D**evice **M**onitoring contact signal is provided for the user to monitor external switching devices. This is to ensure those devices respond in unison with the safety outputs (F1) each and every time the light curtain is interrupted.

The green (GN) (cable B) wire should be connected to a N/C contact of the device being monitored. The other side of the EDM switch contact should be

connected to the green (GN) / red (RD) wire. If the EDM function is not required for a particular application it is necessary to link the green (GN) wire to the green (GN) / red (RD) wire. If the link is not fitted the safety system will trip and it will not be possible to reset the light curtain.

Mute inputs M1 (F6) and M2 (F7) - Mute inputs M1 (mute 1) yellow (YE) wire and M2 (mute 2) white (WH) wire are for connecting external muting signals to the 5K8 safety light curtain. The input signals should come from separate sources, so that a single fault cannot cause a failure of the protective function.

Note: These are for external mute inputs, e.g. inductive loops. When using a self-muting 5K8 system e.g. inverted 'T' shape they are not available.

When using the two external mutes the two mute signals are monitored via the two second mute disparity timer.

Mute output (F8) – The customer may need an additional mute lamp indication on the machine as a visual warning for the operator. Connection of a mute indicator lamp can be made by the wires in the B user cable. Connect the yellow (YE) / blue (BU) wire to one side of the mute lamp and the other side of the mute lamp is connected to +24V DC. Maximum switching current rating is 500mA.

Mute lamp output (F9) – This lamp is integrated within the horizontal muting arm of the light curtain. The lamp acts as a visual warning indicator and will be illuminated during a mute condition, i.e. pallet transfer.

Mute enable input (F10) – It is a control requirement for the 5K8 series that an additional 3rd mute input is provided via the conveyor run signal so as to maintain a high level of safety integrity. This signal acts as a permissive signal to the cross beam mutes and/or external mute input signals.

Connection of the 3rd mute input is via the red (RD) / blue (BU) wire to a normally – open (N/O) 'volt free' contact to 0V DC. Contact closed when conveyor running.

Guard Override (F11) – providing the light curtain is in a tripped condition and the curtain is blocked by a loaded pallet then turning and holding the activate switch (spring return) to ON will automatically turn-on the safety outputs (F1), for a maximum period of 3 minutes. As soon as the loaded pallet clears the light curtain the safety system will automatically reactivate to a 'fully guarded' condition and the spring return switch can now be released.

The Activate and Guard Override inputs are available from the user (B) cable. The yellow (YE) / red (RD) is connected to a normally open switch contact and the other side of the switch is connected to 0V DC.

Activate (F13) - A push button or key switch is required, having a N/O switch contact. Connect the blue (BU) wire from the user cable (B) to one side of the switch and the other side of the switch to L- (0v dc).

Manual Restart - Turning the 'activate' switch to ON and then releasing the switch will automatically turn on the safety outputs (F1), providing the light curtain is clear of obstruction.

(RX) Light curtain 'clear' indicator (F14) - A green LED indicator mounted on the receiver unit illuminates when the light curtain is clear of obstruction.

Mute 'clear' indicators M1 (F15) and M2 (F16) - Amber LED indicators mounted on the receiver unit extinguish independently, when mute sensors M1 and M2 are blocked.

(RX) Light curtain 'block' indicator (F17) - A red LED indicator mounted on the receiver unit illuminates when the light curtain is obstructed.

Safe output 'on' (F18) - A green LED indicator mounted on the receiver unit illuminates when the signal output switching relays are ON.

Safe output 'off' (F19) - A red LED indicator mounted on the receiver unit illuminates when the signal output switching relays are OFF.

Status output indicator – (F20) – An amber LED indicator mounted on the receiver unit is illuminated when the status relay is de-energised, but extinguishes when the status relay is on.

Mute condition 'On' indicator (F21) - Amber LED indicator mounted on the receiver unit illuminates when the light curtain output relays are in a muted condition.

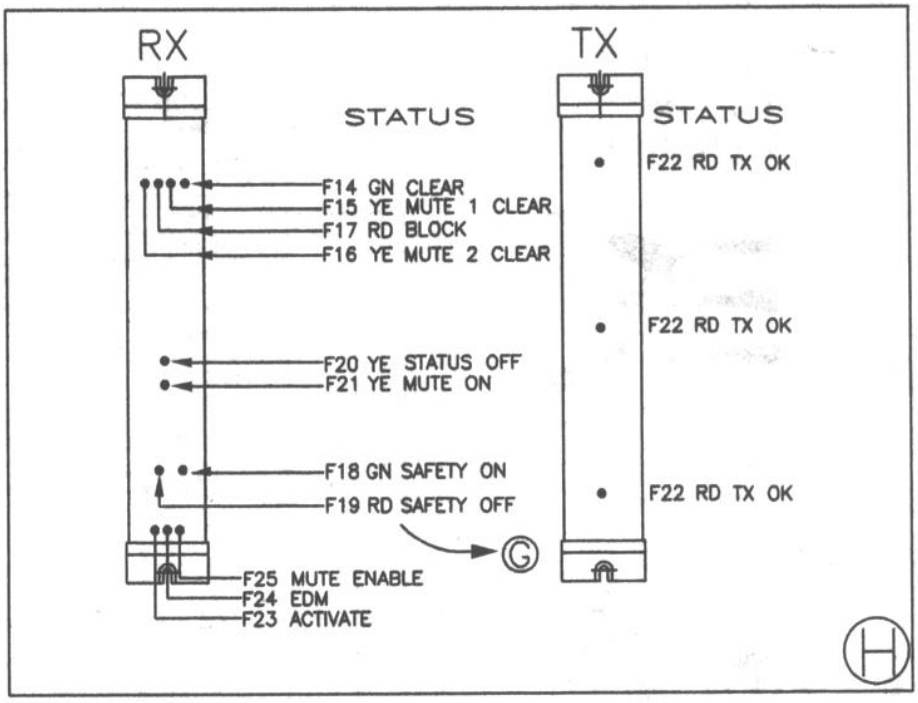
(TX) transmitter diode on indicators – (F22). A red LED corresponding to each transmitter diode is illuminated when each transmitter is operational.

Activate 'On' indicator – (F23). A red LED mounted on the receiver unit to indicate reset switch activation.

EDM 'On' indicator – (F24). A red LED mounted on the receiver unit illuminates when an EDM signal is present.

Mute Enable (ME) 'On' indicator – (F25). A red LED mounted on the receiver unit illuminates when a mute enable (conveyor run) signal is present.

Figure H shows a diagrammatic arrangement of all the function LEDs and location on the 5K8 series safety light guard. See Fig. G above for a detailed explanation.



LED Status Indicators on the R/X

F14 Green Guard Clear
F15 Yellow Mute 1 Clear
F17 Red Guard Blocked
F16 Yellow Mute 2 Clear

F20 Yellow Status relay off (Auxiliary / Non-safety Output)
F21 Yellow Mute on

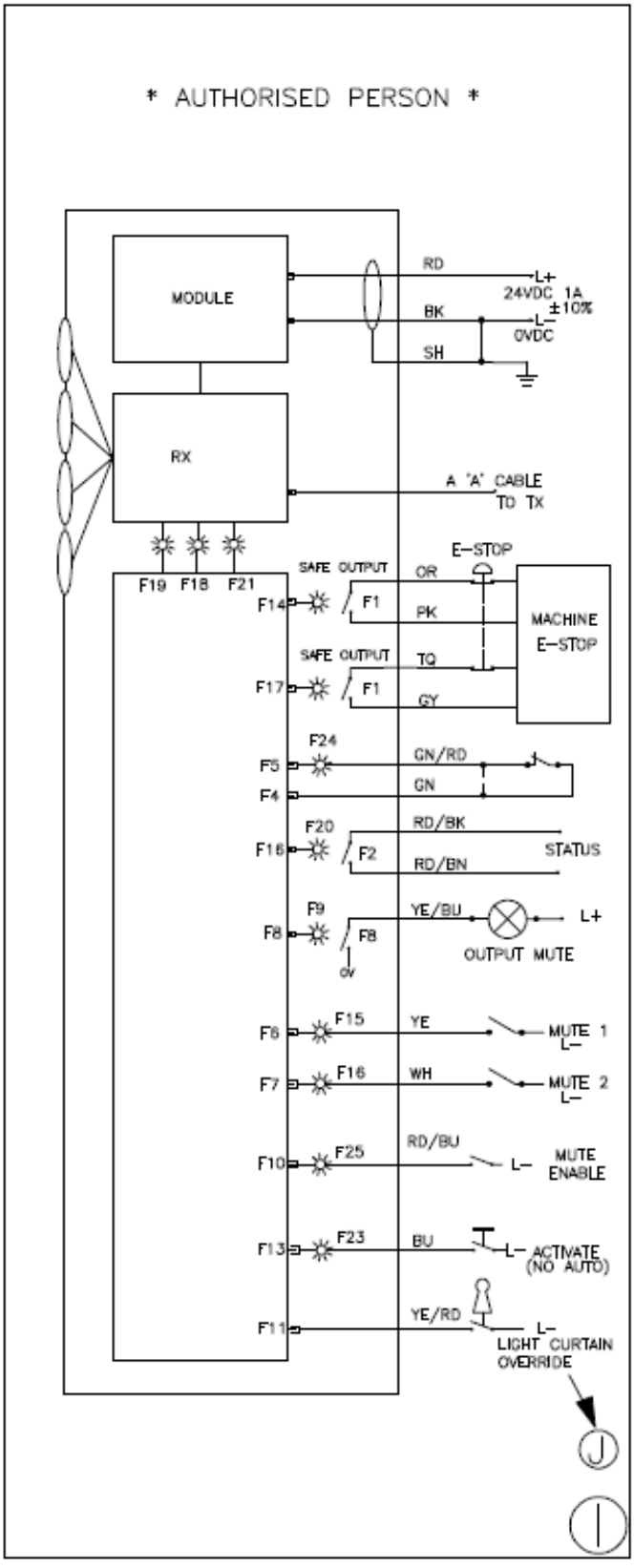
F18 Green Safety outputs on
F19 Red Safety outputs off

F25 Red Mute enable on
F24 Red EDM on
F23 Red Activate on

LED Status Indicators on the T/X

F22 Red Beam(s) transmitting

Figure I shows all the input and output connections to and from the 5K8 series. The drawing also shows the wire colour coding. Please see Appendix 2 for examples of typical 5K8 series wiring configurations.



Power supply - Use a regulated supply +24V DC, 2A ±10%. Protect the +24V input with a 1.5A fuse. Connect the power supply to cable B as follows: The red (RD) wire to +24V DC and the black (BK) wire to L- V DC. Connect the screen to ground.

Note: Prior to initial power up of the light curtain check the following:

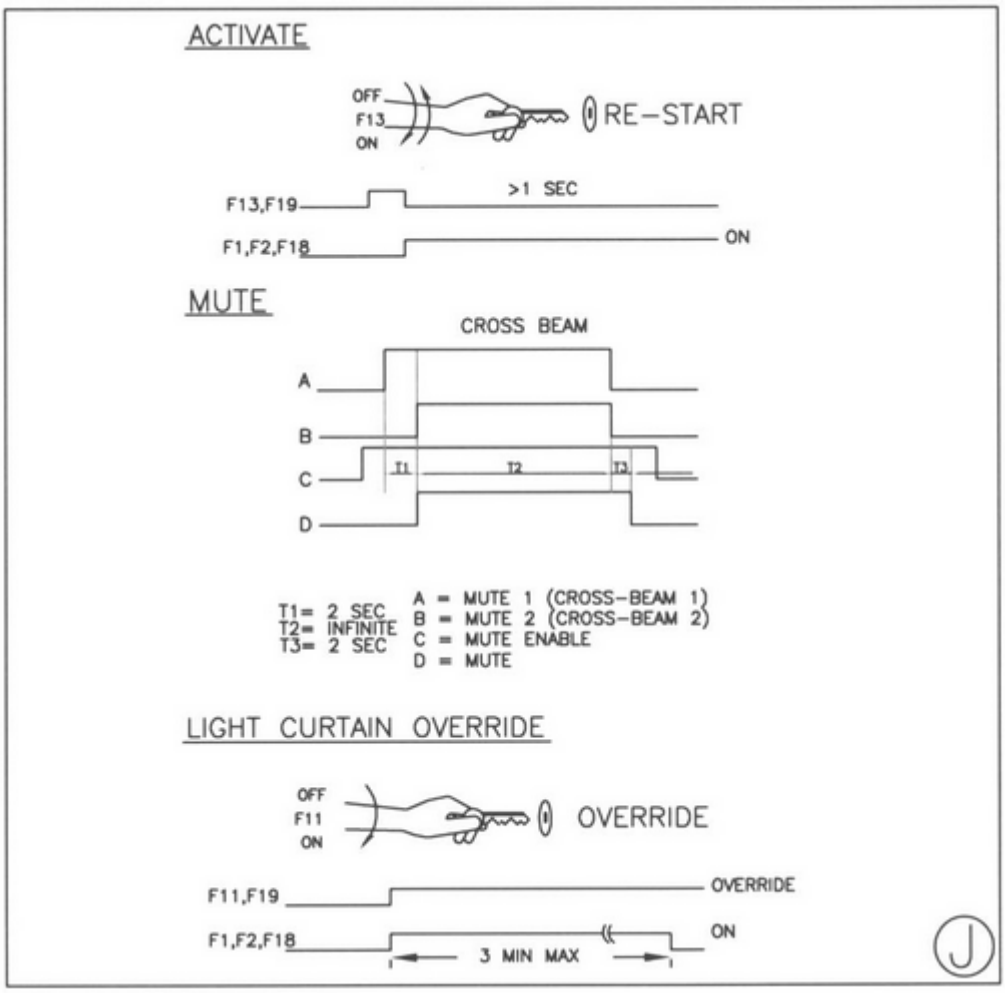
If the Smartscan system is connected directly to a 24V DC source supplied by the user, it must be emphasised that the supply should be regulated and suppressed to prevent transient voltages and other forms of electrical interference from affecting correct operation of the Smartscan equipment.

Note: Prior to initial power up of the light curtain check the following:

- Red (RD) / blue (BU) wire '***mute enable***', is connected to 0V DC via a 3rd mute signal, e.g. conveyor run.
- EDM. Is connected across the N/C contact of the FSD. If not used link the green (GN) wire to the green (GN) / red (RD) wire.

All input and output connections from the Smartscan 5K8 Series are via a plug connected into the Receiver (RX) head – Cable B (User).

Fig J shows the standard timer functions used in the 5K8 Series for muting and guard override applications. The timers used in cross-beam muting are also shown below.



T1 (Mute Disparity Time) – The maximum time allowed between activation of signals mute 1 (M1) and mute 2 (M2). This is set at 2 seconds.

T2 (Mute Time Out Period) - No overall mute timeout, (infinite).

T3 (Mute Off Delay Time) - A predetermined time that the light curtain will remain in a muted condition following de-activation of one or both of the mute signals. This is set at 2 seconds.

It is assumed that the Mute enable signal is energised during the entire pallet transfer process.

Fig. K shows the on-board dip switches for user to set the light curtain in either automatic or manual start-up. It is supplied factory set to manual restart mode.

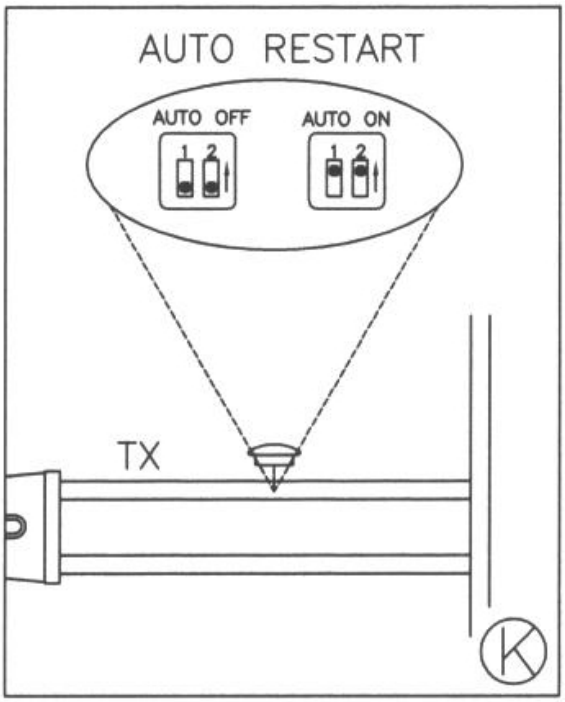


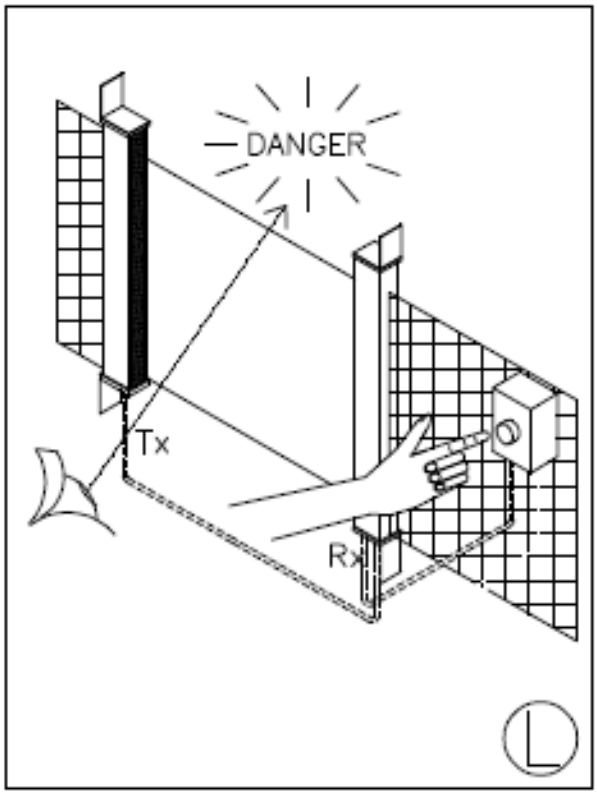
Figure L Activate and Guard Override Functions

Manual Restart - At power-up or, following a tripped condition, the activate switch is used to restart (reset) the output relays to an ON state. The switch must be activated and released to enable a restart condition.

The reset switch must be located so that the operator cannot reset the light curtain from inside the dangerous area. In addition the reset switch must be positioned so that the operator can see that the dangerous area is safe / free of personnel before resetting the machine.

Guard Override - This function should only be used when using the light curtain to transfer pallet loads from one zone to another.

If the safety system trips when a pallet load is interrupting the sensing field of the light curtain the safety system cannot be restarted. In order to remove the blockage from the light curtain the 5K8 series provides a guard override facility. This is achieved by activating and holding the guard override switch until the blockage has cleared the sensing field of the light curtain. The maximum time permitted for this is 3 minutes. However if the time is inadequate the process can be repeated by simply releasing the active switch and re-activating and holding the switch again. The guard override switch can be a push button, preferably a key switch of the type ‘spring return’.



Please note that the light curtain’s safety outputs (OSSDs) can only be reset once the light curtain sensing field is free of the obstruction. Therefore the override function is only available whilst a pallet load is blocking the sensing field of the light curtain.

The Restart controls must be located such that the danger area can be seen to be clear of persons before the system is activated.

Figure M Test and Maintenance

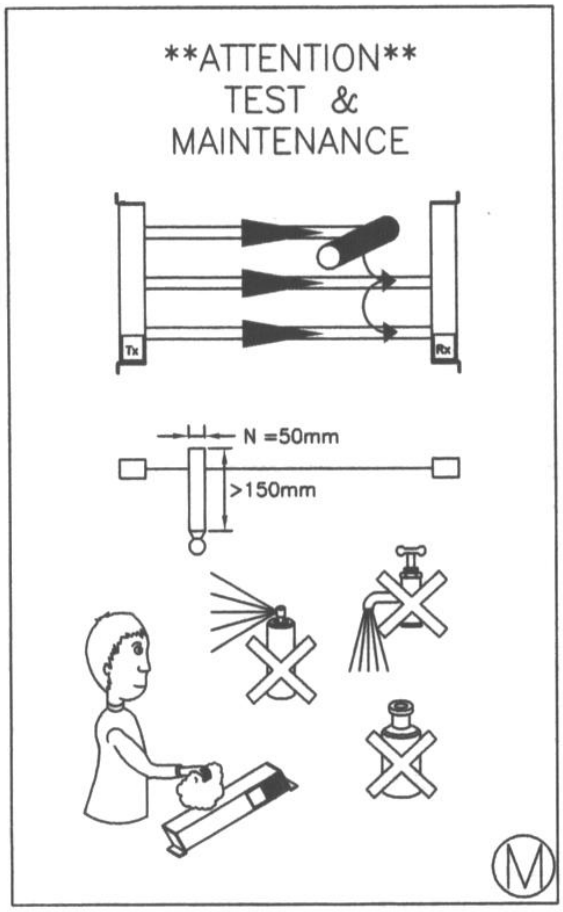
Power-up the light curtain and activate the output switching circuits to an ON condition.

Insert a test piece of appropriate size into the top light beam, 150mm from the transmitter unit. At this point the output switches will turn OFF as the test piece totally obscures the beam.

Repeat this process through each of the beams in the light curtain.

Ensure that while the test piece is obscuring each beam the output switches are OFF.

The test procedure should be carried out frequently as indicated by the risk assessment for the particular installation. Smartscan Ltd recommends the test should be carried out daily.



The Transmitter (Tx) and Receiver (Rx) windows should be cleaned regularly as indicated on the Installation Sheet.

Dirt build up on the windows may lead to intermittent tripping or a totally blocked condition of the light curtain. Clear adhesive tape may be applied to the windows of curtains in dirty or abrasive conditions. Renew the clear adhesive tape periodically.

Clean the windows with a clean damp cloth using a mild detergent. Never use abrasive, corrosive cleaners or spray detergents.

Figure N shows an operations chart for the 5K8 series.

- Before installation read and understand the Installation Sheet provided paying particular attention to the information provided in Figure D.
- Refer to Figure M for test and maintenance procedures.
- Every 24 hours carry out tests as indicated in Figure M.
- Every 6 months check the entire installation paying particular attention to Figure D.
- If the equipment fails to operate as intended check the electrical connections as shown in Figure I.

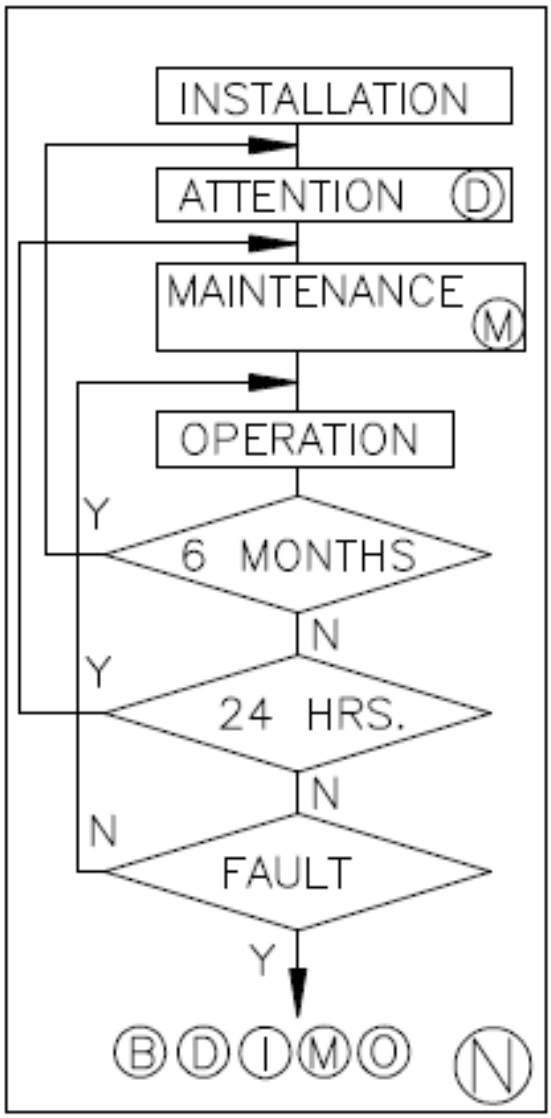
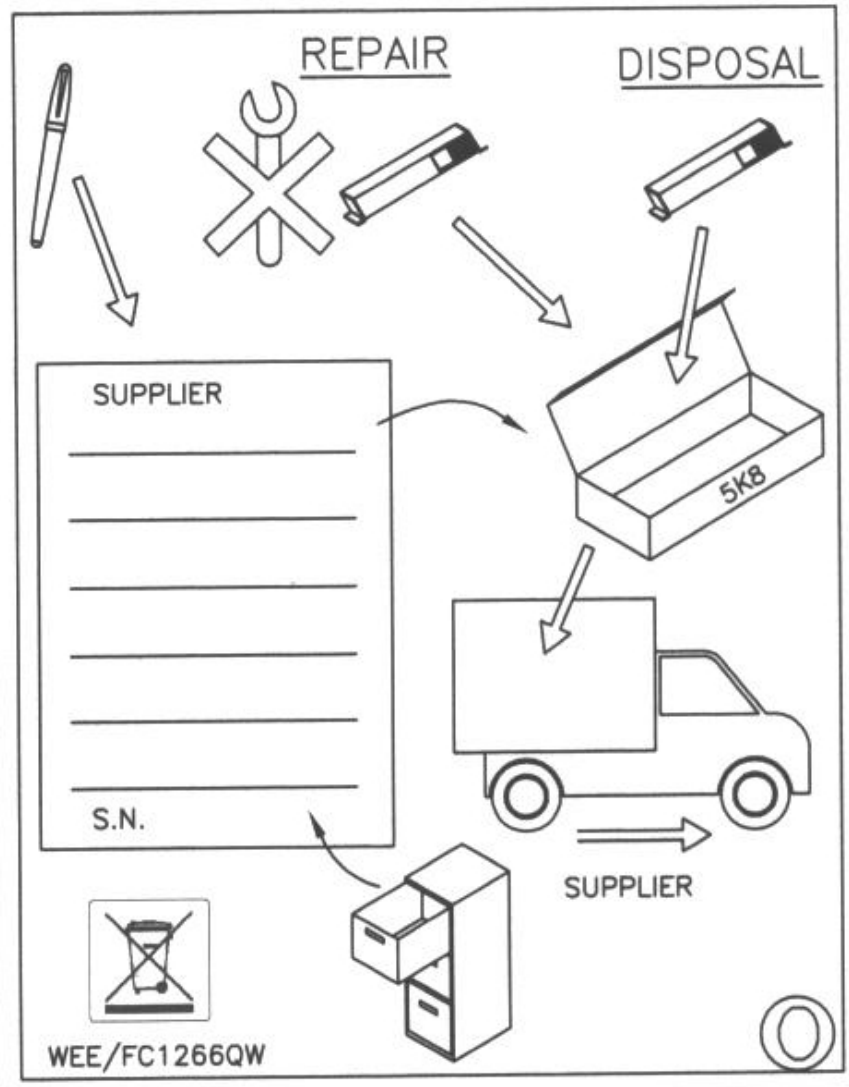


Figure O outlines the procedure for returning a Smartscan product.

If a fault occurs that cannot be resolved or the equipment is damaged return the system to the nearest Smartscan distributor or Smartscan Ltd. Indicate the nature of the fault and the symptoms displayed on the form provided.



Returned guards must be matching serial number pairs. This is to ensure that the Service department can carry out a full and proper inspection of the returned light curtain system.

Figure P shows a list of the model numbers and cable types. It describes the detection zone width (K), the maximum scanning range and weights for the 5K8 series.

Model No.	K (mm)	R (m)	Kg
5K8-502AP	500	0.5 - 15	3
5K8-502APED	500	4.0 - 40	3
5K8-502APT	500	1.25 - 3.5	3.7
5K8-502APL1	500	1.25 - 3.5	3.2
5K8-502APL2	500	1.25 - 3.5	3.2
5K8-903AP	900	0.5 - 15	3.7
5K8-903APED	900	4.0 - 40	3.7
5K8-903APT	900	1.25 - 3.5	4.7
5K8-903APL1	900	1.25 - 3.5	4.2
5K8-903APL2	900	1.25 - 3.5	4.2
5K8-1204AP	1200	0.5 - 15	4.7
5K8-1204APED	1200	4.0 - 40	4.7
5K8-1204APT	1200	1.25 - 3.5	5.7
5K8-1204APL1	1200	1.25 - 3.5	5.2
5K8-1204APL2	1200	1.25 - 3.5	2.2

CABLES

Model No.	Type	L (m)
5A005008XX	A	1 - 50
5BXX	B	1 - 50
5XXX	X	1 - 10

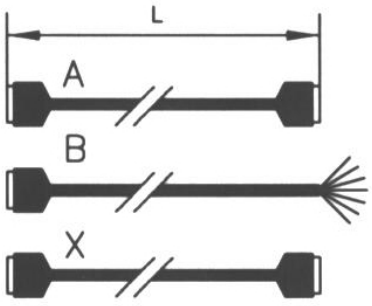


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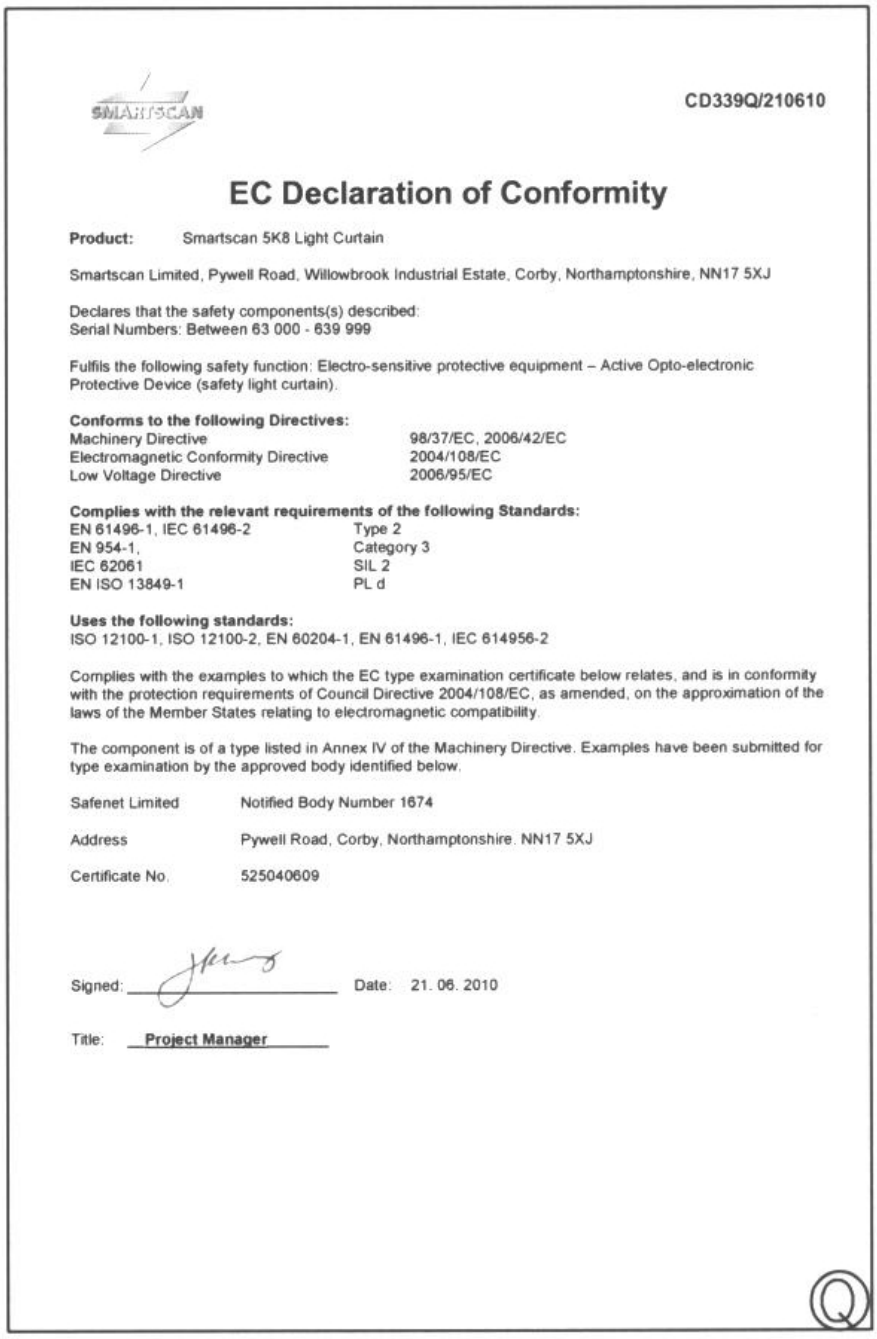
Figure Q shows a copy of the 5K8 series declaration of conformity.



CD339Q/210610

EC Declaration of Conformity

Product: Smartscan 5K8 Light Curtain

Smartscan Limited, Pywell Road, Willowbrook Industrial Estate, Corby, Northamptonshire, NN17 5XJ

Declares that the safety components(s) described:
Serial Numbers: Between 63 000 - 639 999

Fulfils the following safety function: Electro-sensitive protective equipment – Active Opto-electronic Protective Device (safety light curtain).

Conforms to the following Directives:

Machinery Directive	98/37/EC, 2006/42/EC
Electromagnetic Conformity Directive	2004/108/EC
Low Voltage Directive	2006/95/EC

Complies with the relevant requirements of the following Standards:

EN 61496-1, IEC 61496-2	Type 2
EN 954-1,	Category 3
IEC 62061	SIL 2
EN ISO 13849-1	PL d

Uses the following standards:
ISO 12100-1, ISO 12100-2, EN 60204-1, EN 61496-1, IEC 614956-2

Complies with the examples to which the EC type examination certificate below relates, and is in conformity with the protection requirements of Council Directive 2004/108/EC, as amended, on the approximation of the laws of the Member States relating to electromagnetic compatibility.

The component is of a type listed in Annex IV of the Machinery Directive. Examples have been submitted for type examination by the approved body identified below.

Safenet Limited	Notified Body Number 1674
Address	Pywell Road, Corby, Northamptonshire. NN17 5XJ
Certificate No.	525040609

Signed: _____ Date: 21. 06. 2010

Title: **Project Manager**

Q

Figure R provides a glossary of words and terminology used in the Installation Sheet in a number of International languages:

GLOSSARY ENGLISH	GLOSSAIRE FRANCAIS	GLOSSAR DEUTSCHE	GLOSSARIO ITALIANO	GLOSARIO ESPAGNOL	ORDLISTA SVENSKA	ORDBOG DANSK	BIBLIOGRAFIE DUTCH
ACTIVATE	ACTIVER	AKTIVIEREN	ATTIVASIONE	ACTIVAR	ACTIVERING	AKTIVERE	ACTIVEREN
ATTENTION	ATTENTION	ACHTUNG	ATTENZIONE	ATENCION	OBSERVERA	ATTENTION	ATTENTIE
AUTHORISED PERSON	PERSONNE AUTORISEE	AUTORISIERTE PERSON	PERSONALE AUTORIZZATO	PERSONA AUTORIZADA	BEHORIG PERSON	PERSON MED AUTORITET	BEVOEGDE PERSOON
BEAM	FAISCEAUX	GITTER	RAGGI	HACES	STRALAR	STRALE	STRALEN
BLACK	NOIR	SCHARTZ	NERO	NEGRO	SVART	SORT	ZWART
BLOCK	BLOQUER	UNTERBRECHEN	BLOCCATO	BLOQUE	BLOCKERA	BLOK	ONDERBROKEN
BLUE	BLEU	BLAU	BLU	AZUL	BLA	BLA	BLAUW
BROWN	MARRON	BRAUN	MARRONE	MARRON	BRUN	BRUN	BRUIN
CABLE	CABLE	KABEL	CAVO	CABLE	KABEL	KABEL	KABEL
CLEAR	SECURITE	FREI	LIBERO	CLARO	KLAR	KLAR	VRIJ/VEILIG
CLOSE	FERME	SCHLIESSEN	CHIUSO	CERCA	NARA	LUKKE	SLUITEN
CONTROL	CONTROLE	AUSWERTEGRAET	CONTROLLO	CONTROLAR	KONTROLL	KONTROL	BESTURING
DANGER	DANGER	GEFAHR	PERICOLO	PELIGRO	FARA	FARE	GEVAAR
DETECTION CAPABILITY	CAPACITE DE DETECTION	AUFLOESUNG	RISOLUZIONE	CAPACIDAD DE DETECTION	UPPLOSNING	OPLOSNING	DETECTIEVERMOGEN
DISPOSAL	DISPOSITION	ENTFERNEN	SMALTIMENTO	DISPOSICION	SLANGAS	RADIGHED	VERWIJDEREN
ENABLE	ACTIVATION	MUTE BEDINGUNG	ABILITAZIONE		MOJLIGGOR	MULIG	ACTIVEREN
E-STOP	ARRET D'URGENCE	NOTSTOP	ARRESTO D'EMERGENZA	PARO DE EMERGENCIA	NODSTOPP	E-STOP	NOODSTOP
FAULT	DEFAUT	FEHLER	GUASTO	INCIDENTE	FEL	FEJL	FOUT
FEATURE	DISPOSITIF	EIGENSCHAFT	CARATTERISTICA	CARACTERISTICA	EGENSKAPER	MULIGHEDER	EIGENSCHAP
GREEN	VERT	GRUN	VERDE	VERDE	GRON	GRON	GROEN
GREY	GRIS	GRAU	GRIGIO	GRIS	GRA	GRA	GRIJS
INDICATOR	INDICATEUR	ANZEIGE	INDICATORE	INDICADOR	INDIKERING	INDIKATION	INDICATOR
INPUT	ENTREE	EINGANG	INGRESSO	ENTRADA	INGANG	INDGANG	INGANG
INSTALLATION	INSTALLATION	INSTALLATION	INSTALLAZIONE	INSTALACION	INSTALLATION	INSTALLATION	INSTALLATIE
LIGHT CURTAIN	BARRIERE	LICHTGITTER	BARRIERA OTTICA	CORTINA DE SECURIDAD	LJUS BARRIER	LYSGITTER	LICHTSCHERM
MAINTENANCE	ENTRETIEN	WARTUNG	MANUTENZIONE	MANTENIMIENTO	UNDERHALL	VEDLIGEHOIDE	ONDERHOUD
MODE	MODE	BETRIEBSART	MODO	MODO	FUNKTIONSLAGE	MODE	MODUS
MODEL	MODELE	TYP	MODELLO	MODELO	MODELL	MODEL	MODEL
MODULE	MODULE	MODUL	MODULO	MODULO	MODUL	MODUL	MODULE
MONTHS	MOIS	MONATE	MESI	MESES	MANADER	MANED	MAANDEN
MUTE	OPPRESSION	MUTE	INIBIZIONE	MUTE	FORBIKOPPLING	MUTE	ONDERDRUKKEN
OFF	OFF	AUS	NON ATTIVO		FRAN	SLUKKE	UIT
ON	ON	EIN	ATTIVO		TILL	TAENDE	AAN
OPEN	OUVERT	OFFEN	APERTO	ABIERTO	OPPEN	ABEN	OPEN
OPERATION	OPERATION	IN BETRIEB	FUNZIONAMENTO	OPERACION	DRIFT	OPERATION	INBEDRIJF
ORANGE	ORANGE	ORANGE	ARANCIO	NARANJA	ORANGE	ORANGE	ORANJE
OVERRIDE	ENFONCER	UEBERBRUECKEN	INVALIDARE	OVERRIDE	OVERSTYRNING	OVERSTYRE	OVERBRUGGING
OUTPUT	SORTIE	AUSGANG	USCITA	SALIDA	UTGANG	UDGANG	UITGANG
PINK	ROSE	ROSA	ROSA	ROSA	ROSA	LYSEROD	ROOS
RECEIVER	RECEPTEUR	EMPFANGER	RICEVITORE	RECEPTOR	MOTTAGARE	MODTAGER	ONTVANGER
RATING	ESTIMATION	KLASSE	CLASSIFICAZIONE	GRADO	KLASSIFICERING	KLASSIFICERING	STANDAARD
RELAY	RELAIS	RELAIS	RELE'	RELE	RELA	RELAE	RELAIS
RED	ROUGE	ROT	ROSSO	ROJO	ROD	ROD	ROOD
REPAIR	REPARATION	REPARUTUR	RIPARAZIONE	REPARAR	REPARATION	REPARERE	HERSTELLEN
RESTART	REDEMARRAGE	WIEDERANLAUFSPERRE	RIAVVIO	REINICIALIZER	ATERSTART	GENSTART	HERSTART
SAFETY	SECURITE	SICHERHEIT	SICUREZZA	SEGURIDAD	SAKERHET	AKKERHED	VELLIGHEID
SHIELD	TERRE	ERDFABEN	SCHERMO	MALLA	SKARM	SKAERM	AARDING
STATUS	STATUT	STATUS	STATO	ESTADO	STATUS	STATUS	STATUS
SUPPLIER	FOURNISSEUR	LIEFERANT	FORNITURE	PROVEEDOR	LEVERANTOR	LEVERANDOR	LEVERANCIER
TEST	ESSAI	PRUEFUNG	PROVA	TEST	PROV	TEST	TEST
TRANSMITTER	EMETTEUR	SENDER	EMETTITORE	TRANSMISOR	SANDARE	SENDER	ZENDER
VIOLET	VIOLET	VIOLETT	VIOLA	VIOLETA	VIOLETT	VIOLET	VIOLET
YELLOW	JAUNE	GELB	GIALLO	AMARILLO	GUL	GUL	GEEL
WHITE	BLANC	WEISS	BIANCO	BLANCO	VIT	HVID	WIT
MONITORING	SURVEILLENT	UBERWACHUNG	SORVEGLIANZA	EL VIGILAR	OVERVAKANDE	CHECK	BEWAAKT
CROSS-BEAM	RAYONS DIAGONALE	KREUZ STRAHL	RAGGI INCROCIATI	CHECK	KRYSS-STRALAR	KRYDS STRALE	DIAGONALE - STRALEN

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Mirrors

Reflector mirrors can be provided enabling two or three sides of a machine to be safeguarded with, what is effectively a single light curtain.

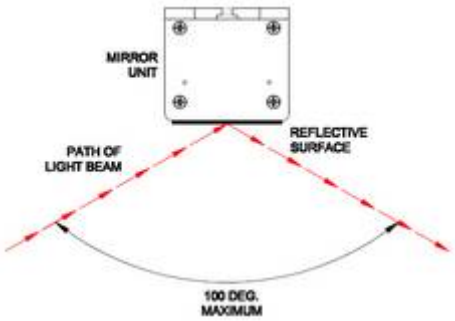
When mirrors are employed it is essential that the mounting of the transmitter unit, receiver unit and mirrors themselves are sufficiently rigid. Alignment becomes increasingly critical as the range and number of mirrors increase. Mirrors cause a reduction in optical efficiency, reducing the effective range. A guide to the practicality of using mirrors is given below.

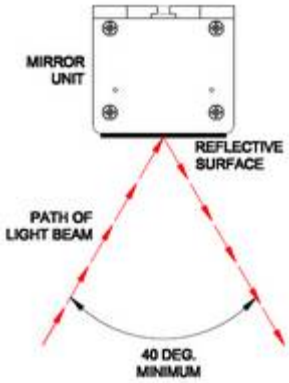
Range of the light curtain	Maximum range through 1 mirror	Maximum range through 2 mirrors
4m - 40m	30m	20m

Total Light Path	1 Mirror	2 Mirror
10m	Easy	Medium
15m	Easy	Not Feasible
20m	Hard	Not Feasible
30m	Not Feasible	Not Feasible

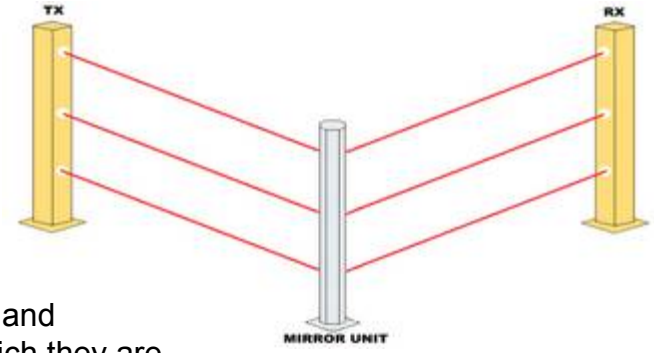
Based upon a 5K8-502APED

Note: The angle of the light curtain striking the reflective surface must be within defined limits.





Alignment through one mirror



1. Secure the transmitter, receiver and mirror units in the position in which they are intended to be used.

2. Ensure all units are perfectly upright in all planes by using a sprit level.

3. If the units are floor mounted on stands ensure the floor is even. Shim the floor mounts if necessary to ensure the units are all upright.

4. With one eye looking over the top of the receiver unit in line with the centre of the extrusion look towards the reflective surface of the mirror, in a similar manner to looking through a gun sight.

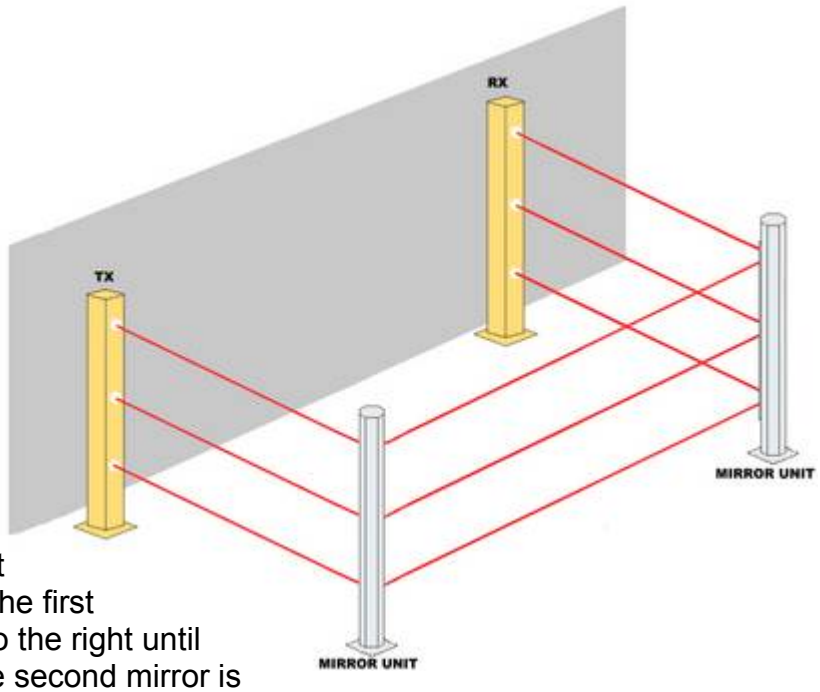
5. A second person must adjust the mirror to the left and right until the Perspex window of the transmitter unit can be seen reflected in the mirror.

6. If the light curtain is scanning over a long range it may be difficult to see the reflection of the transmitter units Perspex window in the mirror. If so, cut a piece of white paper to the size of the Perspex window and mount directly in front of the window. Now repeat step 5.

7. If the reflection of the white paper is difficult to see in the mirror then employ a third person to hold a flashlight in front of the transmitter unit with the light beam pointing directly in line with the Perspex window towards the mirror. Now repeat step 5.

8. Use shims to ensure the mirror is accurately aligned, to enable the infra red beams in the light curtain to reach the receiver. Alternatively, fabricate mirror mountings to include some form of adjustment to enable movement both left and right and also forward end backwards from the central axis of the mirror.

Alignment though two mirrors



9. Follow instruction 1-4

10. A second person must adjust the position of the first mirror to the left and to the right until the entire length of the second mirror is reflected in the first mirror. If difficulties are experienced in seeing the reflection on the second mirror in the first mirror then use a piece of white paper cut to size and position in front of the second mirror.

11. If the reflection of the white paper is difficult to see in the first mirror then employ a third person to hold a flashlight in front of the second mirror with the light beam pointing directly in line with its mirror housing towards the first mirror. Secure the first mirror.

12. Again follow instructions 1 to 4.

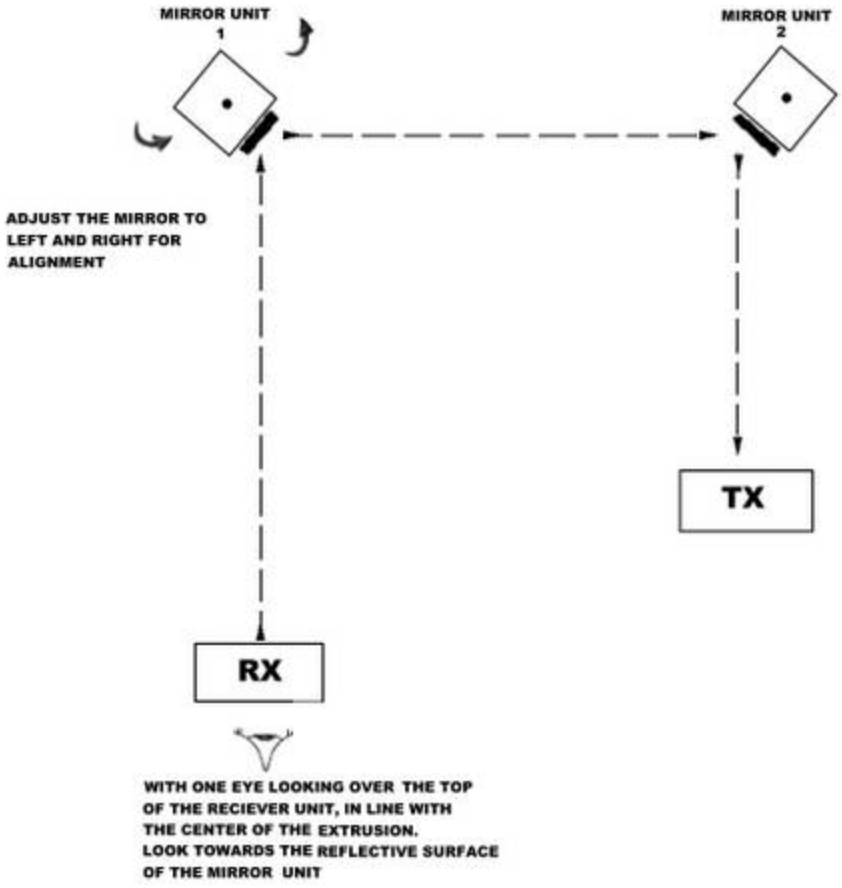
13. The second person must adjust the position of the second mirror to the left and to the right until the entire length of the transmitter unit is reflected through both the first mirror and the second mirror. If difficulties are experienced in seeing the reflection of the transmitter unit through both the first then the second mirrors then use a piece of white paper cut to size and position in front of the transmitter unit.

14. If the reflection of the white paper is still difficult to see through the first and second mirrors then employ a third person to hold a flashlight in front of the transmitter unit with the light beam pointing directly towards the second mirror. Secure the second mirror.

15. Ensure the mirrors are directly aligned thus enabling the infra red beams of the transmitter to reach the receiver. Alternatively, fabricate mirror mountings to include some form of adjustment to enable movement both left and right and also forwards and backwards from the central axis of each mirror.

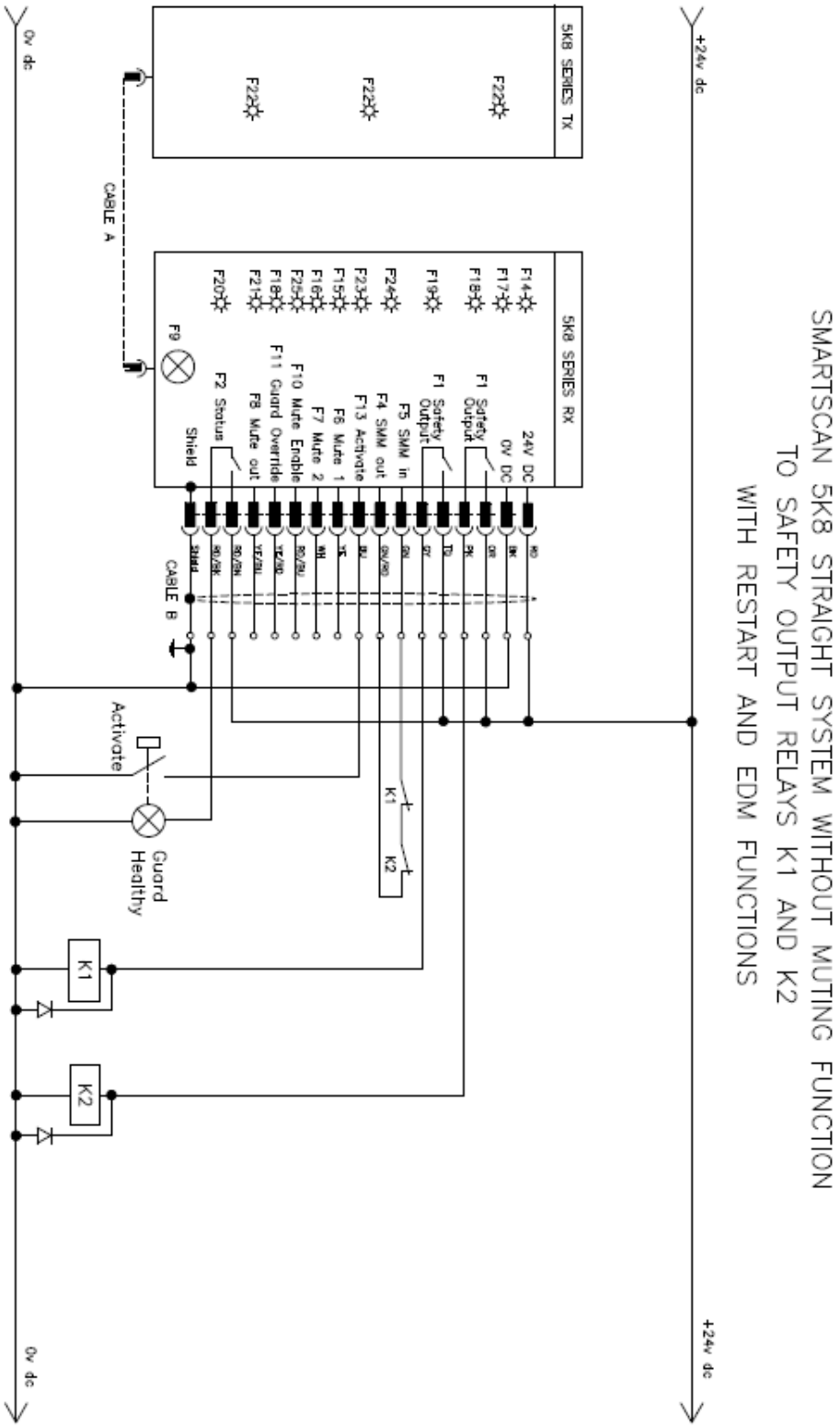
16. Now turn on the power to the light curtain and check that the green LED beam indicator, mounted on the receiver unit is ‘on’. If not, it may be necessary to finely adjust each mirror in turn to ensure the infra-red energy from the transmitter unit is being reflected through the mirror(s) to the corresponding receiver unit.

Alignment of the light curtain using mirrors

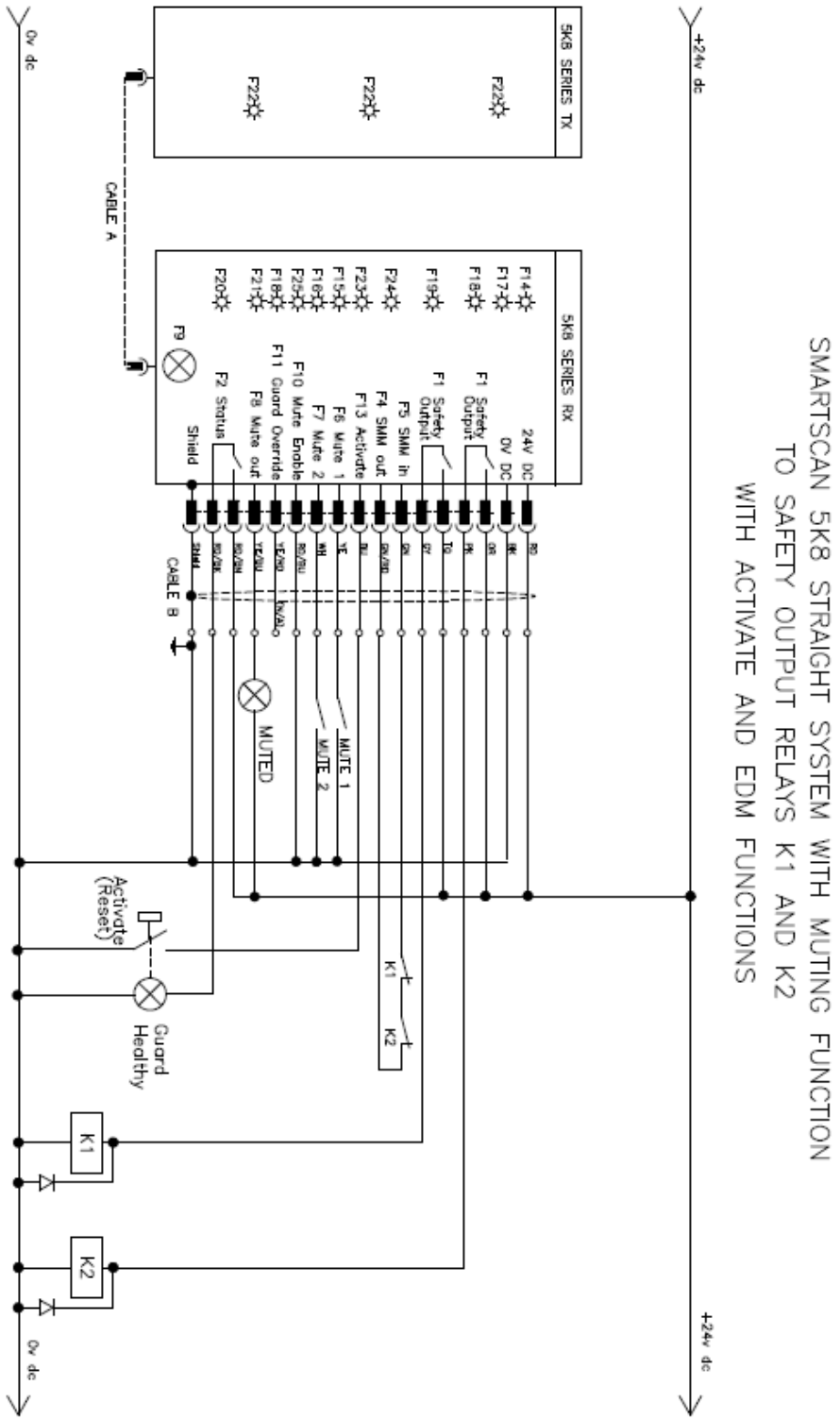


Note: The mirror length must be a minimum of 100mm longer than the overall length of the light curtain to be installed e.g. 50mm above and 50mm below either end of the light curtain

Example 1 - Smartscan 5K8 system without muting function. Output to safety output relays K1 and K2



Example 2 - Smartscan 5K8 system using cross beam muting. Output to safety output relays K1 and K2



Example 3 - Smartscan 5K8 system using cross-beam muting. Output to dual channel E-Stop