# **DUOTEL PLUS**

## 2 Port Telephone Exchange Simulator



## Installation and User Manual

Issue 1.4

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## SAFETY

Read this manual completely before using the instrument.

- 1. This product is designed for use by competent personnel.
- 2. The DUOTEL PLUS is designed to look like an exchange line therefore only telecommunication apparatus designed to connect to telephone lines must be connected to it.
- 3. Under no circumstances must the DUOTEL PLUS be connected to the Public Switched Telephone Network (PSTN) or any PABX Extension ports.
- 4. When using the DUOTEL PLUS to test the performance of unapproved telecommunication apparatus, due consideration must be paid to any hazard involved.
- 5. A WARNING The sockets have high voltages present during ringing. Although this is not hazardous, it can be painful.
- 6. There are no user serviceable parts in this unit. Under no circumstances should the user attempt to open the unit. If opened, the warranty will be invalidated.

## SUPPLY

The unit is designed to be powered from a mains supply of 230 V, 50 Hz. The Plug is fitted with a 5 A fuse and the unit must be connected via the lead attached. Once power has been applied the Power-On indicator will light.

Please note that there is no power switch on the unit and the only way to isolate from the supply is to unplug the unit from the mains.

### **GUARANTEE**

Your Crucible Technologies product is guaranteed for one year from the date of purchase. Please keep your invoice as proof of purchase.

Should a problem arise with the product, please contact; **tech@crucible-technologies.co.uk** for technical assistance.

If you wish to return your product please contact; returns@crucible-technologies.co.uk to receive a returns authorisation number, and instructions for returning the product.

You will be advised of costs prior to any work commencing.

This guarantee does not affect your statutory rights.

## **OPERATING INSTRUCTIONS**

#### **Call Processing**

The DUOTEL PLUS ports are numbered 1 & 2. As soon as an extension is taken Off-hook, a dial tone will be supplied. To ring a port simply dial its number.

If an invalid number is dialled a busy tone will be supplied.

When a port has been called it will start to ring. The call is answered by the device connected to the port coming Off-hook. The two devices are then provided with a speech path. The call is ended by either device going On-hook. The system will then provide busy tone.

#### **Country Variants**

For some country variants two types of dial tone are provided. Where this is the case, type 1 is heard at port 1, and type 2 is heard at port 2.

There are a maximum of five ring cadences for each country variant. The first is used when a port is dialled directly. The remaining four are obtained by inserting a number 5, 6, 7, or 8 before the extension number, i.e. to dial extension 2 using the fourth cadence dial '72'.

The country variant is selected by dialling '#nn', where 'nn' is the code for the required variant. After this is dialled the Power LED will extinguish while the DUOTEL PLUS updates the information. Once a new country is programmed, the information will be retained in the DUOTEL PLUS even when the power is removed.

For details of the country variants see the appendix.

#### Programmable Port Numbers

With this feature, it is possible to change the port numbers.

To program the number of port 1, come Off-hook on port 1 and dial #52 followed by the number required and then followed by a \*.

To program the number on port 2, come Off-hook on port 1 and dial #53 followed by the number required and then followed by a \*.

To enable programmed numbers, dial #51.

To disable programmed numbers, and go back to numbers 1 & 2, dial #50.

#### Hot Dial Feature (known as Ring Down in the US)

When this feature is enabled, there is no need to dial. As soon as the device plugged into port 1 comes Off-hook, port 2 starts ringing. Similarly if the device plugged into port 2 comes Off-hook, port 1 starts ringing.

To enable the Hot Dial feature, come Off-hook on port 1 and dial #41. Power LED will go off and then come on when programming is complete.

To program the delay from coming Off-hook to ringing being applied, dial '#42n', where 'n' can be 1,2,3.... to 0. (0 represents a 10 second delay).

To disable the Hot Dial feature come Off-hook on port 1 and dial #40. If the delay above is set to 1 second, then this has to be done very quickly, i.e. the # has to be entered within a second of coming Off-hook.

#### Port Wiring

The socket wiring is representative of a standard BT/Cable socket with DC feed on Pins 2 and 5. The line polarity is set so that Pin 5 is Positive with respect to Pin 2, the ringing is supplied on Pin 4 and Pin 3 is not connected, this means there is no earth connection supplied.

When supplied with RJ11 adaptors, DC feed is provided via Pins 2 and 3, with Pin 3 Positive with respect to Pin 2.

#### Dialling

DUOTEL PLUS will only operate with Tone dialling.

## SPECIFICATION

FEED CONDITIONS	DC VOLTAGE	24 V
RINGING	VOLTAGE FREQUENCY CADENCE	70 V rms 16, 25 or 50 Hz Based on country specification
EXCHANGE TONES	FREQUENCY LEVEL	400 Hz -25 dBm ± 4 dB
DIAL CADENCE		Based on country specification
BUSY CADENCE		Based on country specification
RING CADENCE		Based on country specification
ATTENUATION		10 dB Port to Port
TONE DIALLING	TIME ACCEPT FREQUENCY REJECT FREQUENCY	> 60 mS ± 1.5% ± 3.5%
TOLERANCE (unless otherwise specified) POWER	FREQUENCY TIMING VOLTAGE	± 10% ± 10% ± 10%
TOWER	MAINS	230 V, 50 Hz, 50 mA

## APPENDIX

CODE	Country
00	Austria
01	Belgium
02	Cyprus
03	Denmark
04	Finland
05	France
06	Germany
07	Greece
08	Iceland
09	Ireland
10	Italy
11	Luxemborg
12	Netherlands
13	Norway
14	Portugal
15	Spain
16	Sweden
17	Switzerland
18	UK (BT ringing )
19	UK (Atlantic Telecom ringing #1)
20	UK (Atlantic Telecom ringing #2)
21	Czech Republic
22	South Africa
23	USA
24	Canada
25	Australia
26	Hong Kong
27	New Zealand
28	Turkey

29 Singapore

COUNTRY CODE 00 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	AUSTRIA 50 Hz 1000 mS ON, 5000 mS OFF 1000 mS ON, 5000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 1200 mS ON, 650 mS OFF, 300 mS ON, 250 mS OFF
BUSY TONE	300 mS ON, 300 mS OFF
COUNTRY CODE 01 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5 DIAL TONE #1 DIAL TONE #2 BUSY TONE	25 Hz 1000 mS ON, 3000 mS OFF 1000 mS ON, 3000 mS OFF 1000 mS ON, 3000 mS OFF
COUNTRY CODE 02 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	25 Hz 1500 mS ON, 3000 mS OFF 1500 mS ON, 3000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	500mS ON, 500mS OFF

COUNTRY CODE 03 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	DENMARK 25 Hz 750 mS ON, 7500 mS OFF 300 mS ON, 1200 mS OFF 500 mS ON, 700 mS OFF 750 mS ON, 7500 mS OFF 750 mS ON, 7500 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	450 mS ON, 450 mS OFF
COUNTRY CODE 04 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	FINLAND 25 Hz 1000 mS ON, 4000 mS OFF 300 mS ON, 4000 mS OFF 300 mS ON, 300 mS OFF, 300 mS ON, 4000 mS OFF 300 mS ON, 300 mS OFF, 2000 mS ON, 4000 mS OFF 300 mS ON, 300 mS OFF, 5000 mS ON, 4000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	300 mS ON, 300 mS OFF
COUNTRY CODE 05 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	FRANCE 50 Hz 1500 mS ON, 3500 mS OFF 750 mS ON, 1500 mS OFF 2000 mS ON, 1000 mS OFF 1500 mS ON, 3500 mS OFF 1500 mS ON, 3500 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF

COUNTRY CODE 06	GERMANY
RING FREQUENCY	25 Hz
RING CADENCE #1	1000 mS ON, 4000 mS OFF
RING CADENCE #2	1000 mS ON, 4000 mS OFF
RING CADENCE #3	1000 mS ON, 4000 mS OFF
RING CADENCE #4	1000 mS ON, 4000 mS OFF
RING CADENCE #5	1000 mS ON, 4000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 07	GREECE
RING FREQUENCY	16 Hz
RING CADENCE #1	1000 mS ON, 4000 mS OFF
RING CADENCE #2	1000 mS ON, 4000 mS OFF
RING CADENCE #3	1000 mS ON, 4000 mS OFF
RING CADENCE #4	1000 mS ON, 4000 mS OFF
RING CADENCE #5	1000 mS ON, 4000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	300 mS ON, 300 mS OFF
COUNTRY CODE 08 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5 DIAL TONE #1 DIAL TONE #2	ICELAND 25 Hz 1200 mS ON, 4700 mS OFF 1200 mS ON, 4700 mS OFF CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	250 mS ON, 250 mS OFF

COUNTRY CODE 09	IRELAND
RING FREQUENCY	25 Hz
RING CADENCE #1	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #2	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #3	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #4	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #5	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 10	ITALY
RING FREQUENCY	25 Hz
RING CADENCE #1	1000 mS ON, 4000 mS OFF
RING CADENCE #2	400 mS ON, 200 mS OFF, 400 mS ON, 200 mS OFF,
RING CADENCE #3	800 mS ON, 4000 mS OFF
RING CADENCE #4	1000 mS ON, 4000 mS OFF
RING CADENCE #4	1000 mS ON, 4000 mS OFF
RING CADENCE #5	1000 mS ON, 4000 mS OFF
DIAL TONE #1	200 mS ON, 200 mS OFF, 600 mS ON, 1000 mS OFF
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 11	LUXEMBOURG
RING FREQUENCY	25 Hz
RING CADENCE #1	1000 mS ON, 4000 mS OFF
RING CADENCE #2	1000 mS ON, 5000 mS OFF
RING CADENCE #3	1000 mS ON, 4000 mS OFF
RING CADENCE #4	1000 mS ON, 4000 mS OFF
RING CADENCE #5	1000 mS ON, 4000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF

DOOTLETEOS	
COUNTRY CODE 12 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	25 Hz
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 500 mS ON, 50 mS OFF
BUSY TONE	250 mS ON, 250 mS OFF
COUNTRY CODE 13 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	25 Hz 1000 mS ON, 4000 mS OFF 300 mS ON, 300 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 400 mS ON, 400 mS OFF
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 14 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5 DIAL TONE #1 DIAL TONE #2	25 Hz 1000 mS ON, 5000 mS OFF 1000 mS ON, 5000 mS OFF

BUSY TONE 500mS ON, 500mS OFF

COUNTRY CODE 15 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	1500 mS ON, 3000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 1000 mS ON, 100 mS OFF
BUSY TONE	200 mS ON, 200 mS OFF
COUNTRY CODE 16 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	SWEDEN 25 Hz 1000 mS ON, 5000 mS OFF 300 mS ON, 400 mS OFF 330 mS ON, 330 mS OFF, 330 mS ON, 5000 mS OFF 1000 mS ON, 5000 mS OFF 1000 mS ON, 5000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 350 mS ON, 50 mS OFF
BUSY TONE	250 mS ON, 250 mS OFF
COUNTRY CODE 17 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	25 Hz
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 1100 mS ON, 1100 mS OFF
BUSY TONE	500 mS ON, 500 mS OFF

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COUNTRY CODE 18 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3	UK (BT) 25 Hz 400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF 1000 mS ON, 2000 mS OFF 250 mS ON, 250 mS OFF, 250 mS ON, 250 mS OFF, 250 mS ON, 1750 mS OFF
RING CADENCE #4 RING CADENCE #5	400 mS ON, 800 mS OFF 2000 mS ON, 4000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS 750 mS ON, 750 mS OFF
BUSY TONE	375 mS ON, 375 mS OFF
COUNTRY CODE 19 RING FREQUENCY RING CADENCE #1 RING CADENCE #2	UK (ATLANTIC TELECOM #1) 25 Hz 1500 mS ON, 500 mS OFF, 500 mS ON, 500 mS OFF, 500 mS ON, 2500 mS OFF 1500 mS ON, 500 mS OFF, 1500 mS ON, 2500 mS OFF
RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	1500 mS ON, 4500 mS OFF 1500 mS ON, 500 mS OFF 500 mS ON, 3500 mS OFF 1500 mS ON, 500 mS OFF, 500 mS ON, 500 mS OFF, 1000 mS ON, 2000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	375 mS ON, 375 mS OFF
COUNTRY CODE 20 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	UK (ATLANTIC TELECOM #2) 25 Hz 1000 mS ON, 500 mS OFF, 1000 mS ON, 3500 mS OFF 500 mS ON, 500 mS OFF, 500 mS ON, 500 mS OFF, 1000 mS ON, 3000 mS OFF 500 mS ON, 500 mS OFF, 1000 mS ON, 500 mS OFF, 500 mS ON, 500 mS OFF, 1000 mS ON, 3500 mS OFF 1000 mS ON, 500 mS OFF, 1000 mS ON, 3500 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	375 mS ON, 375mS OFF

COUNTRY CODE 21 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	CZECH REPUBLIC 25 Hz 1000 mS ON, 4000 mS OFF 400 mS ON, 200 mS OFF, 400 mS ON, 3000 mS OFF 400 mS ON, 200 mS OFF, 400 mS ON, 200 mS OFF, 400 mS ON, 2400 mS OFF 1000 mS ON, 1000 mS OFF 1000 mS ON, 4000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 22 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5 DIAL TONE #1 DIAL TONE #2 BUSY TONE	SOUTH AFRICA 16 Hz 400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF 400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF 400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF 400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF 400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF 500 mS ON, 500 mS OFF
COUNTRY CODE 23 RING FREQUENCY RING CADENCE #1 RING CADENCE #2 RING CADENCE #3 RING CADENCE #4 RING CADENCE #5	USA 25 Hz 2000 mS ON, 4000 mS OFF 2000 mS ON, 4000 mS OFF
DIAL TONE #1 DIAL TONE #2	CONTINUOUS CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF

COUNTRY CODE 24	CANADA
RING FREQUENCY	25 Hz
RING CADENCE #1	2000 mS ON, 4000 mS OFF
RING CADENCE #2	2000 mS ON, 4000 mS OFF
RING CADENCE #3	2000 mS ON, 4000 mS OFF
RING CADENCE #4	2000 mS ON, 4000 mS OFF
RING CADENCE #5	2000 mS ON, 4000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 25	AUSTRALIA
RING FREQUENCY	16 Hz
RING CADENCE #1	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #2	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #3	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #4	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #5	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	375 mS ON, 375 mS OFF
COUNTRY CODE 26	HONG KONG
RING FREQUENCY	25 Hz
RING CADENCE #1	400 mS ON, 200 mS OFF, 400 mS ON, 3000 mS OFF
RING CADENCE #2	400 mS ON, 200 mS OFF, 400 mS ON, 3000 mS OFF
RING CADENCE #3	400 mS ON, 200 mS OFF, 400 mS ON, 3000 mS OFF
RING CADENCE #4	400 mS ON, 200 mS OFF, 400 mS ON, 3000 mS OFF
RING CADENCE #5	400 mS ON, 200 mS OFF, 400 mS ON, 3000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF

COUNTRY CODE 27	NEW ZEALAND
RING FREQUENCY	25 Hz
RING CADENCE #1	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #2	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #3	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #4	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #5	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	500 mS ON, 500 mS OFF
COUNTRY CODE 28	TURKEY
RING FREQUENCY	25 Hz
RING CADENCE #1	2000 mS ON, 4000 mS OFF
RING CADENCE #2	2000 mS ON, 4000 mS OFF
RING CADENCE #3	2000 mS ON, 4000 mS OFF
RING CADENCE #4	2000 mS ON, 4000 mS OFF
RING CADENCE #5	2000 mS ON, 4000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #2	CONTINUOUS
BUSY TONE	750 mS ON, 750 mS OFF
COUNTRY CODE 29	SINGAPORE
RING FREQUENCY	25 Hz
RING CADENCE #1	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #2	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #3	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #4	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
RING CADENCE #5	400 mS ON, 200 mS OFF, 400 mS ON, 2000 mS OFF
DIAL TONE #1	CONTINUOUS
DIAL TONE #1 DIAL TONE #2	CONTINUOUS
BUSY TONE	750 mS ON, 750 mS OFF



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