



Installation Manual

for the Duet Range:

D2600 Duet2
D2650 Duet3

Dycon Ltd

Cwm Cynon Business Park – Mountain Ash – CF45 4ER – UK

Tel: +44 (0)1443 471 060

Fax: +44 (0)1443 479 374

www.dyconsecurity.eu

sales.en@dyconsecurity.eu

TABLE OF CONTENTS

1.	Description	p.3
2.	Part Numbers	p.4
	What to Do:	
3.	Site Survey	p.5
4.	Installation	p.6
5.	System Testing	p.6
6.	Troubleshooting / Help Desk	p.7
	The Details:	
7.	Operation Description	p.8
8.	FLT Output Relay	p.12
9.	SMS Output Control	p.12
10.	Ringling on PSTN	p.12
11.	Ringling on GSM	p.12
12.	NVM Programmable Options	p.13
13.	Engineer Receiver Function	p.13
14.	Aerial Siting	p.13
15.	SIM Card	p.14
16.	Duet Mounting	p.14
17.	Security	p.14
18.	SMS Messages	p.15
19.	Using the D2355 Wired LAN Card	p.17
20.	System Power Supply and Battery	p.18
21.	NVM Programming	p.18
	Appendix 1 (LED Indications)	p.20
	Appendix 2 (SMS Commands Table)	p.23
	Appendix 3 (ADSL)	p.26
	Appendix 4 (Specification & Regulations)	p.28
	Appendix 5 (European PSTN Approval)	p.29
	Appendix 6 (Glossary of Terms)	p.30

Installation Manual for D2600 Duet2 and D2650 Duet3

1. Description

The Duet is an advanced auto-dialling digital communication device for adding GPRS, GSM, SMS and LAN reporting to control panels that have a telephone line connection.

The Duet monitors the telephone line that is normally connected to the control panel's digi-modem. If a line fault is detected, the Duet sends a line fault alarm to the Alarm Receiving Centre on its radio path. Any subsequent alarm transmission from the control panel is then sent to the ARC via the radio path. In addition, alarms can also be sent by SMS text to mobile phones.

The Duet can be used as the primary or secondary path for alarm transmission but will be the main path for test calls.

The Duet has 4 trigger inputs that can be activated independently.

The Duet continuously monitors the radio path. If a radio path fault is detected, the Duet allows the control panel to dial out on the PSTN network and sends a radio fault alarm to the ARC on the LAN path (if available).

The **Duet2 D2600** can operate with control panels using DTMF Fast Format and Contact ID alarm reporting protocols.

The **Duet3 D2650** can operate with control panels using DTMF Fast Format, Contact ID and SIA alarm reporting protocols.

The Duet will require a GSM SIM card that is enabled for 'GPRS, GSM data and SMS' operation.

The Duet is semi-housed in an ABS plastic case which protects the electronics and meets PSTN safety requirements.

The Duet includes 4 outputs that can be controlled from the associated downloader or by sending SMS messages to the unit from a PC or mobile phone.

Up/downloading telephone calls to the control panel are unaffected by the Duet.

2. Part Numbers

D2600-B	GPRS Duet2 (including aerial)
D2650	Duet3 (including aerial)
D1501-B	Tamper protected box with 1-amp power supply
D2454	Downloading software and NVM programmer
D2355	LAN card
D0730	Security ADSL (Broadband) filter
D0402	Products CD with manuals for all products
CS0355	NVM programming socket (USB)

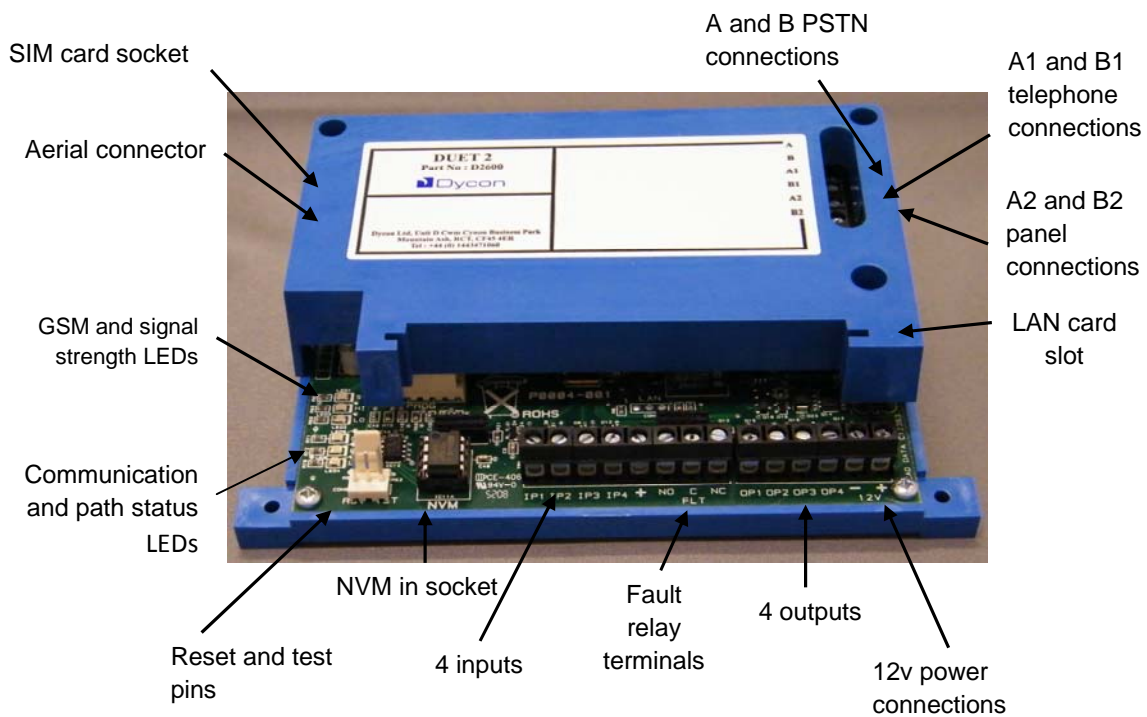


Fig 1 - D2600-B Duet2

3. Site Survey

It is strongly recommended that a site survey is conducted prior to the installation of a Duet to confirm that adequate GPRS signal strength is available at the site.

If there is no GPRS radio coverage at the proposed site, the Duet radio alarm reporting path will **not** operate.

You can use a Duet, aerial and fully charged battery to survey the proposed site for the point of strongest signal. See Aerial Siting on Page 13 for more information. Make a note of this point and use it when installing the Duet aerial.

The preferred method of determining whether the site has an acceptable signal is to use the Dycon D2366 Test Meter, which will show signal strength, Bit Error Rate and other relevant parameters.

You can also use a mobile GSM telephone to show GSM signal strength. **It MUST use the same GSM network as the Duet's SIM Card uses.** A portable GPRS telephone that uses a **different** network will **not** show the correct signal strength.

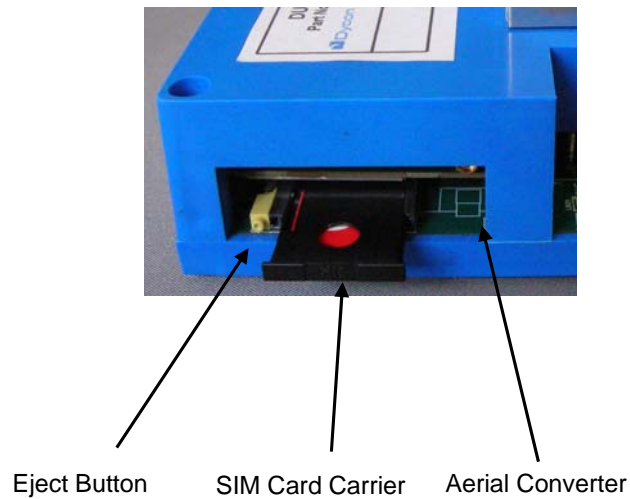


Fig 2

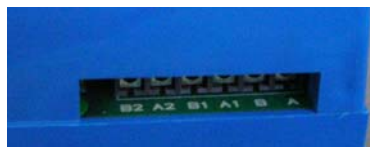


Fig 3 - PSTN Connections



Fig 4 - Using the D2355 Wired LAN Card

4. Installation

1. Site the aerial at the point of strongest signal ensuring that it is within the protected area. This is usually the highest point in the building and well away from metal roofs and metal walls (use Dycon D2366 Test Set). See Page 13.
2. Program the NVM for the system specific requirements using the D2454 Programmer software. See page 18.
3. Obtain a GPRS-enabled SIM card from your GSM Service Provider.
4. Totally power down the control panel mains and battery.
5. Fit the GPRS enabled SIM Card in the socket on the Duet.
6. Where required, fit the D2355 LAN card and connect to the LAN using a CAT5 cable.
7. Fit the NVM into the 8-pin socket located at the front of the Duet. See Fig 1.
8. Connect the 4 inputs and 4 outputs as required. See Fig 1 and Page 17.
9. Connect to the FLT relay terminals as required. See Page 12.
10. Connect the aerial to the Duet aerial connector. See Fig 1.
11. Connect the control panel's PSTN line to the A2, B2 terminals. See Fig 3.
12. Connect the user's PSTN telephone system to screw terminals A1 and B1 provided under the protective cover. (For security installations, only 'serial connection' is recommended for other equipment that is using the same PSTN line). See Pages 17 to 23.
13. Connect the PSTN line to the A, B screw terminals. See Fig 3.
14. On the Duet, connect the '12v +' & '12v -' terminals to the control panel or power supply's 12 volt output (often called 'Aux supply' or 'DC power'). See Fig 1.
15. Note the SIM Card number, NVM 'chip' number (and any security access numbers) on the site records that will be stored at your office.
16. Reconnect the mains supply to the control panel. The Duet is now ready for testing.

5. System Testing

Ensure you have informed your Alarm Receiving Centre that you are ready to test your Duet.

1. Power up the Duet, the unit will initialise. This will take 40 seconds. Refer to Appendix 1 for LED indications.
2. To test **all** programmed reporting paths to the ARC, momentarily short the test pins on the Duet (see Fig 1). This will cause the Duet to send a test signal to the ARC on each path used (LAN / GPRS / GSM / SMS).

Once the test pins are shorted, communication LEDs will illuminate to indicate call progress on each path (Green for LAN and Yellow for GPRS / GSM). During communication the LEDs will flash to indicate the progress of the call, see Appendix 1. The Alarm Receiving Centre should receive a test call for each path used.

System Testing (cont'd)

3. To confirm correct operation, trigger a call to the ARC by setting the control panel so that it sends a 'Close' signal. With the telephone line connected, the signal should go to the ARC via the telephone line.

Disconnect the telephone line. The Duet should detect this and send a "PSTN Fail" signal to the ARC via the GPRS radio path. Unset the control panel. The 'Open' should go to the ARC via the GPRS radio path.

4. Contact your ARC to confirm that all signals have been received.
5. If you are using SMS signalling, check that the relevant messages have been received on the GSM phone.
6. To cancel a call, short the reset pins, and the test pins. Remove the short from the reset pins; wait until the Hi / Lo LEDs start to flash, then remove the short across the test pins.
7. Remember to note the SIM Card number, NVM 'chip' number (and any security access numbers) on the site records that will be stored at your office.
8. Your Duet is now fully tested.

6. Troubleshooting

Q. What if the GPRS / GSM signal has not been received by the Alarm Receiving Centre?

Check that the NVM is fitted has been correctly programmed.

Check that the SIM Card fitted has been correctly programmed i.e. it is enabled for 'GPRS' and for 'Data'.

Check, using the Signal Strength LEDs (Red and Green) that the radio signal is sufficient and the GSM path status = OK.

Check with a meter that the voltage supply to the Duet is 13.6v or more, and does not dip when the Duet is signalling.

See Appendix 1 for GSM fault indications. These will help diagnose radio path problems.

Q. What if the LAN (IP) signal has not received by the Alarm Receiving Centre?

Check (using the LEDs) that no LAN path exists.

Check that the LAN has a route to the Internet. Ensure that firewalls, routers etc... will allow external access.

Check that the LAN has a DHCP Server function. The LAN card requires this when first connected to the LAN.

Check with a meter that the voltage supply to the Duet is 13.6v or more and does not dip when signalling.

See Appendix 1 for fault indications. These will help diagnose LAN path problems.

Help Desk

If you have installed the Duet in accordance with these instructions, checked all the above points but are still experiencing problems you can contact your Duet supplier or your Telecom Service Provider.

The Dycon web site: www.dyconsecurity.eu contains the latest copies of all manuals for all products. Please ensure that you are working from the latest version. You can also download associated information and software samplers. Sales, shipping and contact information is here too.

7. Operation

The basic operation of the Duet is to intercept communication activity from the alarm control panel or other digital communication device (Digicom) to the PSTN and redirect it to 1 or more locations using 1 or more signalling paths. The signalling paths can be **WIRED** (PSTN, LAN) or **RADIO** (GSM, GPRS, SMS).

The Duet performs the following functions:

1. Intercepts alarm communication from the alarm control panel; stores the data for later or immediate transmission and acknowledgement, according to programming;
2. Monitors the wired and radio paths for integrity. Signals any change of status;
3. Sends regular test transmissions;
4. Sends regular polling transmissions;
5. Allows SMS or downloader control of the 4 outputs;
6. Monitors the PSTN for incoming ringing and switches the alarm control panel to the PSTN for any downloader transmissions;
7. Monitors the GSM network for incoming calls, either to download to the Duet, or to receive SMS controls;
8. Monitors the alarm control panel calls via PSTN, and intercepts if required;
9. Operates according to NVM programmable features and options (see NVM programmer).

7.1 Call Interception

The Duet works in 1 of 2 modes: Duet Priority or PSTN Priority.

7.1.1 Duet Priority

The PSTN relay is energised, so that the control panel is connected to the Duet. All calls are intercepted by the Duet and re-transmitted via radio or LAN.

If the radio and LAN paths fail, or if a programmable number of call attempts fails, the PSTN relay is de-energised and the alarm control panel is connected directly to the PSTN, so that its normal calling function may proceed as if the Duet was not there.

In **DUET PRIORITY MODE**, the Duet intercepts alarm communication from the alarm control panel and, depending on programming, will either:

- Acknowledge the message and store the data for later transmission, or
- Store the data and immediately attempt to forward the call without sending an ACK to the control panel.

7.1.1.1 Store and Forward

In this case, the Duet accepts the call from the alarm control panel, stores it and sends an ACK message back to the alarm control panel. The Duet then calls the ARC and passes the message on.

The Duet works in this way automatically for 5 minutes (or whatever the "Acknowledge Timer" is set to in programming) after every successful call to the ARC.

Note: SIA format only works in this mode regardless of NVM programming.

Call Interception (cont'd)

7.1.1.2 Forward before Acknowledge

In this case, the Duet will attempt to forward the call before sending an “acknowledge” to the alarm control panel. This will cause the alarm control panel to make several attempts to call the Duet.

If the alarm control panel has many Contact ID messages to send, they will be forwarded very slowly, one call forwarded at a time, rather than using the “follow-on” call technique.

This operation may be improved by using a third technique. This will only forward the first call without acknowledging the alarm control panel. Further calls within a short period of time will use the “store and forward” technique. This is accomplished by programming the “Acknowledge Timer” in the programmer to 5 minutes for example. If this timer is set to 0, then forward before acknowledge will always operate.

7.1.2 PSTN Priority

The PSTN relay is not energised, so that the alarm control panel is connected directly to the PSTN. This is the default state when the Duet is not powered.

The Duet monitors the PSTN line and if it fails, switches the alarm control panel to the Duet.

The Duet also monitors outgoing calls of the alarm control panel over PSTN, and if a programmable number of call attempts fails, will switch the alarm control panel over to the Duet, for a programmable period of time.

For example, if two call attempts fail and the third is successful, subsequent calls will be attempted over the PSTN. However, if three call attempts in a row are unsuccessful, the Duet will switch the alarm control panel to the Duet and intercept the fourth call, and re-transmit it over radio or LAN. In this event, the Duet will keep hold of the alarm control panel for 10 minutes (or whatever time period is programmed) before reverting the control panel back to the PSTN.

If the radio path fails, the alarm control panel will remain connected to the PSTN even if a PSTN fault is detected.

Note: In this mode, if the call is made via PSTN, the SMS text function for alarm control panel calls will not work.

7.2 Duet Line Simulator

When the Duet is connected to the alarm control panel, the operation is as follows:

1. The Duet provides 42-45VDC to the alarm control panel simulating a telephone line
2. When the alarm control panel goes off hook to make a call, the Duet detects the increased current and provides dial tone to the alarm control panel (350Hz for maximum of 9 seconds)
3. The alarm control panel dials its programmed telephone number using DTMF (if DTMF is detected during the 9 seconds of dial tone, the dial tone is switched off). The telephone number dialled is ignored by the Duet. The Duet will wait 3 seconds for dialling to complete, then it will give handshake tones to the alarm control panel (the frequencies of these tones are programmable in the NVM).

Note: if the alarm control panel dials in Loop Disconnect, as long as it takes less than 9 + 3 seconds to complete, it will be ready to accept the HS tones from the Duet, after the 12 seconds have elapsed. The alarm control panel will send Fast Format or Contact ID data.

4. If the Duet receives no DTMF in response to the Fast Format handshake, it will repeat it. If it still gets no response, it will send out a SIA handshake tone, and wait for SIA FSK data.
5. The Duet will store the received data in its NVM and signal an “Acknowledge” tone (which is programmable) to the alarm control panel (if the “forward immediately” option is selected, the ACK is not sent at this time).
6. Once a data message has been transferred to the event log NVM, the Duet will commence its signalling function via GPRS, GSM, LAN and/or SMS, depending on programming. Once the signalling is complete, the Duet will mark that data message as being sent.
7. A preferred path may be selected, either wired or radio. If three calls to the preferred path fail, the Duet may call via other paths, and rotate between them until a successful call has been made. In the unlikely event of all calls being unsuccessful, the Duet will operate a “Fault” relay output. This output may be connected back to the HCP or to any other equipment. This output will remain active until a successful communication has occurred, or the Duet is reset.

7.3 Line Monitoring

The Duet will constantly monitor the programmed paths for integrity. Should the PSTN path fail, for example, the Duet will construct a 'PSTN Line Fail' message, using programmable details, and pass this data message into the NVM for processing. Similarly if any other path should fail a suitable message will be constructed and passed to the NVM.

Please refer to the Test Call and Line Monitoring NVM strings in 7.4.3 below.

Should both radio and wired paths fail, the Duet will operate the 'Fault' relay output and switch the PSTN relay over to the alarm control panel.

If only one calling path has been programmed, and it fails, the relay output will also operate. This output will remain active until a programmed path becomes available, or the Duet is reset.

7.4 Duet-Generated Calls

7.4.1 Test Calls

Test data messages may be set to occur at regular intervals. A single timer exists for this. If programmed to 0, no test calls will occur. The period may be programmed from 0 to 99. The units may be selected from Seconds, Minutes, Hours or Days.

Test calls may be programmed for any path.

7.4.2 Polling Calls

Polling calls may be set to occur at regular intervals. A single timer exists for this. If programmed to 0, no polling calls will occur. The period may be programmed from 0 to 99. The units may be selected from Seconds, Minutes, Hours or Days.

Polling calls may only be programmed on the GPRS and LAN paths.

Polling calls differ from alarm calls in several ways:

1. The APN (Access Point Name), IP address and port numbers are programmed independently of the alarm details.
2. Only one call attempt is made upon polling timer expiry.
3. The APN will only be changed if the previous polling call was unsuccessful.

Note: No polling calls will occur in SIA format. They will be in Fast Format 8 or 16 if the polling data is 1 or 2 characters respectively or in Contact ID format otherwise.

7.4.3 Test Call, Line Monitoring and NVM Input Data

Programming the Test Call, Line Monitoring and Input message strings in the NVM should be done as follows (*it is assumed that the reader is familiar with Fast Format, Contact ID or SIA. If not, please refer to the appropriate alarm format specification documents*).

Test Call, Line Monitoring and NVM Input Data (cont'd)

7.4.3.1 For **Fast Format** the string should contain the channel number. For 8-channel reporting, this should be a single digit. For 16-channel reporting, this should be 2 digits.

Examples:

Message	8 Channels	16 Channels
Test Call	9	17
PSTN Line Fail	6	16
GSM Line Fail	7	15
Input 1	1	01
Input 2	2	02
Input 3	3	03
Input 4	4	04

Notes (Fast Format):

1. If the channel number is 1-8 or 01-16, the data in that channel will be '1' for alarm, and '3' for restore.
2. If the channel number is 9 or 17, the data in that channel will be '9' indicating a test call. There is no 'Restore' message.
3. The 4, 5 or 6 digit account number will precede the 8 or 16 channel data string.
4. Any message generated by the Duet, as distinct from one intercepted from the alarm control panel, will have all channels not specifically being reported by the event, set to '5'. The ARC personnel / computer must interpret this data correctly so as not to infer anything from the channels set to '5'.

7.4.3.2 For **Contact ID Format** the string should contain the 3 digit identifier, plus any partition, zone or user information, up to a maximum of 8 characters. The Duet will fill the remainder of the 8 digits with '0' if they are not programmed.

Examples:

Message	NVM data	Data transmitted
Test Call ID only	602	60200000
Test Call ID + Partition	60201	60201000
Test Call ID + Partition + Zone	60201006	60201006
PSTN Line Fail	351	35100000
PSTN Line Fail+ Partition + Zone	35101015	35101015
GSM Line Fail	353	35300000
GSM Line Fail + Partition + Zone	35302005	35302005
Input 1	130	13000000
Input 2	137	13700000
Input 3	133	13300000
Input 4	134	13400000

Notes (Contact ID Format):

1. The 4, 5 or 6 digit account number, the Contact ID identifier '18' and the Alarm/Restore digit ('1' or '3') will precede these codes.
2. The checksum will be calculated and appended to the data.

7.4.3.3 For **SIA Format** the string should contain 2-letter SIA event code, plus any partition, zone or user information, up to a maximum of 8 characters. The SIA restore letters are programmed into another column.

Examples:

Message	SIA data	Restore
Test Call Manual	RX	
Test Call Periodic (Auto)	RP	
PSTN Line Fail	LT1	LR
GSM Line Fail	LT2	LR
Input 1	BA01	BR
Input 2	TA01	TR
Input 3	BA03	BR
Input 4	BA04	BR

Notes (SIA Format):

For the SIA restore message, the 2 characters in the Restore column will replace the first 2 characters in the data column to produce the new string. The remaining 6 characters in the data column will be unchanged.

8. FLT Output Relay

The FLT relay contacts, C, NO and NC are used to provide a 'fault' output.

Both the wired and radio paths are continuously monitored. Should both wired and radio paths fail simultaneously, then the FLT relay will energise and the contact will change over.

Where only one path has been enabled and this fails, then the FLT relay will energise and the contact will change-over.

9. SMS Output Control

Four open collector outputs may be controlled remotely using SMS. See page 15 for connection and commands.

Note: For SMS Command table, see Appendix 2.

10. Ringing on PSTN

If incoming ringing is detected on the PSTN line, the Duet will switch the alarm control panel over to the PSTN line and continue monitoring for the alarm control panel off-hook condition.

When alarm control panel off-hook is detected, the Duet will operate the Line Divert relay to isolate any associated phones while the panel is in download mode. As soon as the alarm control panel on-hook is detected, the Line Divert relay will be released and normal operation of the Duet will continue.

11. Ringing on GSM

When incoming ringing is detected on the GSM path, the Duet will answer the call and go into 'Download' mode. This will allow remote programming / interrogation of the Duet. See the D2454 Programmer Manual for details. It is also possible to request the Duet to call the D0154 Remote Server via GPRS for the purposes of remote programming (D0154 is a stand-alone computer program available from Dycon).

12. NVM Programmable Options

Please refer to the Duet's NVM specifications, being the definitive reference on the NVM programming details. The maximum call log size, using 93C86 NVM, is 63 events.

13. Engineer Receiver Function

An engineer receiver function exists in the Duet whereby it can receive calls on the GSM network, handle them as if they came from an alarm control panel, and put them into the NVM for further processing. (Normally this would be to send them out on either or both of the SMS channels).

The GSM receiver function can be enabled in the NVM System information screen.

Note: If this function is selected, then the corresponding function 5.7 will be disabled.

14. Aerial Siting

The aerial should be mounted **vertically** at the point of strongest signal. This is usually the highest point in the building (often the loft area). **ALWAYS** do a site survey to find the area of strongest signal **before** installation.

Large metal structures can affect radio signals. Avoid installing the aerial directly under metal roofs or within metal-skinned buildings because this **will reduce the signal strength and may inhibit operation completely**. If this is unavoidable, the strongest signal will be found away from the metal roof or close to large external windows or skylights.

Avoid installing the aerial close (2 metres) to cable runs, ducting, structural metalwork, metal pipes, water tank, electronic equipment, e.g. photocopiers, fax machines etc. These can have similar effects as metal roofs.

The signal strength LEDs on the Duet (see Fig 1 and 2 and Appendix 1) will give an indication of signal strength that the unit is receiving from the GSM Network.

Note: These LEDs will not work with GSM and SMS disabled in NVM.

- | | |
|---------------------|------------------------|
| 1. Green On | High signal strength |
| 2. Red and Green On | Medium signal strength |
| 3. Red On | Low signal strength |

Reliable operation is unlikely with low signal strength. If the LED shows that the signal strength is low, you should improve the signal strength. This may be achieved by repositioning the aerial. The GSM aerial lead should **not** be cut or extended, therefore repositioning the aerial may require that the Duet is also repositioned.

You can use a Duet, aerial and fully charged battery to survey a proposed site for the point of strongest signal. Ensure that the Duet is fitted with a SIM Card and NVM and that it is fully operational. Walk around the site carrying the Duet, aerial and battery observing the signal strength LEDs. When you have identified the point of the strongest signal, make a note of this point and use it when installing the aerial.

To identify the best location for the aerial, use the D2366 Test Meter.

You can also use a mobile GSM telephone to show GSM signal strength. The signal strength indicator is normally a bar or line at the side of the display on the mobile telephone.

Note: The GSM mobile telephone **MUST** use the same GSM network as the Duet's SIM card uses. A portable GSM telephone that uses a different GSM network will **NOT** show the correct signal strength.

There are often two or more separate GSM networks provided by different Service Providers. In the UK, GSM networks are operated by Vodafone, O2, Orange and T-mobile.

Remember: It is **always** easier to find the point of strongest signal **before** the equipment is fitted to a wall. Moving aerials, cables, trunking etc... after installation is wasted time and effort.

15. SIM Card

A suitable GPRS/GSM SIM card may be obtained from your GSM service provider. Check if a GSM SIM card has already been fitted by your Duet supplier.

Ensure that the SIM Card is enabled for 'Data' and 'GPRS'. The Duet will **not** send alarms if enabled for 'Speech Only'. Ensure that the SIM card is enabled for incoming and outgoing SMS messages. The Duet will **not** send SMS messages if 'outgoing SMS messages' are not enabled. The SIM card has a number printed on it. This is the SIM card's Serial Number. It is recommended that this number is recorded on the site records that will be stored at your office. It will not be possible to use the GPRS network if GPRS is not enabled.

Note: Most SIM cards are supplied for portable telephones and are only enabled for speech and SMS; as such, they will not allow the Duet to send alarms. These SIM cards may be enabled for 'Data' by your GSM service provider.

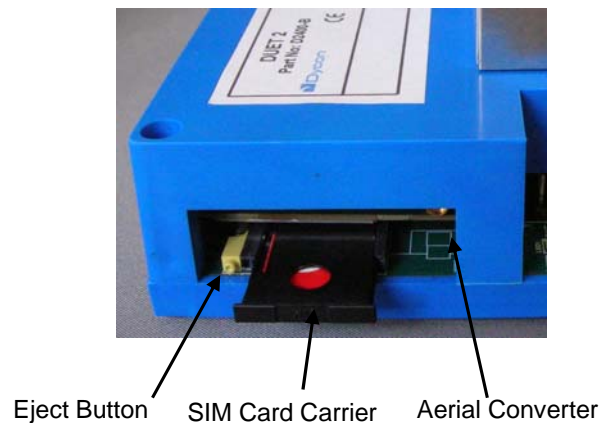


Fig 2

Using a ball-pen or pencil, push the eject button. The SIM card carrier will slide out of the Duet. Fit the SIM card into the SIM card carrier. **Wipe the SIM gold contacts with a clean tissue or cloth. Do not touch the gold contacts with fingers.** Slide the SIM card carrier into the Duet with the **SIM card gold contacts facing down**. Ensure it is pushed fully in. See Fig 2.

16. Duet Mounting

The Duet may be mounted in the alarm control panel. Alternatively, any suitable sized case may be used. For security installations a tamper protected enclosure will be required.

17. Security

The Duet should be protected from physical assault and tampering by being fitted inside a tamper-protected enclosure forming part of the alarm system.

The Duet has two independent methods of stopping unauthorised up/downloading. These security features are for up/downloading only. They do **not** operate when the NVM is removed from the Duet and is plugged into a NVM programming socket connected to a PC.

A 'call-back' telephone number may be programmed so that the Duet always calls to its preset 'call-back' engineering number whenever up/downloading is requested.

A 6-digit access code must be programmed. The Duet requires this code whenever up/downloading is requested, and when receiving SMS messages.

Note: These up/downloading security features are **NOT** activated when the Duet is supplied. Use of one or more features is recommended.

Refer to the D2454 Programmer Manual for full programming information.

18. SMS Messages

SMS commands may be in upper or lower case. Upper case is shown in these examples for clarity.

Should an invalid message be received, a reply to the sending phone will be sent, informing them of the fault. Other status messages may be sent to the Duet. A full list of the available SMS messages can be found in Appendix 2. If 'SMS confirm' is not ticked in the D2454 programmer, confirmation SMS messages will not be sent to the calling phone.

Replies will be sent using the 'Site Address' information from the NVM. By default this text is 'Duet:'

18.1 Software Version

Sending the keyword VER will result in the Duet replying with its software version number, e.g. 0102
Duet GPRS>

18.2 Status

Sending a blank command, i.e. nothing after the security code (e.g. 123456), the Duet will reply with a status message. This will consist of the following:

Status : PSTN{downtime} : GSM{downtime} : Signal{GSM Signal level} : Line{PSTN Line status} :
Bat{Battery voltage}.

{downtime} is given in hours; e.g. 14.5 = 14 hours 30 mins.

{GSM signal level} is given in CSQ (value from 0 - 31); e.g. 16

{PSTN line status} is a bit map of faults, where 0 = no fault

{Battery voltage} is a true voltage reading; e.g. 12.8 = 12.8 volts.

e.g. Duet: Status: PSTN 28.2: GSM .0: Signal 16: Line 01: Bat 13.4

18.3 Output Control

The Duet has 4 open collector outputs that may be controlled remotely using the remote programmer (D2454) or via SMS. Several message types may be sent.

- 1) Output **n ON** or Output **n OFF**. Where 'n' is the output (1 – 4).

If output '0' is sent, all outputs will be switched either **ON** or **OFF** as the case may be.

The numerical equivalent of this command is **1n1** or **1n0**.

- 2) Additionally several outputs may be changed at once, using the **ON** or **OFF** commands, for example ON 13 will switch **ON** outputs 1, 3 whilst OFF 24 will switch **OFF** outputs 2, 4.

Each output has a dedicated timer. If set to 0, that output will be disabled. If set to 99m99s that output will **NOT** time out. Any other time from 00:01 to 99:98 will operate the output for that length of time and then switch off. (The **OFF** command effectively sets the running timer to 0)

The status of the 4 outputs can be checked by sending the 'O' command with no parameters.

A Reply message will be sent to the calling phone, confirming current state of all 4 outputs. (In reality it sends the numbers of the outputs that are **ON**, the remaining being **OFF** by implication.)

e.g. Duet: Outputs 3,4 ON

18.4 Remote Reset

This is a specific command to operate Output 4. Output 4 timer should be set for 3 seconds duration. The format of the command is 'RR'. It operates in exactly the same way as the commands ON 4, or 141, or O 4 ON.

A reply will be sent to the calling phone: Duet: Remote Reset.

18.5 SMS number change

Sending the keywords **SMS1** or **SMS2** will cause the Duet to extract the calling phone's number from the incoming SMS message and store it in SMS number 1 or 2. (SMS0 will store it in both).

A reply will be sent to the calling phone: Duet: SMS number changed >+447890123456.

18.6 Account number

There are 4 account numbers. This command is in the format ACn aaaaaa, where **n** is 1 for GSM, 2 for PSTN, 3 for GPRS, 4 for LAN and 0 will change all 4. 'a..a'.is the account number (up to 6 digits long). If the account number is blank, it will be erased.

The numerical equivalent of this command is 20, 21, 22, 23, 24.

Note: In the Duet only the PSTN account number is used. Thus only commands AC0, AC2, 20, 22 should be used.

A reply will be sent to the calling phone. e.g. Duet: Account changed>1234

18.7 GPRS IP address and port

The 4 GPRS IP addresses and port numbers may be changed by using the commands **3n** and **5n** respectively. For example 31 192.168.100.3 will change the first GPRS IP address. 53 5021 will change the third port number (i.e. the first polling port number).

A reply will be sent to the calling phone. e.g. Duet: IP port changed>10500

18.8 LAN IP address and port

The 4 LAN IP addresses and port numbers may be changed by using the commands **4n** and **6n** respectively. For example 42 192.168.100.3 will change the second LAN IP address. 60 5021 will change all 4 port numbers.

A reply will be sent to the calling phone. e.g. Duet: IP addr changed>192.168.0.123

18.9 Telephone and Callback numbers

There are 2 telephone numbers for alarms, and one callback number. The command is **7n**. For example 71 01895474474 will change the first telephone number, and 77 192.168.100.10:45678 will change the Callback number. Note the callback number should be an IP address for use by either GPRS or LAN. The command **70** will change both telephone numbers.

A reply will be sent to the calling phone.

e.g. Duet: Callback number changed>81.138.0.32:1205

18.10 GSM numbers

The 2 GSM numbers may be changed by using the command **8n**. For example 81 078781234567 will change the first GSM number.

A reply will be sent to the calling phone. e.g. Duet GSM number changed>07890123456

18.11 Call the Download Server

Sending the keyword **CALL** will result in the Duet calling the Download Server. The Download Server's IP address and port must have been pre-programmed into the 'Callback' number of the Duet. GPRS and/or wired download must have been enabled in the Duet.

If the call cannot be made by virtue of NVM parameters not being correct, the message 'Callback disabled' will be sent to the calling phone, otherwise the message 'Calling Downloader' will be sent.

18.12 Test Calls

Sending the keyword **TEST** will result in the Duet triggering its normal test call sequence. A reply will only be sent to the calling phone if the Duet is programmed to send SMS messages to that phone normally.

18.13 RESET

Sending the keyword **RESET** will result in the Duet restarting, by operation of the watchdog circuit. A reply will be sent to the calling phone before the reset takes place.

18.14 SMS Invalid

Should an invalid command be received the following reply will be sent: Duet: Invalid Command

19. Using the D2355 Wired LAN Card

The wired LAN Card is a plug-on board that allows the Duet to be connected to a LAN. This typically will be a LAN for office computers where cabling is Cat 5 or higher UTP cable and connectors are RJ45 type.

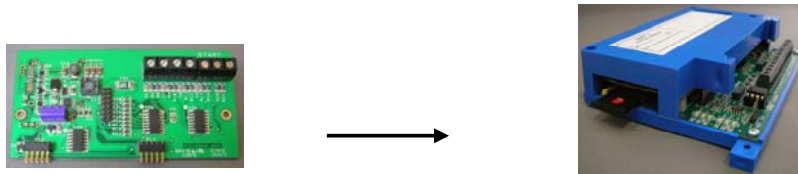


Fig 4

The LAN must:

1. Have a route to the internet. This typically will be by ADSL or ISDN communications. Without this, the wired LAN card **will not** operate.
2. Have a DHCP server function so that the wired LAN card will automatically be given an IP address on the LAN whenever it is powered. Without this, the wired LAN card **will not** operate.

Other LAN configurations are available and in most cases, the wired LAN card can be configured for these. However, descriptions of these are beyond the scope of this manual. Please ensure that you are fully conversant with IP, Internet and LAN conventions then contact your Duet supplier.

19.1 To install:

1. Remove power to the Duet when fitting or removing the wired LAN card.
2. Slide the wired LAN card into the two guides on the Duet with the metal boxed socket towards the Duet centre. Push the wired LAN card down to ensure it connects fully to the Duet.
3. Using a Cat5 lead fitted with RJ45 connectors, connect the metal boxed socket on the wired LAN card to a LAN connection point.
4. Re-connect the power supply.

19.2 Operation

On the metal boxed socket, where the LAN cable connects are yellow and green LEDs. When properly connected, the yellow LED will be on solidly and the green LED will blink on once every 1-2 seconds.

Note: Any extra inputs or outputs on the LAN card are not available for use with the Duet. The 4 inputs and 4 outputs are on the Duet's main board.

20. System Power Supply and Battery

The Duet requires a supply of 12-13.8 volts DC at 60mA in standby and 100mA when activated, and a battery capable of delivering bursts of up to 2A when the radio module is signalling. The installer must ensure that the alarm system's power supply is rated to provide adequate power for this apparatus and for any other auxiliary apparatus drawing power from the alarm system's power supply.

The power supply battery will be automatically tested with a short duration high current pulse every hour. If the battery fails this test, a low battery signal will be transmitted to the Alarm Receiving Centre.

If the Duet receives its power from a power supply that is additional to the alarm system, ensure that the 0 volt connection on the additional power supply is connected to the 0 volt connection on the alarm system.

Only power supplies conforming to EN60950 or International Safety Standards should be used with this apparatus. In Europe the power supply must meet the requirements of the European Directives and carry the EC symbol.

If the supply voltage falls to the 'low battery voltage' limit, the Duet will send a 'low-battery' signal to the ARC. When power is restored above 12.0 volts a test call (i.e. a battery voltage restore signal) will be sent to the ARC.

Note: When the supply voltage to the Duet continues to fall below 10 volts, there will be insufficient power for the unit to operate correctly, i.e. it will not send alarm calls to the ARC or send SMS messages to mobile phones.

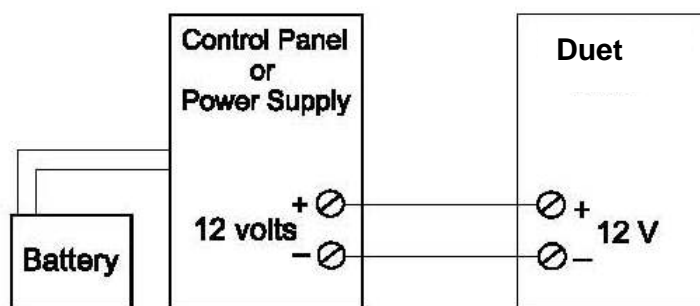


Fig 5

21. NVM Programming

The operating parameters for the Duet, e.g. telephone numbers, are stored in the NVM (Non Volatile Memory). The NVM can be programmed by downloading to the Duet via GSM or by using the D2454 NVM programmer connected to a PC.

Refer to the D2454 Programmer Manual for full programming details.

21.1 Calling

1. Two IP addresses for GPRS alarm calls
2. Two IP addresses for LAN alarm calls
3. Two GSM Numbers for alarm reporting
4. One GSM Number, or IP address, for Secure Callback
5. Two SMS phone numbers
6. Two IP addresses for polling over GPRS
7. Two IP addresses for polling over LAN

21.2 Automatic Test Calls

Periodic test calls can be sent at intervals of 1 to 99 seconds, minutes, hours or days. These timings may be selected as **Dynamic** (i.e. since the last call), or **Static** (i.e. at fixed intervals). Test calls may be sent on any/all signalling paths, i.e. LAN, GPRS, GSM, and SMS text.

Note: If programmed for interval of **0**, no calls will be made.

21.3 Polling Calls

Polling calls can be sent at fixed intervals of 1 to 99 seconds, minutes, hours or days. Polling calls may be sent via LAN or GPRS paths only.

Note: If programmed for interval of 0, no calls will be made.

21.4 PSTN Line Monitoring

- 24 Hour DC voltage
- Regular dial tone detect
- Off hook detect

21.5 SMS (Short Message Service)

In addition to sending alarm signals to an Alarm Receiving Centre via the wired or radio paths, the Duet can send text messages to one or two GSM mobile telephones.

These text messages may be used to report an alarm event to other people, e.g. the premises' key holder or owner, an alarms installation engineer etc...

Note: SMS messages are not delivered immediately. Most messages take only a few seconds to arrive but you should expect up to 20 minutes delay (or longer) during busy periods.

The text message(s) are programmed into the NVM and can identify the site, the alarm event and monitoring information, e.g. low battery voltage.

Some service providers offer a facility where an SMS message may be sent to a pager as well as GSM portable telephones. They may also offer 'broadcast SMS' where one message may be sent onto many portable telephones. Contact your GSM service provider to determine if this facility is available in your area.

APPENDIX 1

LED Indications

The **Signal Strength LEDs** are Red and Green. See Fig 6, page 22.

When the Duet is not triggered, these give an indication of the GSM radio signal strength received at the Duet. A 'once per second' short off-blink shows all is OK.

The Signal Strength LEDs will give a signal strength indication after the Duet has been powered for 30 seconds.

LED Green On, Red Off	High received GSM signal strength
LED Red and Green On	Medium received GSM signal strength
LED Red On, Green Off	Low received GSM signal strength
LED Red Off, Green Off	GSM radio cannot hear any base stations, GSM path fault or signal strength = 0
Either or both LED(s) On + short off-blink every second	GSM radio can communicate with a local base station, GSM path status = OK
LED Green flash once, then Red flash 3 times	Start of initialisation after a power-up or reset
Both LEDs on + Fast Flash	Initialising and waiting for SIM card ready

The **GSM LED** is Yellow. See Fig 6, page 22.

LED off	GSM Radio is not powered
LED on	GSM Radio module is initialising
LED slow flashes	Module powered and communicating correctly with GSM network

APPENDIX 1

LED Indications (cont'd)

The Radio Communication LED is Yellow. See Fig 6, page 22.

LED off	GSM disabled in NVM programming, or Enabled but no GSM line activity and no GSM faults detected
LED flashing on/off	NVM is blank, faulty or incorrectly programmed
LED On solid	Initialisation after a power-up or reset
LED medium flash	Dialling the receiver at the ARC
LED rapid flash (On and Off 12 times per sec)	Handshake received from ARC, sending data to receiving equipment
LED 6 slow flashes (On and Off 2 times per sec)	Communications successful. Data received correctly at ARC receiving equipment
LED on for 2 sec then 3 blinks off	Up/downloading from D2454 Programmer
LED rapid flash (On and Off 12 times per sec)	SMS Text being sent

Radio Path Failure Indications:

The yellow Radio LED will flash to indicate the type of failure. If more than one type of failure is detected, only one will be displayed.

1 flash	No response from GSM radio network. Check aerial, signal strength, and that the service provider is still providing a service (paid the bill?)
2 flashes	No response from GSM radio module
3 flashes	There is no SIM card fitted, or it is not fitted correctly
4 flashes	The SIM card is locked. The PUK1 code is required to unlock it
5 flashes	The SIM card PIN number is missing or wrong
6 flashes	The SIM card SMS Message Centre telephone number is invalid
7 flashes	GSM radio module fault detected by internal tests, replace unit

APPENDIX 1

LED Indications (cont'd)

The **PSTN LED** is Red. See Fig 6, page 22.

LED off	PSTN disabled in NVM programming, or enabled but no PSTN line activity and no PSTN faults detected
LED on solid	On line
Ringing flashes in sync with the ringtone	Incoming ringing is detected and this may inhibit the Duet from making a telephone call
1 flash	PSTN telephone line DC voltage is very low or absent
2 flashes	Another phone (or fax, etc.) on the same PSTN line is off-hook
LED on for 2 sec then 3 off blinks	Up/downloading to the alarm control panel

The **LAN Communication LED** is Green. See Fig 6, page 22.

LED off	LAN path not activated. Enabled but no LAN line activity and no LAN faults detected
LED on solid	On line
LED slow flash	LAN path active. Dialling complete, waiting for connection to ARC
LED medium flash (On & Off 5 times/sec)	LAN path active. Connected to ARC waiting for handshake
LED rapid flash (On & Off 12 times/sec)	LAN path active. Handshake received, sending data to ARC
LED 6 medium speed flashes.	Communications successful, data received correctly at ARC

LAN Failure Indications:

The green LAN LED will flash to indicate the type of line or communication failure. If more than one type of failure is detected, the lowest number will be displayed.

1 flash	Unable to communicate with the plug-on LAN card
2 flashes	LAN path failure. 3 sequential LAN calls have failed

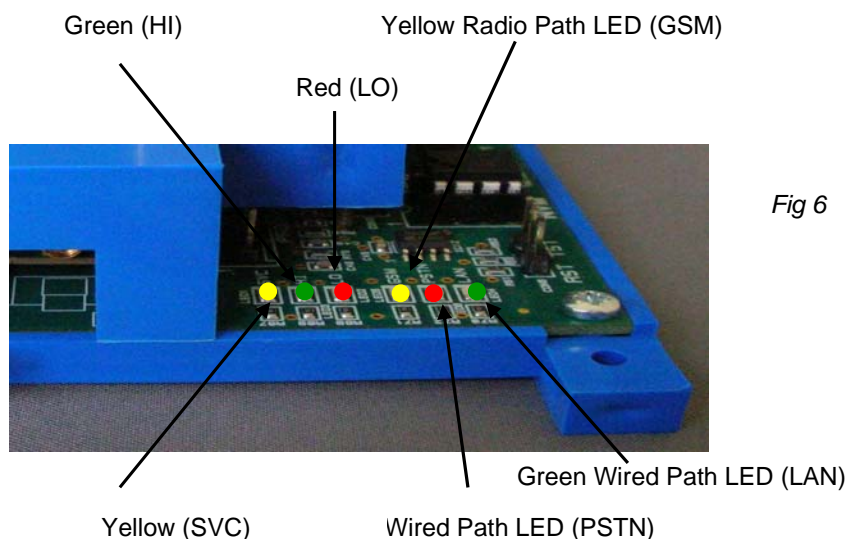


Fig 6

APPENDIX 2

SMS Command Table

Function	Security Code	Text Command	Numerical Command Data		Notes
Status	123456				Unit will respond with SMS message showing system status.
Software Version	123456	VER			Unit will respond with 0102 Duet GPRS>
Test Call	123456	TEST			Unit will start a manual test call sequence.
Remote Reset	123456	RR			Unit will respond with SMS message showing the status of all outputs.
Reset	123456	RESET			Unit will respond with SMS message and then do a watchdog reset.
Call Downloader	123456	CALL			Unit will call the remote downloader via GPRS or LAN.
Output n ON	123456	O n ON	1n	1	Unit will respond with SMS message showing the status of all outputs (n=0,1,2,3,4)
Output n OFF	123456	O n OFF	1n	0	Unit will respond with SMS message showing the status of all outputs. (n=0,1,2,3,4)
All outputs ON	123456	O 0 ON	10	1	Unit will respond with SMS message showing the status of all outputs
Several outputs ON	123456	ON 134			Unit will respond with SMS message showing the status of all outputs
SMS number change	123456	SMSn			Unit will respond with SMS number changed>+447890123456 (n= 0,1,2)
SMS text change	123456	SMS TAny text			Unit will respond with SMS text changed
Account number change	123456	AC0 1234	20	1234	Change all account numbers to 1234. Unit will respond with SMS message Account Changed
Account number change	123456	AC1 567890	21	567890	Change GSM account number to 567890. Unit will respond with SMS message Account Changed

APPENDIX 2

SMS Commands Table (cont'd)

Function	Security Code	Text Command	Numerical Command Data		Notes
IP address change	123456		30	172.16.1.2	Change all GPRS IP addresses to the given one. Unit will respond with GPRS IP changed
IP address change	123456		3n	172.16.1.2	Change GPRS IP address (n=1-4) to the given one. Unit will respond with GPRS IP changed
IP address change	123456		40	192.168.1.20	Change all LAN IP addresses to the given one. Unit will respond with LAN IP changed
IP address change	123456		4n	192.168.1.20	Change LAN IP address (n=1-4) to the given one. Unit will respond with GPRS IP changed
IP port change	123456		50	8021	Change all GPRS IP ports to the given one. Unit will respond with GPRS Port changed
IP port change	123456		5n	8021	Change GPRS IP port (n=1-4) to the given one. Unit will respond with GPRS Port changed
IP port change	123456		60	28021	Change all LAN IP ports to the given one. Unit will respond with LAN Port changed
IP port change	123456		6n	28021	Change LAN IP port (n=1-4) to the given one. Unit will respond with LAN Port changed
Telephone number change	123456		7n	01443471060	Change telephone numbers. (n=0,1,2; 0=both). Unit will respond with PSTN number changed
Callback number change	123456		77	192.168.1.20:8080	Change callback number. Unit will respond with callback number changed
GSM number change	123456		8n	01443471060	Change GSM numbers. (n=0,1,2; 0=both). Unit will respond with GSM number changed

APPENDIX 2

SMS Command Table (cont'd)

Function	Security Code	Text Command	Numerical Command Data		Notes
Invalid Command	123456	Anything not listed above			Unit will respond with SMS message showing: INVALID COMMAND
Invalid Security Code	654321				Unit will respond with SMS message showing: INVALID CODE

Notes:

The security code must be 6 digits in length.

The text command OR the numeric command + data may be used.

The fields 'security code', 'command' and 'data' may be separated by zero or more spaces - e.g. the following are valid commands: 123456 O 1 ON or 123456O2OFF

GPRS IP addresses 31 and 32, and ports 51 and 52 are for alarm calls only.

GPRS IP addresses 33 and 34, and ports 53 and 54 are for polling calls only.

LAN IP addresses 41 and 42, and ports 61 and 62 are for alarm calls only.

LAN IP addresses 43 and 44, and ports 63 and 64 are for polling calls only.

APPENDIX 3

ADSL (Asynchronous Digital Subscriber Line) or 'Broadband'

When an analogue PSTN telephone line also carries ADSL (Broadband) signals and it is used by a security system e.g. the Duet, then a Security ADSL filter MUST be used.

A filter is used to separate the analogue telephone signals from the ADSL (broadband) digital data signals because the **phone or security system** may be **disrupted or completely inhibited** if ADSL (broadband) digital data is allowed into them from the telephone line.

The D0730 Security ADSL Filter is designed specifically for use with security systems. It includes spare terminals to aid wiring that are labelled 'Pass Through'. This item meets all of the requirements of the British and European telephone and security standards.

Other types of filter and plug-in filters **should not** be used for series connection of a security system to the telephone line. These types are for use with telephones, fax machines etc...

Plug-in filters are available from the telephone service provider and many electrical distributors including:

CPC Part Number: TE 04367 or TE04070
Farnell Part Number: 418-5328 or 506-0205
Maplin Part Number: A61AK or A72AG



D0700 – Security
ADSL Filter

Fig 7

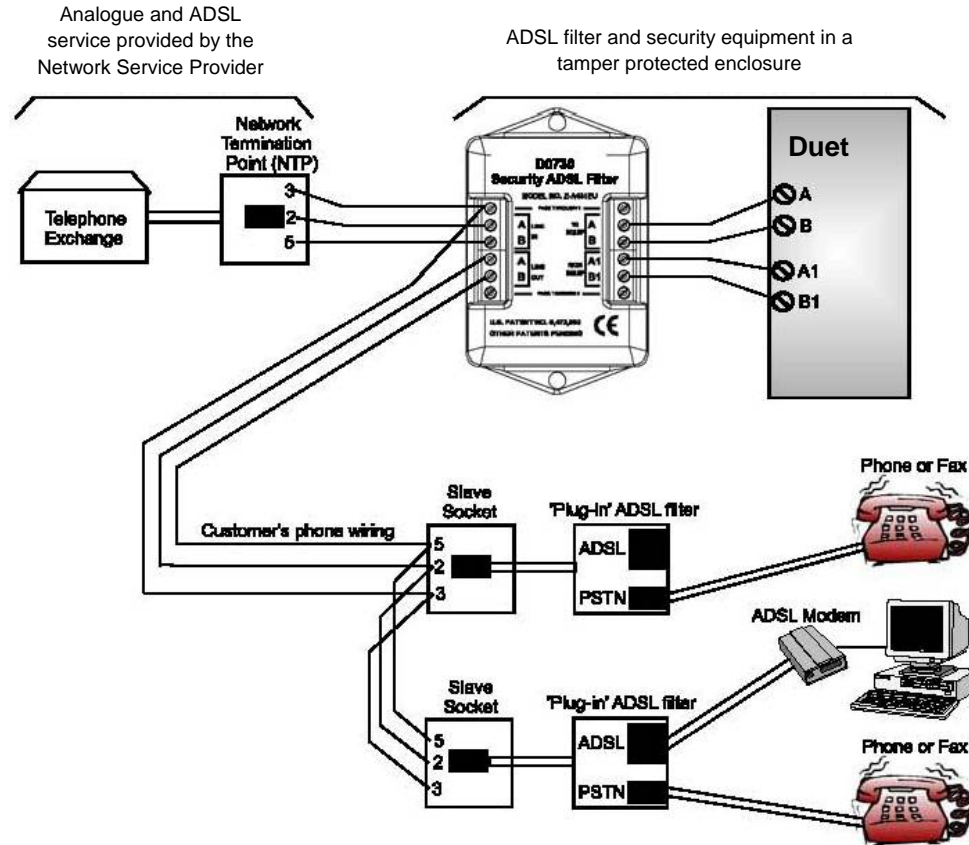
Serial connection to a PSTN (and broadband) telephone line is shown in Fig 8.

The installer must ensure that:

1. The user's telephone wiring is disconnected from the NTP and reconnected to the D0730 ADSL Filter only.
2. The NTP connects **only** to the D0730 ADSL Filter and to **no other** wiring or telephone sockets.
3. The wiring between the NTP and the D0730 ADSL Filter **cannot** be unplugged by the user.
4. The user **cannot** plug a phone/fax etc. into the NTP.
5. The terminals 2, 3 and 5, A and B and A1 and B1 are connected exactly as shown.

APPENDIX 3

ADSL (Asynchronous Digital Subscriber Line) or 'Broadband'



PSTN Connection using the D0730 Security ADSL Filter

Fig 8

Q. Why is a Broadband Filter necessary?

A. When ADSL (broadband) digital data is supplied on a normal PSTN telephone line then... an ADSL (broadband) filter **must** be fitted between that telephone line and each item of 'non digital' equipment because the operation of 'non digital' equipment may be **disrupted or completely inhibited** if ADSL (broadband) digital data is allowed into it from the telephone line.

'Non digital' equipment means anything that would be used on a normal analogue PSTN telephone line, i.e. a phone, fax machine, Duet, digital communicator, control panel digi-modem.

APPENDIX 4

Specification

Models	D2600-B Duet2 D2650 Duet3
Dimensions (h x w x d)	25 x 175x 120 mm
Weight	200 grams
Telephone Path	PSTN technology, CTR21 approved
Radio Path	GSM
Power Requirement	12.0 - 13.8volts DC, 0.1volt max ripple
Current Consumption	60mA quiescent, 100mA operating
Low Battery	10.8-11.0 volts falling, 11.8-12.0v recovery
Outputs	Aux = 1 changeover relay (24v 1A contacts) Prog = o/c 100mA to 0v
Temperature	-20C to +60C transit, -4C to +50C operating
Humidity	0 - 80% non-condensing
Mounting	Any orientation
Warranty	2 years

Regulatory Constraints

Before attempting to install the Duet, the installer must be aware that the Duet may only be installed by a professional installer.

The Ringer Equivalence Number (REN) of the apparatus is 1.0. The sum of RENs of the individual items connected to any one analogue PSTN line should not exceed 4.

APPENDIX 5

European PSTN Approval

The Duet product range meets the requirements of the EU PSTN standard CTR21 and is approved for connection to any exchange line forming part of a Public Switched Telephone Network (PSTN).

AHCTR210 001 Declaration of Network Compatibility

The equipment has been approved in accordance with Council Decision 98/ / EC (5) for pan-European single terminal connection to the Public Switched Telephone Network (PSTN). However, due to differences between the individual PSTNs provided in different countries, the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point.

In the event of problems, you should contact your equipment supplier in the first instance.

AHCTR211 001 Statement to Notified Body, Vendor and User

The equipment has been approved in accordance with Council Decision 98/ / EC (5) for pan-European single terminal connection to the Public Switched Telephone Network (PSTN).

The equipment has been designed for use in all 17 EU countries, plus Switzerland, but may have interworking difficulties in Germany and Greece.

Approval Authority: CE0168

Approval Number for Duet range: 608777

International GSM Approval

The Duet product range incorporates an independently tested and approved GSM radio module that meets the requirements of International radio communication standards.

The GSM Radio Module Approval Authority is: 0681

APPENDIX 6

Glossary of Terms

ADSL	Asynchronous Digital Subscriber Line A 'wideband' digital communication service from a network provider to a subscriber that carries a high volume of digital data, most commonly for internet access. Sometimes called 'broadband'. An ADSL service is often provided with a simultaneous analogue PSTN service on a hybrid line.
Analogue PSTN	Analogue Public Switched Telephone Network The analogue national telephone system. Often just called the PSTN. Service is available to customers on twisted-pair wires that carry a DC supply provided from the network telephone exchange.
APN	Access Point Name Identifies an external network that is accessible from a mobile terminal. E.g. The APN for Vodafone is "internet".
ARC	Alarm Receiving Centre See ARS.
ARS	Alarm Receiving Station A 24 hour manned centre (often privately owned & operated) capable of receiving and logging calls of alarm and forwarding them to security authorities and other relevant services. Often called a central station.
Broadband	See ADSL.
Call Clearing	See 3-way-calling.
Call Minder	A call answering service offered by some telecomm Service Providers where an incoming call to the subscriber's telephone is not answered.
Central Station	See ARS.
CONTACT I D	Contact Identification An alarm reporting protocol of DTMF tones used to send via an Analogue PSTN telephone network a transmission to receiving equipment at an ARC, and to receive checking and acknowledgement replies from that receiving equipment. The Contact ID protocol is commonly used in burglar or intrusion alarm equipment. See also DCID.
Digital CONTACT ID	Digital Contact Identification An alarm reporting protocol of data used to send via an Analogue PSTN telephone network or a digital data network, e.g. VDN, GPRS, GSM data, a transmission to receiving equipment at an ARC, and to receive checking and acknowledgement replies from that receiving equipment.
Digital PSTN	Digital Public Switched Telephone Network The digital national telephone system. Service is available to customers on twisted-pair wires that carries a DC supply provided from the network telephone exchange, on optical fibre or other digital transmission medium. The digital service may be in ISDN format or another digital format.
DTMF	Dual Tone Multi Frequency The series of tones used by telephones to send dialling information to an analogue PSTN exchange. These tones are also used by the DTMF Fast Format and Contact ID alarms reporting protocols.

APPENDIX 6

Glossary of Terms (cont'd)

DTMF Fast Format	<p>Alarms Reporting Protocol</p> <p>A protocol that is a sequence of analogue tones (push-button telephone tones) used to send via telephone lines a transmission to receiving equipment at an ARC, and to receive checking and acknowledgement replies from that receiving equipment. 8 or 16 channel DTMF Fast Format protocol is commonly used in burglar or intruder alarm equipment.</p>
Dualcom96	<p>Alarms Reporting Protocol</p> <p>This protocol is used by Duet to send transmissions to receiving equipment at an ARC, and to receive checking and acknowledgement replies from that receiving equipment. This is a modem type protocol.</p>
EEPROM	<p>Electrically Erasable Programmable Read Only Memory</p> <p>A type of NVM. See NVM.</p>
GSM	<p>Global System for Mobile Communications</p> <p>Digital telephone service particularly (but not exclusively) for users that may be mobile for carrying digital data, speech or fax, where the path from the user is by a radio link to one (or more) fixed sites.</p>
GPRS	<p>General Packet Radio System</p> <p>A digital telephone service for users that may be mobile for carrying digital data (typically internet) where the path from the user is by a radio link to one or more fixed sites.</p>
Hybrid Line	<p>A line that carries digital data and analogue signals simultaneously. Most commonly this is an ADSL digital service and an analogue telephone service on one line from a Service Provider to a subscriber.</p>
NTP	<p>Network Termination Point</p> <p>A telephone line is terminated at the users premises by a Network Termination Point which is provided by the Telecoms Service Provider. This is a socket or connection where the user's equipment can be connected.</p>
NVM	<p>Non Volatile Memory</p> <p>An integrated circuit memory device that does not need any power to remember data.</p>
PABX	<p>Private Automatic Branch Exchange</p> <p>A small telephone exchange for use within one building or group of buildings. Commonly used in businesses where each phone in that business is an extension on that PABX. Usually connects to one or more analogue PSTN or ISDN telephone lines.</p>
PSTN	<p>Public Switched Telephone Network</p> <p>A national telephone system. This may be analogue and/or digital. See Analogue PSTN.</p>
SMS	<p>The GSM Short Message Service</p> <p>Service provided by companies supplying a GSM communications system where a short text message may be sent to (and from) GSM mobile phones and read on the GSM mobile phone display.</p>
SMS Message Centre	<p>SMS messages are not sent 'directly' from one GSM phone (or <i>Duet</i>) to another GSM phone. All messages are first sent to a Message Centre operated by the GSM Network Provider and then forwarded to the selected mobile phone(s). This normally takes a few seconds but delays of 30 minutes or more may be experienced during busy periods.</p>

APPENDIX 6

Glossary of Terms (cont'd)

Terminal Adapter	A device that connects to the S-bus connection of an ISDN Network Termination Point and adapts the digital S-bus data, i.e. protocol, data speed, structure, to that required. E.g. the conversion may be to analogue PSTN or to a serial port for cable connection to a PC serial 'COM' port.
WEB SITE	The Dycon Internet Web Site The Dycon web site: www.dyconsecurity.com contains the latest copies of all manuals for all Dycon products. Please ensure that you are working from the latest version. You can also download associated information and software samplers. Dycon sales, shipping and contact information is here too.
3-Way-Calling	This is a service provided by some telecommunication service providers. BT in the UK offer this service. When a call is in progress on a telephone line it is possible to send a signal via that line to the equipment at the telephone exchange. The exchange will put the current call on 'hold' and provide a dialling tone so that another outgoing call may be made. When this second call has finished a signal to the exchange will disconnect the second call and re-connect the first one that was put on 'hold'.