Bell

System

(Telephones) Ltd

Technical Support

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Troubleshooting Guide
Audio Door Entry Systems (single entrance)
(9nn, VRKn or BLn series)

Most systems use the 801 phone, 801P on systems above 20 flats.

Twisted-pair cable must be used (CW1308 telephone or Cat5e data cable). Alarm cable is not recommended and can cause problems with speech.

Phone connections

Terminal	Meaning
I	Call / call button (12V to ring)
R	Microphone
O	Common for ring, speech and lock button (0V)
T	Speaker
Z	Lock button (Z shorts to O when the lock button is pressed)
V	12V DC Phone supply (BS-LX and 500X series only)
L	Door Monitor (connecting L to 0V brings green LED on, BS-LX and 500L series only)

51 Speech unit – 12V AC or DC operation

61 Speech unit – 12V AC or DC operation

801 Series phone with Electronic ring – 12V AC or DC operation

801 Series phone with Mechanical buzzer – 12V AC only

500A, PA – 12V AC only, other 500 series 12V DC only

If a phone has 500 PAD on it check which letters are crossed out. If the A is crossed out the model is a 500PD.

BS-LX phone – 12V DC only

Common Faults

A very high percentage of calls to our technical support number, regarding new installations, are resolved to faulty wiring. The reasons for these are various: -

- Broken cores, especially short links, sometimes broken inside the insulation.
- Connectors clamped onto the insulation instead of copper.
- Short or open circuits due to cables having been stapled or nailed through.

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- A common fault is wiring a connector left to right instead of right to left, or one or more twisted pairs the wrong way round.

Tip.   The heads of screws on connectors are not a reliable means of making a connection with a meter, try pushing the probe into the wire entry point.

The following tables provide a quick indication of the possible fault:

Lock Release Problems	
Lock release does not operate.	1. Connections to the Lock release are open/short-circuited (note power supply fuse may have blown). 2. Poor connection or damaged wire in the lock release circuit. Check cable to lock release and cable to Z / O terminals on the phone. 3. Voltage drop issue; cable diameter is too small, try doubling up on the lock button cores Z & O going to the phone(s). 4. Dodgy lock release button on the phone. Simulate a lock button press by shorting Z & O to prove. 5. Lock release current is too high (if using a third party lock release). An additional relay and suitable power supply maybe required. Check the lock release current plus 0.5A for the system does not exceed the power supply rating. 6. Lock release jammed due to over tight fitting; check there is some 'play' between the lock and lock release. Do not fit the tongue on the door to deep. 7. Faulty lock release. Connect Z side of lock release to H on the speech unit to force 12V across it and test.

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Lock release buzzes, but doesn't unlock	1. Poor connection or damaged wire in the lock release circuit. Check cable to lock release and cable to Z / O terminals on the phone. 2. Voltage drop issue; cable diameter is too small, try doubling up on the lock button cores Z & O going to the phone(s). 3. Dodgy lock release button on the phone. Simulate a lock button press by shorting Z & O to prove. 4. Lock release current is too high (if using a third party lock release). An additional relay and suitable power supply maybe required. Check the lock release current plus 0.5A for the system does not exceed the power supply rating. 5. Lock release jammed due to over tight fitting; check there is some 'play' between the lock and lock release. Do not fit the tongue on the door to deep.
Lock release operates all the time. WARNING: Not all lock releases are continuously rated; this may cause it to burn out.	1. Short on the lock button cable core going to Z on the phones. Probably to power supply common (Terminal H or O). 2. Lock release button stuck in or faulty. Disconnect Z terminal from the phone in question and see if the fault disappears.
Trades button doesn't work (where fitted)	1. No power to the Time Clock, check the time clock can be forced on. 2. Time clock settings not working, force the time clock on to check. Note the TS2000(-BST) time clocks need to see the time change to operate. 3. Time clock not working. Short the CO and N/O terminals together to bypass. 4. Break in the trades button circuit.

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Telephone Ring Problems

Phone doesn't ring	1. Broken wire between the call button for that flat and the phone (Terminal I). Try a spare core. 2. Broken wire between the phone (Terminal O) and the speech unit. Check if the lock button or speech work, if either does then the O connection is ok. 3. No voltage getting through to I and O terminals on the phone. Check at least 10V across I and O when the call button is pressed or shorted. 4. Dodgy call button. Short the 2 terminals to prove. 5. Missing connection between C on the speech unit and the call buttons (no phones ring).
Phone ring's but not heard at the entrance	1. Missing 'R' or shorted connection between phone and speech unit. There will also be no speech heard at the entrance.
BS-LX phone flashes red and green periodically instead of ringing	1. No 12V DC to connection 'V', check at least 8V between V and O on the phone when it is ringing (highest current). Also check there is power at the phone by pressing the bell button on the phone and seeing the mute light come on.
Mute LED won't light on a phone. (not all models)	1. No 12V DC on terminal 'V'.
Door open LED does not come on, on the phone (not all models)	1. No 12V DC on terminal 'V' 2. 'L' terminal no shorting to 0V when the door is open. Connect L to O on the phone to check phone.

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Speech Problems

Acoustic feedback: Loud tone/howl at the entrance speaker and phone, whenever the handset is taken off hook. Sometimes this effect is continuous and sometimes it will vary with the position of the handset or appear only whilst talking.	1. Either or both volume controls are adjusted too high. Normally both A and B should be adjusted to between one third and one half of full rotation to achieve good speech volume without feedback. 2. The 'O' connection is not properly made. Mis-connection of the O-line between the speech unit and the telephone will dramatically reduce the feedback threshold. Check your wiring for this fault. If the phone rings or the lock button works this cause is unlikely (they also use the O). 3. There is an air gap between the speech unit and the grill. The speech unit must be placed firmly against the rear of the grill of the entrance panel; if necessary use packing materials to achieve this. 4. The Entrance Panel and Telephone are located too closely together. If the caller can be heard directly (i.e. without the use of the entry phone system) then the units are too close! 5. The environment is too noisy. If the entrance panel is placed in a noisy environment such as on a busy high street, it may be difficult to obtain satisfactory volume levels. Try sacrificing the volume in one direction to the benefit of the other. 6. The entrance panel is placed in an 'acoustic well'. If the entrance panel is surrounded by reflecting walls e.g. a basement flat then acoustic feedback may occur at lower volume levels. Try changing the position or orientation of the panel. 7. Twisted-pair cable has not been used. The maximum volume achievable can be reduced with other types of cable, especially when the amount of cable or length of runs become significant.

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Low volume speech in one or both directions	1. Adjust pot on 51/61 speech unit marked A (with a speaker symbol) for volume at the panel. 2. Adjust pot on 51/61 speech unit marked B (with a microphone symbol) for volume at the phone. 3. If volume cannot be increased in one direction without feedback, the volume in the other direction may have to be reduced as a compromise. 4. Check model 51/61 is hard against the panel with no gaps. 5. Check model 51/61 speech unit is the right way round 6. If using a 61 speech unit check the microphone single hole lines up with the hole in the panel. 7. Another phone (801, 801S and phones without privacy of speech) is off-hook. To check either go round each phone or: Power the system down, disconnect cores O and T from the speech unit and measure the resistance between those 2 cores. A high resistance (KOhms) means all are on hook. A resistance of Approx. 60R or less indicates a phone off-hook, or a partial cable short for 1 direction of speech.
1 Way speech / No speech from phone to entrance	1. Missing or shorted 'R' connection
1 Way speech / No speech from entrance to phone	1. Missing or shorted 'T' connection
Low frequency hum heard (50Hz) NOTE: There will always be a faint hiss/hum at the speech unit, but you should have to put your ear up to it to hear it.	1. Cores R and O are not in the same pair. 2. Twisted-pair cable has not been used. 3. There is a mains cable running next to the door entry cable.