



# DualCom GradeShift UDL

## QUICK GUIDE & INSTRUCTION MANUAL

CONNECTED • SECURE • LIVE



# CSL

CONNECTED • SECURE • LIVE

POWERED BY

DualCom

TECHNOLOGY

The most trusted brand in Alarm Signalling

Figure 1 - GradeShift UDL

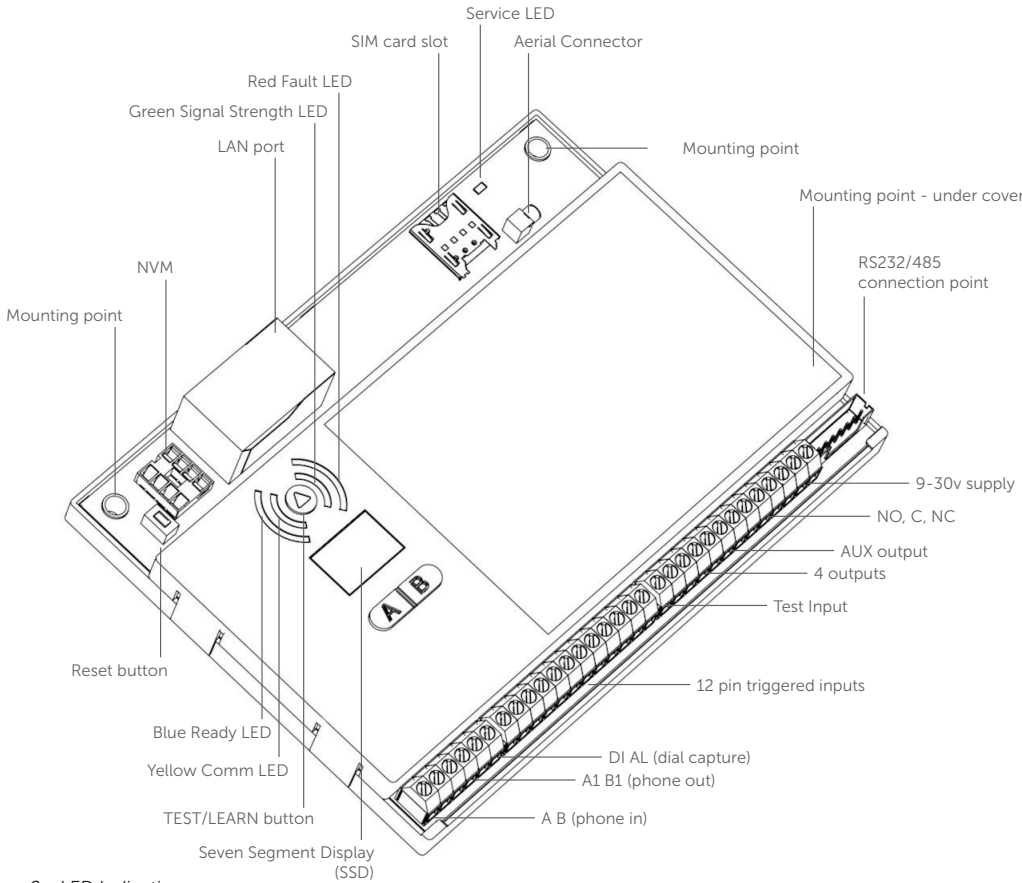


Figure 2 - LED Indications

LED Label	Description	LED STATUS			
		ON	Flashing	OFF	Other
Green	GPRS Signal Strength	Strong Signal Strength	Acceptable Signal Strength	Low Signal Strength, not acceptable	LED off and Red Fault LED on indicates no signal
Yellow	Communications	Input is triggered or Dial Capture is in progress	Sending a message to Gemini and ARC	No communication is in progress	Rapidly flashes to show successful communication
Red	Fault	Fault present see troubleshooting section	NVM contains factory defaults	No faults exist	On for 2 seconds indicates communication failure
Blue	Ready	Unit is ready to send messages to Gemini and ARC	N/A	Unit is busy and not ready to send new messages	LED off and Red Fault LED on indicates programming file is yet to be downloaded (usually takes 5-8 mins from power up with good signal)
Service (SVC) (next to aerial socket)	Network Status	N/A	SIM card registered on network	There is insufficient power or no power connected to the DualCom	Rapid flashing indicates unit is not registered to network

# QUICK GUIDE

## STEP 1. SITE SURVEY

Use a Signal Analyser (available from the CSL shop) to determine if sufficient base stations are available at the site and that they can supply sufficient signal strength. This will determine the optimum location for the DualCom's aerial to be mounted.

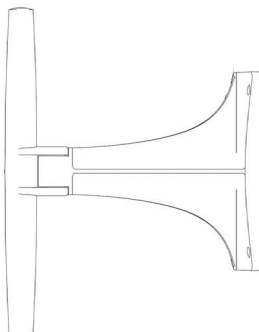
### SITING THE AERIAL

DO...

INSTALL VERTICALLY IN AN OPEN SPACE.  
COMPLETE A SIGNAL TEST BEFORE INSTALLING IN THE FINAL POSITION.

DON'T...

INSTALL CLOSE TO METAL OR SOURCES OF INTERFERENCE, I.E. WIRING, LIGHTING, ELECTRICAL INSTALLATIONS, COMPUTERS, MONITORS, ROUTERS & OTHER EQUIPMENT.



## STEP 2. INSTALLATION

- a. Ensure the aerial is mounted and connected in the correct position to achieve maximum signal strength. Apply power and wait for 5-8 minutes for the unit to connect to the network and download its programming file. Once completed the Green Signal Strength LED should be on or flashing, indicating an acceptable signal, the Red Fault LED should be off and the Blue Ready LED will be on. A percentage will also be shown on the SSD (Seven Segment Display) which should be 40% or higher. Now the GradeShift can be located into a suitable enclosure for the grade of installation.
- b. Wire the input triggers, attach the RS232/485 cable or connect the Control Panel's Digi-Modem PSTN terminals to the GradeShift's Dial Capture terminals (refer to wiring diagrams in Section 2 of this document). For a dual path device remember to connect for PSTN or LAN.
- c. Connect the fault output terminals to the Control Panel as required (refer to wiring diagrams in Section 2 of this document).
- d. Power down the the Power Supply Unit (PSU), connect 9-30volts DC supply to the GradeShift's power terminals and repower the PSU. Note that any voltage below 12v will indicate a low battery warning.
- e. For installations using Dial Capture no GradeShift configuration is required. Simply check that your Digi-Modem has an ARC telephone number (ie 01) and an account number (ie 1234), select your signalling format, connect the GradeShift and test.
- f. For pin triggering installations, ensure that the panel is in its normal state then press and hold the Test/Learn button for 3 seconds until the Green Signal Strength LED and the Yellow Communications LED flash alternately. Please note it is recommended that this step is not carried out until the instructions above has been completed.

IF USING A SEPARATE PSU TO POWER THE GRADESHIFT, MAKE SURE THE 0V IS COMMON BETWEEN THE PSU AND THE CONTROL PANEL.

### STEP 3. TEST & SELF LEARN USING THE BUTTON

To send test signals, tap the Test/Learn button (less than 1 second). The 7 SSD should change to c1, c2, c3, A. (A = the Gemini Platform acknowledges the alarm signal). Simultaneously, the Yellow Communications LED indicates comms progress. If available, GradeShift will test the secondary (wired) path using C1, C2, C3, A to indicate successful communication.

If the test is not successful the Red Fault LED will light for 2-3 seconds at the end of the sequence. The GradeShift will make multiple call attempts if unsuccessful.

To self-learn the inputs, push the Test/Learn button for 3-5 seconds. 'Pi' will be displayed during the self-learn process.

### STEP 4. CHECK SIGNALS HAVE BEEN RECEIVED AT YOUR ARC

Once you have successfully tested your GradeShift, make sure that you check with your ARC to see that they are receiving signals. This can be achieved by calling your ARC or using their web based secure platform.

IF YOU HAVE PURCHASED A DUAL PATH DEVICE YOU MUST ENSURE BOTH PATHS ARE CONNECTED BEFORE LEAVING SITE.

# INSTRUCTION MANUAL

## 1. ADVANCED INSTRUCTIONS

### 1.1 LINE FAULT

Ensure you wire the fault output in accordance with the standard you wish to adhere to. For further information on the different options please follow the wiring diagrams in Section 2 and the full Installation Manual available via the Installer Zone on the CSL website: [www.csldual.com/installer-zone](http://www.csldual.com/installer-zone)

### 1.2 ENABLE/DISABLE PSTN/LAN

To enable/disable PSTN use the following A & B button sequence:



P



Pi



Pn



Pn (n is flashing). This disables PSTN



Pn (n is on solid). This enables PSTN

To enable/disable LAN:



P



Pi



PL



PL (L is on solid). This enables LAN



PL (L is flashing). This disables LAN

INCREASE PSTN/RADIO FAIL (for 10 mins – engineer mode):



t



Eng

tE

### 1.3 FAIL TO COMMUNICATE MONITORING USING DIAL CAPTURE

If you want to monitor the Dial Capture connection, connect an output configured as PSTN line fault on your Control Panel to one of the GradeShift's inputs. Designate that input as Dial Capture fail at your ARC. For wiring instructions see Section 2.

RS232/485: for installations using RS232 or RS485 simply follow the wiring diagrams in Section 2.

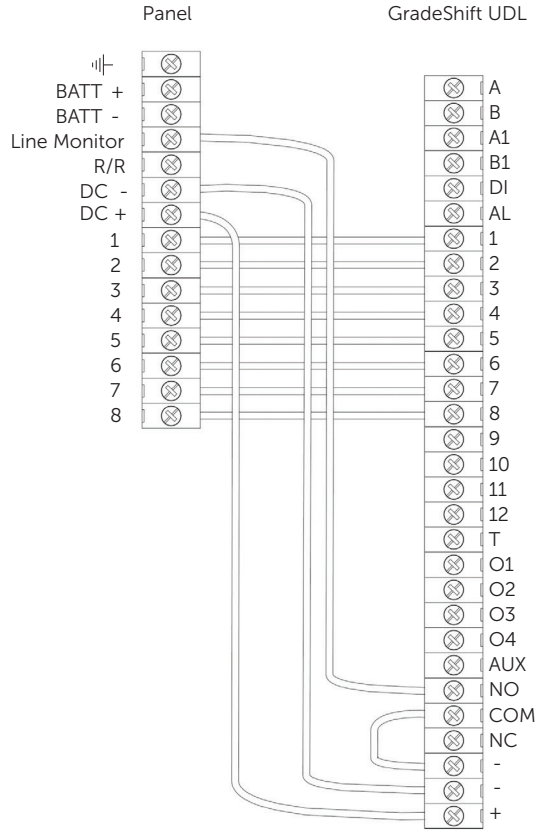
LAN: For installations using LAN as a communication path connect a Cat5 (or higher).

GRADESHIFT WILL AUTOMATICALLY LEARN WHETHER THE PSTN LINE REQUIRES A 9 TO DIAL OUT AND WILL SAVE THE SEQUENCE TO ITS CONFIGURATION. IF THE PSTN CHANGES AND NO LONGER REQUIRES A 9 TO DIAL OUT GRADESHIFT WILL REVERT THE CHANGES.

## 2. WIRING DIAGRAMS

### 2.1 PIN TRIGGERING

In the operation, GradeShift is triggered by applying or removing zero volts to the input terminals 1-12. No external pull-up resistors will be required. This is generally achieved via the digital communicator outputs of an intruder alarm or similar Control Panel. GradeShift will signal alarm conditions and will generate the relevant messages and forward them via Gemini to the ARC. Installers are advised that the intended use should avoid situations where the rate of triggering exceeds the rate at which messages may be sent to, or received by, the ARC receiver.

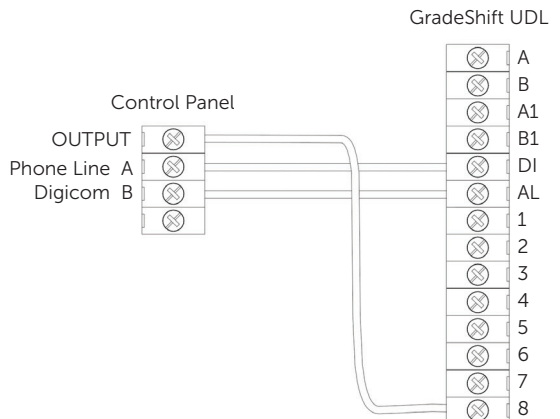


### 2.2 DIAL CAPTURE

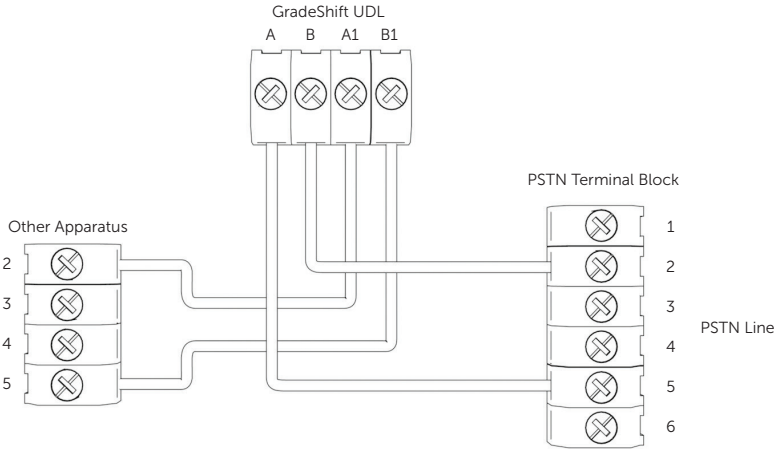
In this operation, GradeShift simulates and replaces the phone line connection to the Control Panel's Digi-Modem.

The Control Panel's Digi-Modem must use one of the following alarm formats: Fast Format, Contact ID or SIA. In the event the Control Panel needs to send a signal to the ARC, GradeShift will capture the message and forward it, via Gemini, to the ARC. The Digi-Modem must have an ARC telephone number (ie 01) and account number (ie 1234) programmed for Dial Capture to work.

If you want to monitor the Dial Capture connection, you will need to connect an output configured as PSTN line fault on your Control Panel to one of the GradeShift's inputs. That input then needs to be designated as Dial Capture Fail at your ARC.

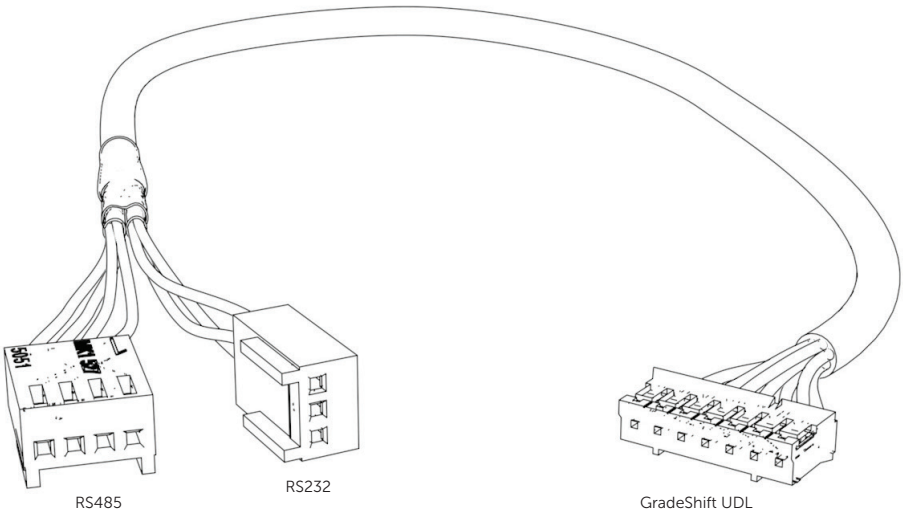


### 2.3 PSTN



### 2.4 RS232/485

For further instructions on Control Panel programming please review the how to guides on the Installer Zone of our website: [www.csldual.com/installer-zone](http://www.csldual.com/installer-zone)





### 3. TROUBLE SHOOTING

**Q. The Red Fault LED is continuously flashing, what does this mean?**

A. This happens when the unit is first powered and needs to download its configuration file from the Gemini Platform which can take 5-8 minutes. You must ensure that the Yellow Service (SVC) LED is flashing every 3-5 seconds, which indicates that the unit is connected to the mobile network.

**Q. The GradeShift repeats the 'power-up' sequence but never completes it.**

A. The power supply has a low output voltage or is unable to supply the current required by the GradeShift when it is activated. Check the power supply with a multimeter. Also, test the GradeShift's operation when powered by a 'known good' 12 volt battery.

**Q. The Red Fault LED is on, what is the problem?**

A. Please refer to the error code on the SSD and the error code list at the end of this document.

**Q. Triggering via 'Dial Capture' does not seem to work.**

A. During communication between the Control Panel and the GradeShift, the display should show 'DC'. If 'DC' is displayed, but c1, c2, c3, A is not, the panel may not be compatible or is configured to send a protocol that GradeShift does not recognise. If available, check the Control Panel's programming and select an alternate signalling format. Please check our online compatibility table for the latest list of compatible Control Panels and formats: [www.csldual.com](http://www.csldual.com).

**Q. The ARC is not receiving messages.**

A. In most cases the GradeShift will explain the reason a signal cannot be sent to your ARC using an error code shown on the SSD. If, after trying to rectify the displayed fault, the GradeShift can still not transmit to your ARC please contact CSL Technical Support.

## 4. ERROR CODES

In the event of an issue the GradeShift will display an error code on the SSD. This is the letter 'E' followed by a number. A list of error codes is shown below (page 9 and 10) along with the potential solution.

During operation, an Error Code may be displayed for up to 4 minutes. During this time, if the fault is corrected, or another error of higher priority occurs then the display will indicate the new value.

Error Code (E+)	Description	What you should do
0	No Errors	
'Lo'	Low supply voltage	Check supply voltage
1	NVM missing or not fitted correctly	Check NVM fitted correctly
2	NVM data error. Not programmed correctly	Check NVM programming. Call CSL Technical Support
3	NVM checksum fault	Check NVM programming. Call CSL Technical Support
4	Power Fault. Voltage low etc.	Check supply voltage is in the 10 - 30 volt range at all times
5	485 Bus Port enabled but comms have failed	Check the 485 Bus Port connections to the Control Panel or the Plug-on Adapter
10	Radio. No base stations detected	Check aerial connection and base station signals
11	Radio. Not registered on any GPRS network	Check SIM card and base station signals. Call CSL Technical Support
12	Radio. No response from radio module	Check module is fitted correctly. Check power. Call CSL Technical Support
13	SIM card missing or not fitted correctly	Check SIM card is fitted correctly
14	SIM card locked/disabled. No radio path operation possible	PUK Code required to unlock SIM. Call CSL Technical Support
15	SIM card PIN number is wrong	Check SIM PIN number in NVM. Call CSL Technical Support

Error Code	Description	What you should do
17	Radio module faulty	Power down. Wait 1 minute. Re-power & re-check. Call CSL Technical Support
18	Radio. Interference or jamming signals detected	Check local radio environment. Use a CSL Signal Analyser
21	PSTN line DC voltage = low or none	Check PSTN connections to A&B terminals
22	PSTN. A phone, fax, etc. on the same line is off hook	Check for another phone, fax, etc. on the same line as DualCom or disable detection in the NVM
23	PSTN. Incoming ringing detected	Disable incoming ringing with Telephone supplier or disable detection in the NVM
24	PSTN dialling attempt. No dial tone	Check PSTN connections and that the service is available
25	PSTN. All call attempts have failed	Check PSTN connections and that the service is available
26	PSTN. Three successive call attempts have failed	Check PSTN connections and that the service is available
31	Radio. GPRS fault	Check SIM card fitted correctly. Check GPRS service
32	Radio. GRPS communications failure	Check SIM card fitted correctly. Check GPRS service. Check NVM programming
41	LAN Ethernet Cable (e.g. Cat5) not connected	Check Ethernet Cable is connected to LAN (IP) card. Check LAN cable is correctly connected to LAN Router/Hub/Switch at other end
43	No response from the Default gateway. (the Router to the Internet)	Check LAN wiring, Router, power supplies and DualCom's IP programming. Call CSL Technical Support
44	LAN communications failed	Check DualCom's IP programming. Check Router is not firewalled. Call CSL Technical Support
45	No response from WAN ping address	Check DualCom's IP programming. Check Router is not firewalled. Check Gemini Secondary Polling Server. Call CSL Technical Support
47	Invalid Router, Gateway or WAN address	Check DualCom's IP programming
51	Radio path. All call attempts have failed.	Check all Radio settings in the NVM. Call CSL Technical Support
99	NVM data error. Not programmed correctly	Check NVM programming. Call CSL Technical Support

#### Critical Errors:

To alert the User and Installer to critical error conditions, after the normal sounder beeps have timed out the GradeShift unit will continue to beep once every 5 minutes.

## 5. SUPPORT

For assistance please telephone or email our CSL Technical Support. Before doing so please review the Installation Manual and How To Guides on the Installer Zone of our website: [www.csldual.com/installer-zone](http://www.csldual.com/installer-zone)

UK Tel: +44 (0)1895 474 444  
Ireland Tel: 1800 855 695  
Netherlands Tel: 010 - 714 54 93  
Email: support@csldual.com  
Hours: 08.30 to 18.00 weekdays, 10.00 to 16.00 Saturday (all times GMT)

## 6. OPTIONAL EXTRAS

All the products below are available to order via your ARC or the CSL Installer Shop.

Part number	Product variant
CS2056	Aerial Extension Lead 5m
CS2057	High Performance Aerial External/Internal (includes 5m lead)
CS2367	2G/3G Signal Analyser - Measures and displays radio signal strength and any interference
CS1520	Grade 2 Boxed Power Supply 0.5 amp c/w fixings for DualCom
CS1530	Grade 3 Boxed Power Supply 0.5 amp c/w fixings for DualCom
CS0720	ADSL Broadband Filter with screw terminal connections (box 8)



# CSL

CONNECTED • SECURE • LIVE

POWERED BY

DualCom

TECHNOLOGY

The most trusted brand in Alarm Signalling

# SPECIFICATIONS

Dimensions	21 mm (h), 132mm (w), 94mm (d)													
Weight	140g including NVM and SIM													
Temperature	-20C to +60C transit, -10C to +50C operating													
Humidity	0 - 80% non-condensing													
Mounting	Any orientation													
Warranty	5 years													
Power Requirement	9.0v - 30.0v ---													
Maximum Current Consumption	Quiescent = 20 mA, signalling = 200mA Max													
LED Indications	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">LED</th> <th style="width: 50%;">Function</th> </tr> </thead> <tbody> <tr> <td>Green</td> <td>Signal Strength</td> </tr> <tr> <td>Yellow</td> <td>Communication Status</td> </tr> <tr> <td>Red</td> <td>Fault</td> </tr> <tr> <td>Blue</td> <td>Ready to Communicate</td> </tr> <tr> <td>Service (SVC)</td> <td>Network Status</td> </tr> </tbody> </table>		LED	Function	Green	Signal Strength	Yellow	Communication Status	Red	Fault	Blue	Ready to Communicate	Service (SVC)	Network Status
LED	Function													
Green	Signal Strength													
Yellow	Communication Status													
Red	Fault													
Blue	Ready to Communicate													
Service (SVC)	Network Status													
Radio Path	2G GSM and 3G GPRS services													
Aerial	50 ohm (nominal) on MMCX socket													
Operation Method	Store and Forward (SIA) Pass Through (Fast Format/CID)													
CIE Interconnections	Input 'pin triggering' (Parallel) 12 channels, Analogue (Dial Capture), RS232 Serial, RS485 Bus													
RCT Protocols	Fast Format/Contact ID/SIA													
Input Terminals	Max +30v, Min 0 Vdc (reference supply 0v terminal) 100k pull-up resistor to +5v													
Low Battery	9.8v falling, 12.0v recovery													
Fault Output	Changeover contacts (60v max, 100mA max)													
Aux Output	Normally Open contact, may be inverted (60v max, 100mA max)													
General Purpose outputs	Four. Each switched to 0v (30v max, 100mA)													
User Serviceable Parts	There are no user serviceable parts within the GradeShift													
Standards	Suitable for use in alarm systems complying to: EN50136-1:1998 Security Grade 4/DP3 EN50136-2:2012 SP3 (RADIO) SSF 114 v2 Larmklass 2 EN50131-10 Type Y ATS Classification: EN50136 ATSS/SP3 ATS 5 parameters: D3/M3/T4/S2/I3/A3													
Environmental	EN50136/EN50131 Environmental class II Device should not come into contact with water													
Emissions	EN55022													
Installation	The CS5301-01 shall be installed by a service person and be powered by a Limited Power Source in accordance with clause 2.5 of EN 60950-1 or equivalent, not exceeding the maximum voltage of 30 Vdc, capable of delivering a minimum current of 200mA and be current limited (fused) to 1A. It shall be installed inside an enclosure of another I&HAS component which shall be that of a CIE conforming to EN 50131-3, or a PSU conforming to EN 50131-6.													