

AutoBleep Remote SMS Controller Technical Information

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Technical Information

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Connecting up the AutoBleep ABNs

The ABN remote SMS controllers should be mounted in a cool dry place and should be protected from rain or direct sunlight.

The controllers may be mounted to a smooth surface by means of screws through the holes in the corners. Take care not to overtighten the screws.

Connecting the ABN to a Cellphone

If you are using the ABN-8+ or ABN-1+ (which has an integral GSM module), check out the "[Setting up the ABN-8+ and ABN-1+](#)".

The AutoBleep ABN controllers utilise the Nokia 5110/5130/5190/6110/6130/6150/6190 series of cellphones for communication. Since the Nokia 5110 is the least expensive (and no fancy features are required), this model is highly recommended.

The cellphone should be fitted with an appropriate SIM card and should be set up with the proper message centre number. Note that these Nokia phones permit up to three message centre numbers. The Autobleep ABNs utilise only message centre *one*.

Test the cellphone to ensure that it is able to both send and receive SMS messages. In particular, it is important to check that the cellphone will receive a suitable signal in the place in which it is to be mounted. It may be necessary to use an external antenna in poor reception areas.

Connect the cellphone to the ABN with the provided cable.

Connecting a Power Supply

Connect a 12 volt DC power supply to either the power jack or the 12V screw terminals on the ABN. Use a common mains adapter if your application does not require uninterrupted power. If you connect the ABN to a battery supply such as a vehicle's battery or the backup battery of an alarm system, it is highly recommended that an inline fuse be installed on the positive wire to eliminate the risk of fire or damage in the event of a short circuit.

A suitable charger may be permanently left connected to the cellphone. The cellphone may be mounted nearby using a strip of sticky-back Velcro or other suitable material. Note that the supplied cable should not be extended. Rather use a commercially available external antenna if the cellphone and controller are to be mounted in a metal cabinet or other environment which may impinge upon cellphone reception.

Upon applying power to the ABN, the 'Status' LED will initially flash rapidly (3 or 4 flashes per second) and will then flash once per second and the cellphone will display the message 'Accessory connected'. If the status LED continues to flash rapidly, there is some problem and you should check out the "[Troubleshooting](#)" section.

Test the unit's outputs by sending an SMS message from another cellphone. The message 'AY' should cause LED A to light up and a click from the relay should be audible. The message 'AN' should turn LED A off again. Note that there will be a delay of approximately 8 seconds from sending the message before the output is switched on or off. This is the normal delay in sending and receiving SMS. The other outputs (on the ABN-8) may be tested by sending the messages 'BY' and 'BN' to test output B and 'CY' and 'CN' to test output C and so on.

The momentary activation of the outputs may be tested by sending the message 'AM' which should cause LED A to turn on for 1 second and then turn off again. The messages 'BM', 'CM' and 'DM' will do the same for outputs B, C and D on the ABN-8.

Testing the inputs requires that the inputs be programmed first. This is done by sending a message in a form similar to the following to the unit. Of course, you should substitute your own telephone number in place of the example below:-

```
JTESTING INPUT J+27835550000
```

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The other inputs on the ABN-8 can also be programmed at this time by sending the following example messages:-

```
KTESTING INPUT K+27835550000
LTESTING INPUT L+27835550000
MTESTING INPUT M+27835550000
NTESTING INPUT N+27835550000
```

and so on.

A breakdown of the first command above is:-

J – input J

TESTING INPUT J – the message that should be sent when input J is activated. Note that the message should not contain any '+', " characters.

+27 – country code (in this case South Africa)

83 – provider code (in this case MTN)

5550000 – cellphone number

Note also that the full phone number should be entered, including the initial '+', the country code and provider code.

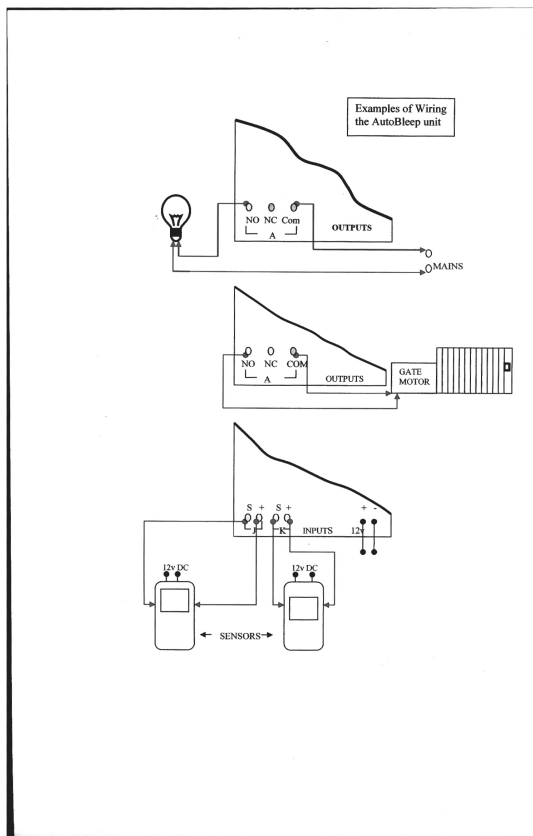
To test the inputs, connect a wire (perhaps through a pushbutton switch) between the '+' and 'S' terminals on input 'J'. Connecting the input momentarily (not less than 0.5 second) will cause LED J to light up. Within a few seconds, you should receive the SMS message 'TESTING INPUT J' on your cellphone.

The other inputs on the ABN-8 may be tested in a similar manner.

If these tests were satisfactory, you are now ready to connect the ABN to your external devices.

Take note that on the input terminals, the '+' terminal is simply connected to the +12V power rail. The 'S' terminal is the 'sense' input, and as such is the actual input terminal.

Connecting the ABN to the Real World



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Outputs

Both normally–open and normally–closed contacts are provided on the relay outputs. In most instances, an output's common (Com) and normally–open (NO) screw terminals will be connected in series with a load.

Although the relay contacts are rated at 10 amps at 220 volts, care should be taken to stay well within this rating, particularly with large inductive loads such as electric motors which may well draw way in excess of their rated current at startup time.

In such an instance it is recommended that the output contacts drive an external heavy–duty relay which in turn drives the load. This will ensure that the ABN is not either damaged, or suffers premature failure of the output contacts.

Inputs

Applying a voltage of between 5 and 18 volts to any of the input 'S' terminals will cause that input to activate. Where the source of the input voltage is separate from the 12V supply to the ABN, it will be necessary to also connect the '–12V' terminal to the ground of the device providing the signal.

In most applications, such as an alarm system, it is sufficient to use the '+' terminal on the input to provide the voltage to activate the input.

Note that the terminals marked '+' on each input are simply connected to the +12V supply rail through a protection diode. Take care not to short the '+' terminals to ground!

Lightning Considerations

Although the ABN controllers provide a better than 5000 volt isolation on both the inputs and the outputs, care should be taken when connecting long wires (particularly outdoors!) to either the inputs or outputs.

Where very long wires are connected to either inputs or outputs, it is recommended that commercially available lightning protection devices are used to prevent destruction of the ABN and/or any associated equipment in the event of a nearby lightning strike.

Programming the ABNs

Due to the inconvenience of entering long text strings on the diminutive keypad of most cellphones, the instructions which need to be sent to the ABNs have been kept deliberately concise.

In addition, since most cellphones make it easier to send SMS messages containing alphabetic characters (rather than numerics), the command set consists largely of alpha characters.

All programming of the ABN is done by sending SMS messages to the cellphone connected to the ABN. Bear in mind that, since it is possible to send SMS messages to oneself, the ABN can be programmed using only its attached cellphone.

A feature allows programming to be done using an ordinary PC. This requires an optional serial data cable which plugs into the header connector at the top of the ABN. For more information about the serial interface feature, see the section "[Connecting the ABN to a PC](#)".

Programming the Outputs

Sending commands to activate the relay outputs on the ABN is extremely simple. An SMS message is sent to the ABN:

A letter representing which output is to be activated (only 'A' on the ABN–1 and 'A' through 'H' on the ABN–8).

Then either a 'Y', an 'N', an 'M' or a 'T' follows this where:

'Y' – means turn the output on,

'N' – means turn the output off, and,

'M' – means momentarily switch the output on and then off again for 1 second.

'T' – means toggle the output – i.e. if the output is off, turn it on, or, if the output is on, turn it off.

So, sending the following message:

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AY

will turn on output A, and:

AN

will turn A off again. If you wish to activate the output momentarily, such as is usually the requirement for opening automatic gates or doors, the following message should be sent:

AM

which will cause output A to turn on for 1 second and then turn off again.

Another option is the "toggle" option where:

AT

will turn output A on if it is currently off, or, turn A off if it is currently on.

Several output commands may be combined in a single message. For example:

AMBNCY

will result in output A being momentarily switched on and then off, output B will be switched off, and output C will be switched on.

There are additional timed functions for setting outputs. Check out "[Getting clever with outputs](#)" for more information.

Programming the Outputs for Voice Calls

The ABNs have a feature which is useful for access control applications whereby outputs may be activated simply by making an ordinary voice call to the ABN.

This feature utilises the Caller Line Identification (CLI) feature of GSM to identify the caller and activate an output without actually answering the call. For example, if the ABN is programmed with the following message:

VAM5551111

output 'A' will be activated momentarily upon receiving a voice call from caller '5551111'. Note that only the *last* portion of the caller's telephone number needs to be entered. This may be useful where, for example, the ABN is used for controlling access to an office parking lot and needs to be programmed to recognise the phone numbers of many callers.

Using only the last several digits of the phone number is recommended because different phones and networks may identify themselves either by sending the full international number (i.e. including the +27 prefix), or else just prefixing the provider code with a '0'. In order to avoid any confusion which may result from this, it is best to use only the last seven or eight digits of the number.

The format of the above voice call command is:

'V' – indicates that this is a voice call command;

'AM' – indicates that output 'A' should be activated momentarily. The format of this portion of the command is identical to the usual SMS output programming commands.

'5551111' – is in this instance the last seven digits of the phone number which is to be recognised.

In the event that it is necessary to delete this entry from the ABN's internal database, the following command:

VX5551111

will remove the voice caller entry for the caller whose number ends in '5551111'. Please note that if, as in this instance, the last *seven digits* of the caller's number were used in creating this entry, the same *seven digits* should be used in deleting the entry.

Note that it is possible to program more than one voice call command for *the same* phone number. For example:

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VAM5551111

and

VBM5551111

will trigger both outputs A and B on a single phone call from 5551111.

It is also possible to program the ABN to answer selected voice calls so that the caller can listen in to all activities in the vicinity of the ABN. Check out "[Snooping with the ABN](#)" for more information.

Programming the Inputs

Programming the inputs is a little more complicated, since it is necessary to tell the ABN to whom a message should be sent when a particular input is activated, as well as what the content of the message should be. Inputs are labeled 'J' through 'Q' ('J' only on the ABN-1).

Sending the following message to the ABN tells it to send the SMS message 'INTRUDER DETECTED IN LIVING ROOM' to phone number 27835550000 if input J is triggered:

```
JINTRUDER DETECTED IN LIVING ROOM+27835550000
```

Note that the full telephone number (including country code) should be entered including the leading plus sign.

The ABNs can send the same message to several different cellphones by giving it the following instruction:

```
KMOTHER IN LAW PRESSED PANIC BUTTON!+27835550000+27835551111+27835552222
```

Note that the message is sent to all three numbers if input 'K' is triggered.

The programming for a particular input may be deleted by sending an SMS command such as:

```
JX
```

This will delete any configuration for input 'J', and therefore any subsequent activation of input 'J' will produce no response from the ABN.

A further feature which may be useful for some applications permits the user to program the ABN to send a message when an input goes from an ON to an OFF condition, rather than the usual OFF to ON transition.

This is implemented simply by sending an instruction where the input is represented by its lower-case letter. The following example demonstrates an application where input J is used to monitor mains power:

```
jMAINS POWER WENT OFF+27835550000  
jMAINS POWER WENT ON+27835550000
```

This feature may also be utilised with alarm devices which are normally on, and go 'off' when they are triggered. The following would work well where, for example, the normally-closed contacts on an alarm detector were connected via input K:

```
kALARM IN OUTHOUSE ACTIVATED!+27835550000
```

Low Battery Detection

The ABNs have built-in low battery detection circuitry which can be programmed by the user in the same way as the other inputs.

The name of the low battery input is '.' (dot, period). So if the following programming command is sent to the ABN:

```
.BATTERY LOW+27835550000
```

the ABN will send the message 'BATTERY LOW' if the supply voltage drops below approximately 10.5 volts.

Enabling and Disabling the Inputs

It may often be useful to disable certain inputs, particularly in security-type applications. For example if alarm sensors have been connected to inputs and those inputs have been programmed to send messages if those sensors have been triggered, it would be useful to be able to disarm the alarm system. This may be done by sending the ABN the following message:

IN

This command will disable all of the inputs until the message:

IY

is sent to the ABN, which will enable all of the inputs again. What this means is that, although the inputs are programmed to send messages, they will not do so while they are disabled. When the 'IY' is sent, they will send messages again if they are triggered.

It is also possible to split enabled/disabled inputs into two 'zones'. If the message:

I1

is sent, this will *enable* inputs J, K and L and *disable* inputs M, N and O. P and Q will always remain enabled. Sending the message:

I2

will *disable* inputs J, K and L and *enable* M, N and O. P and Q will still always be enabled.

IT

will 'toggle' the inputs. This means that if the inputs are all enabled, 'IT' will disable them all. If the inputs are all disabled, 'IT' will enable them all. 'IT' will similarly flip an enabled zone off and a disabled zone on. Inputs P and Q are not affected by this command, since they always remain enabled.

So, in where the ABN is used as an alarm system, it would be possible to arm the sensors in one area, while leaving them disarmed in another.

Inputs P and Q can be considered to be a "24-hour zone", as they always stay enabled and may be used as panic-button circuits or could also be used for a keyswitch or remote for enabling/disabling inputs or other functions.

If you really want to be able to disable inputs P and Q, the command:

I0

will disable *all* inputs, including P and Q.

In alarm applications, a problem can occur if an alarm sensor is repeatedly triggered, resulting in a flood of SMS messages being sent. This can be dealt with by using "input delays". For more information on this feature, check out ["Using input delays"](#).

Inputs may be programmed to do almost anything if triggered, including executing any ABN command. To see how to do this, check out the section ["Getting clever with inputs"](#).

Input/Output and General Status Monitoring

This feature allows a remote user to establish if the inputs and outputs are either on or off, without the need to program the ABN to send immediate SMS messages when an input is activated. This may be used for applications where the inputs and/or outputs need to be monitored on an *ad hoc* basis.

Simply sending the ABN the following message:

S

will cause the ABN to respond with an SMS message in the form:

```
aBcdeFgh
jKlmnOpq
ZONES=ALL (JKLMNOPQ)
CNTRY=655
PRVDR=10
```

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```
CELLID=3AB6  
CELLBR=Greenhills  
SIGNAL=4/4  
TIME=13:45  
DATE=15/07/05  
VER=3.2
```

This response indicates that the inputs and outputs represented by a lower-case letter are off, and those indicated by an upper-case letter are on. So, in the above example, outputs A, C, D, E, G and H are off, while outputs B and F are on; inputs J, L, M, N, P and Q are off, while inputs K and O are on.

ZONES=ALL (JKLMNOPQ) indicates which inputs are currently enabled. In this instance all inputs (J-Q) are enabled. The 'I' command, which permits 'zones' of inputs to be enabled/disabled will cause this field to change.

The remaining information gives details of the location of the ABN. CNTRY=655 tells us the country code (655 means South Africa), PRVDR=10 tells us the service provider code (10 is MTN), and CELLID=3AB6 indicates the cell ID of the cell in which the ABN is currently located.

CELLBR=Greenhills is the 'cell broadcast' of the cell in which the ABN is located. This information varies depending on the network provider. For example, in South Africa all networks broadcast the place name, whereas in the United Kingdom the (landline) telephone area code is broadcast.

The location information may be useful for tracking vehicles or goods. Details of country and provider codes may be found [here](#). Details on the codes and locations of cell IDs and broadcasts may be obtained from your service provider.

SIGNAL=4/4 indicates the signal level of the phone attached to the ABN. 4/4 or "four over four" indicates "four bars" or good signal strength, whereas 0/4 means that there is little or no signal.

TIME=13:45 indicates the time which is set on the cellphone connected the ABN. Try to ensure that this has been set correctly!

DATE=15/01/05 is the date that has been set on the phone. Note that on a Nokia 5110, it is possible to set the date on the phone – even though the phone has no calendar! To set the date and time on a 5110 or set it remotely on whatever phone you have connected to the ABN, see the section "[Setting the time and date](#)".

VER=3.2 indicates the firmware version in your ABN. When making technical enquiries, it is often useful to quote the version number.

Normally the ABN will send this status message back to the cellphone that requested it. However, the 'S' command may be invoked by a 'when' command or when an input is triggered. In this case, the ABN would actually send the status message to the last cellphone it received a message from.

This may not be what the user wants, so it is possible to specify which cellphone the status message should be sent to. This is done as follows:

```
S+27835557777
```

This form of the 'S' command will ensure that the status information is sent to phone number 27835557777.

More Advanced Programming Features

Multiple Commands per Message

Multiple commands can be sent to the ABN in a single SMS message. This done by separating the commands with a semicolon (;) or carriage return character (only some phones allow this – usually the "enter" key).

For example:

```
AY; IN; S
```

when sent as one message, will turn 'A' on, disable inputs and request a status response.

Logging

The ABN-8 and ABN-1 (as well as the ABN-8+ and ABN-1+) have much larger storage memory which permits logging of all events. More information on this feature of the -8 and -1 may be found in the section "[Logging on the ABN-8 and -1](#)".

Uploading Stored Information

Many instructions to the ABN are kept in non-volatile storage memory on the ABN. These commands would include the input programming commands (J – Q and j – q), voice call commands (V) and 'when' commands (W). Logging information is also kept in this storage memory. By sending the command:

U

all stored commands will be sent back to you in one or more SMS messages, depending on the amount of information which is stored.

If the 'U' command is followed by another single letter, only certain information can be selected. For example, if:

UJ

is sent to the ABN, it will send back what is programmed into input J. So it actually 'uploads' all commands which start with a 'J'. Another example:

UV

will send back all the 'voice call' commands, or all commands which start with a 'V'.

Timed Operations

The ABNs have a very useful facility whereby any operation may be performed at a set time. This is performed by means of the 'W' or 'when' command.

For example, you may have connected output C to your outdoor lights, and you would like to have them turned on automatically at 6pm and then turned off again at 11pm. The 'W' command is followed by 4 digits which indicate the time on a 24-hour clock, and this in turn is followed by any other ABN command.

W1800CY

will cause output C to be turned on at 6pm every day, and

W2300CN

will cause output C to be turned off at 11pm every day.

Another example may be where you may wish to allow a person with the phone number 5559999 to enter an automatic gate by means of a voice call, but only between the hours of 8am and 5pm. Assuming your gate is connected to output D, you could do this by sending the following:

W0800VDM5559999

and

W1700VX5559999

This would have the effect of adding the entry 'VDM5559999' every morning at 8, thus permitting voice caller 5559999 to open the gate from that time onwards, and 'VX5559999' would then delete that entry every afternoon at 5. Therefore our caller would effectively be denied access between the hours of 5pm and 8am.

An even more elaborate example may be where your alarm should alert different persons if it is triggered at different times of the day. Assuming the alarm is connected to input L:

W0800LALARM AT FACTORY+27831112222

W2000LALARM AT FACTORY+27824445555

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would cause the holder of phone 27831112222 to receive alarm notifications between 8am and 8pm, while the holder of phone 27824445555 will receive alarm notifications between 8pm and 8am.

Often one may wish to receive a 'heartbeat' message at regular times to ensure that everything is working correctly. This can be done with:

```
W1900S+27835557777
```

This will send a 'status' message to 27835557777 at 7pm every day.

Should you wish to remove a 'when' command, the format would be something like this:

```
WX0830
```

This will delete ALL 'when' commands that execute at 8.30am. So, if you have several things that happen automatically at 8.30am, they will all be deleted.

Take note that the 'when' command utilises the clock on the cellphone which is connected to the ABN. So make sure that the time on that phone is correctly set!

The 'when' command also has a 'wildcard' facility which works something like this; if any digit of the time is replaced with an asterisk (*), it means 'any' minute or second. So if we were to send a command like:

```
W**00AY
```

output A will be turned on every hour, on the hour, and:

```
W**05AN
```

output A will be turned off every hour, at 5 minutes past the hour. So output A will be turned on for 5 minutes every hour. Another example:

```
W06*0BT
```

will toggle output B on and off every 10 minutes between 6am and 7am. So B will turn on at 6:00am, turn off at 6:10am, turn on at 6:20am, turn off at 6:30am and so on until 7am.

Setting the Momentary Activation Period

The default period for momentary activation of outputs is 1 second. For example, the command 'AM' will cause output A to turn on for 1 second, and then turn off again. If you want to change this to a longer period, the 'Tn' command will allow you to change the activation period ('n') to any value from 1 to 9 seconds. For example:

```
T5
```

will set the momentary activation period to 5 seconds for all future momentary commands.

Security Mode

Setting this feature will cause the ABN to accept future command messages *only* from the callers for whom security modes have been set.

There are two levels of security which may be set for individual callers: high and low. The ABN initially will accept commands from any caller, but as soon as security mode has been set for any single caller, the ABN will refuse commands from any other caller, unless security mode is then set for that caller too.

High level security will permit the caller for whom it has been set to issue any command to the ABN; low level security will only permit a caller to issue output activation commands (A-H) or to request input/output status (S).

High level security is set as per the following example:

```
XH5551111
```

The breakdown of this command is as follows:

X – Set security;

H – High level security for this caller;

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5551111 – The last several digits of the caller's phone number.

Note that it is not necessary to enter the caller's full phone number, but it is of course recommended that since this is a security-related issue, at least the last 7 or so digits should be used.

It is strongly recommended that at least two caller numbers be entered and tested when setting up the ABN. Otherwise nobody will be able to program the ABN if the only caller's cellphone is lost! Be careful when setting up this feature, otherwise you may lock yourself out!

Low level security may be set as follows:

XL5552222

This will permit the caller whose last seven digits are 5552222 to issue commands to activate outputs and query input/output status only. This caller will not be allowed to program inputs, voice calls, set security levels or clear all settings.

The entry for a secure caller may be deleted by sending the ABN a message similar to the following:

XX5552222

This will delete any security entry for the caller with the number 5552222. Note that, although it is only necessary to enter the last several digits of the caller's number when *setting* security levels, the *same* number of digits *must* be entered when deleting that caller's entry.

Clearing All Settings

By sending the command message:

Z

all settings in the ABN are cleared and returned to factory defaults.

Error Messages

When a command is normally sent to an ABN, it will perform the command and no further response is returned to the sender of the command. However, if the ABN is unable to fathom the meaning of the message sent to it, it will send back an SMS message, usually something like: "AutoBleep: Command not understood."

Where the user wishes to have confirmation that a command message has indeed been received and actioned by the ABN, the following command must first be sent to the ABN:

RY

Thereafter, this will ensure that a response is sent back to the sender of *every* message sent to the ABN, either confirming that a command has been actioned or else complaining of some error.

If no responses are required from the ABN at all (errors or otherwise), the message:

RN

will ensure that thereafter no error or confirmation messages are sent back to the sender. Where it is desired to set the ABN back to its default behaviour, where only error responses are returned, send it the following command:

RE

Setting up the ABN-8+ and ABN-1+

The ABN-8+ and -1+ have an integral 900MHz GSM module and there a number of considerations to be taken into account when setting up these units.

Before you do anything else...

It is necessary to obtain a SIM card which will be inserted into the ABN unit. Before doing this, however, it will be necessary to set up a few items and to verify the functionality of the SIM. For this you will need another cellular handset. Insert the SIM card in your cellphone and power it up.

Disable PIN request

If the SIM card requests a PIN number, you will have to disable this, since the ABN does not know what your PIN number is. Enter your PIN and go to the menu on your phone (usually something like 'Security Settings') and disable the PIN request option. When you have done this, switch the phone off and back on again. If you have done this correctly, the phone will not ask for the PIN again.

Set the message centre number

Most SIM cards come from your network provider with the message centre number already set. However, it is worth checking this, since the ABN will not be able to complain if it cannot send you an SMS message! The message centre number should be set as message centre 1, in the case where you are able to set several message centre numbers. If you do not know what the message centre number should be, it can be obtained from your network provider.

Verify SMS functionality

It is now a good idea to check that your phone is functional in all respects, particularly as to SMS messaging. If you intend using the voice call functions of the ABN, make sure you can make and receive a call. Then test if you can send and receive SMS messages. Should you encounter any difficulties, these can be sorted out with your network provider. Most problems in this area usually relate to the network provider having failed to activate either the SIM card or options such as SMS. In this regard, it is also important to verify that CLI (Caller Line Identification) is functional.

Insert the SIM card in the ABN

Once you are satisfied that the SIM is set up and fully functional, insert the SIM card into the holder in the back of the ABN unit. You can now apply power to the ABN and verify its functionality as set out in the "Technical Information" section.

Getting clever with inputs

An input can be programmed to do much more than just send an SMS message to someone. The input can be programmed to execute any ABN command and thereby manipulate outputs, set timers, send status information and so on.

An example

As an example, let us assume that in a simple alarm application we have connected a sensor to input 'J', and a siren to output 'A'.

What we want to have happen if the sensor is triggered, is firstly a message is sent to the holder of phone number 27835556666 and secondly, the siren is turned on for 5 minutes.

All that is required to do this is to send one message to the ABN which sets all of this up. The message looks like this:

```
J<A6>ALARM+27835556666
```

Note that this is just the same as any ordinary programming of an input, with the exception of the mysterious '<A6>'. If 'J' is triggered, it will send the message 'ALARM' to 27835556666.

However, anything that is between 'less than' (<) and 'greater than' (>) signs will be considered to be commands and will not be sent as part of the message.

The 'A6' command (see "[Getting clever with outputs](#)") tells the ABN to switch output 'A' on for 5 minutes and then switch it off again.

Getting cleverer

Let's say we also want to open the gate to the rottweiler cage when the sensor is triggered. The gate motor for the rottweiler cage is connected to output 'B'.

We now reprogram input 'J' with:

```
J<A6><BM>ALARM+27835556666
```

Now, when our unfortunate intruder triggers the sensor, the siren will sound for 5 minutes, the momentary activation of 'B' releases the slavering pack of rottweilers and you are notified by SMS.

Getting elaborate

Normally you have your ABN programmed so that a voice call from your phone turns on the hot tub so you can be sure it is warm and bubbly when you get home from a hard day at the office.

Of course, burglars only break into your house when you are away on holiday in Bermuda, so the following will at least give you a chance to find out more about what is happening at home when you get an 'ALARM' message:

```
J<A6><BM><VX5556666><VLI5556666>ALARM+27835556666
```

'VX5556666' will delete any previous voice call commands for your phone (you don't need the hot tub when you are away on holiday). 'VLI5556666' tells the ABN to answer the call if you phone it: see [Snooping with the ABN](#).

Now, if the alarm is triggered, you will know about it and you can phone your ABN and listen if your rottweilers are doing a good job.

Getting clever with outputs

In addition to the 'momentary' function for controlling ABN outputs, more extensive timed functions are possible. These could be useful for, for example, turning lights on and then have them turn off again after a few minutes.

Another example may be where an output is connected to a siren which, if triggered, should automatically turn off after 2 minutes. In this case, it is also possible to trigger that output when an input is activated. To see how this is done, see the section "[Getting clever with inputs](#)"

In the first example above let us say that we want to turn a light on for 5 minutes, after which it will turn off again. Assuming that the light is connected to output 'B', we would send the ABN the following:

B6

The digit '6' (as opposed to the usual 'Y', 'N', 'M' or 'T' commands) means 'turn on for 300 seconds (5 minutes)'. The following table shows what periods digits '1' through '9' mean:

Digit	Seconds	Minutes
0	beep-beep	-
1	5	-
2	10	-
3	30	-
4	60	1
5	120	2
6	300	5
7	600	10
8	900	15
9	1800	30

These times can be combined to get very specific periods. For example, if it is desired that output 'A' be turned on for 3 minutes, the following will do the trick:

A4A5

'A4' turns on for 1 minute and 'A5' turns on for 2 minutes. These two times are effectively added together to give 3 minutes.

This could also be used to turn an output on for very long periods. The following:

B9B9B9B9B9B9

would turn output 'B' on for 3 hours. This could be done up to a theoretical limit of around 18 days.

Note that:

A0

will cause output 'A' to pulse rapidly twice. This is useful if this output is connected to buzzer or horn and you wish to have it make a quick "beep-beep" sound. This is often used to indicate whether an alarm is armed/disarmed.

Applications

The ABN series of remote SMS controllers may be used for a wide range of applications. This page will show you how to apply the ABNs for some more common practical uses.

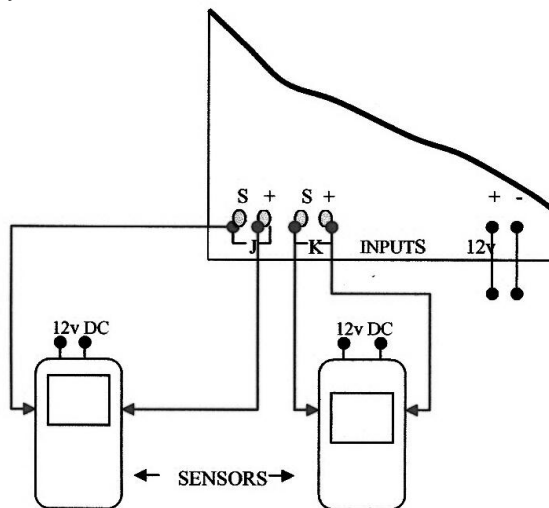
A Simple Intruder Alarm System

Most common intruder alarm systems simply set off a siren or electronic noisemaker when an intruder is detected. The deterrent value of such a system is very limited, since most persons within hearing range simply assume that it was a false alarm or just don't really want to get involved.

Unfortunately most burglars know this.

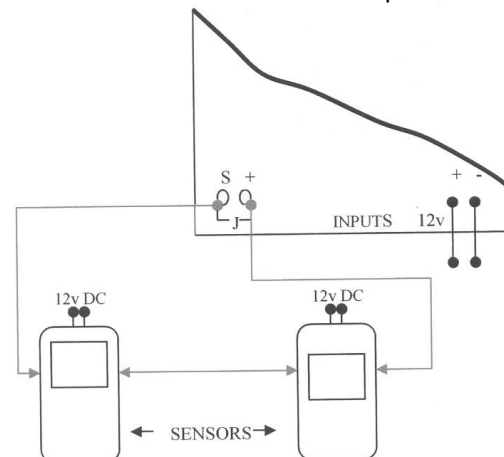
An alarm system that notifies people who have an interest in the property being purloined, however, will lead to a response which is more likely to prevent a theft from being carried out and perhaps even lead to the apprehension of the perpetrators.

This example demonstrates how the ABN controller may be used in conjunction with a few commonly available passive infrared detectors to provide an effective security solution for the home, office or factory.



The ABN-1, with its single input and single output would be adequate for many instances, and the ABN-8 (with 8 inputs and outputs) would permit a more sophisticated system.

The circuit below shows several passive IR detectors connected in series. These devices usually have normally-closed contacts so that if an intruder cut a wire, the alarm would be activated. Connecting the detectors to one or more inputs would therefore cause those inputs to be ON all of



the time, except when a detector is triggered.

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If the ABN is programmed with a message such as: jINTRUDER DETECTED+27835551111 then the message 'INTRUDER DETECTED' will be sent when input J goes from an ON to an OFF condition; i.e. when a detector is triggered.

Of course, using the ABN-8, many additional features could be added, such as sensors on different inputs allowing you to be informed of the precise whereabouts of the intruder, and outputs allowing you to open the gate releasing the rottweilers, arming the booby-traps, setting off the siren and releasing the mustard gas.

All of this control can be exercised irrespective of whether you are in Cape Town or Oslo.

A Vehicle Alarm System

Since the ABN controllers require a 12 volt DC power supply, they can be easily applied to help protect an automobile or truck from theft.

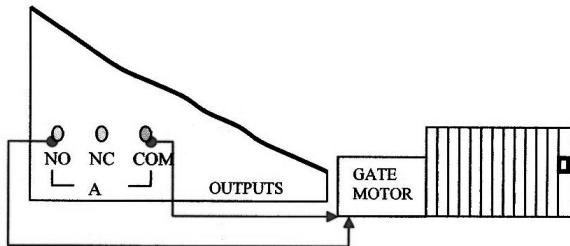
Inputs may be used to notify you of a theft of your car in progress. Outputs may be used to immobilise the car and to flash the lights, blow the horn and otherwise attract attention.

In addition, if the vehicle indeed stolen, the ABN can be sent a request to disclose the cell ID in which the vehicle is currently located, thereby greatly assisting in its recovery.

Access Control Systems

The feature of the ABNs which allows output A to be activated by simply making an (unanswered) voice call to the ABN provides a wide range of opportunities to control access to your home, office, or factory. The ABN may be programmed (via remote SMS messages) to activate output A *only* if it receives a voice call from a cellphone which is in a list of numbers maintained in the ABN. The ABN does this by utilising the Caller Identification feature of GSM.

For example, the ABN's output A could be connected to the automatic gate or boom which controls access to an office parking lot. The supervisor of the lot could add or delete valid cellphone numbers on the ABN without leaving the comfort of his office simply by sending SMS messages to it.



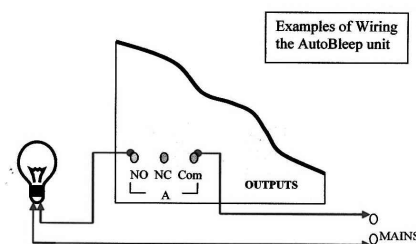
Employees and/or other people who are entitled to enter the parking lot would then be able to open the gate or boom simply by speed-dialling the ABN's number.

This access scheme obviates the need and cost of distributing access cards or remotes, which frequently get lost or left at home.

The ABN range of remote SMS controllers can be integrated with almost any access control system to add this useful feature.

Controlling Appliances

Almost any electrical appliance can be switched on or off remotely as seen in the example below.



Setting the time and date

It is important that the time is set correctly on the ABN (or more correctly, on the cellphone connected to the ABN) if the timed 'when' command is to function properly.

It is also important for the date to be set, since the logging feature requires a correct date.

Normally the time and date can simply be set on the phone handset, but this is not possible on the ABN-8+ and ABN-1+, since these units have an integral GSM module.

Where a Nokia 5110 (which does not have a facility for setting the date and does not have a calendar function) is connected to the ABN, the following commands will set the date correctly in the 5110. Thereafter, the 5110 does indeed maintain the calendar date correctly.

Setting the time

The format of the command to set the time is '#hh:mm'. So sending the ABN the message:

```
#17:15
```

will set the time on the phone (or integral phone module) to 5:15pm.

Setting both time and date

To set both the time and the date, the format is '#hh:mm dd/mm/yyyy'. So, sending the message:

```
#17:15 15/01/2005
```

will set the time to 5:15pm on 15 January 2005. Note that this format is inflexible. The hour, minutes, day and month *must* each be two digits. The year *must* be four digits. There *must* be colons, spaces and slashes in the positions shown in the examples above.

Checking if the date and time are correctly set

Sending the ABN a simple 'S' status command will cause it to send back a message which (among other things) will tell you what the date and time is currently set to. The 'S' command is dealt with in more detail in the "[Technical Information](#)" section.

Note that the 'S' command returns the year portion of the date as only *two* digits, whereas when setting the date, *four* digits must be specified for the year.

Using input delays

In many applications, particularly alarms, the situation may occur that when an alarm sensor is triggered repeatedly, a message is sent by the ABN each time it is triggered.

For example, if an infrared detector is connected to one of the inputs, that input will send a message each time the intruder moves. This will result in a message being sent every few seconds – which is not only annoying, but also unnecessary and expensive!

To deal with this problem, the ABNs have a feature known as 'input delays'. Normally, an input needs to be activated for about 0.5 second to trigger it. Once it has been triggered, it is immediately ready to be triggered again.

Setting input delays allows the user to set a period of time for which the input will be temporarily disabled after having been triggered. Setting such a delay is easy. If, for example, we do not want input 'K' to respond again for at least 1 minute after it has been triggered, we can send the following message to the ABN:

K4

'K', of course, refers to input 'K', and '4' means 60 seconds (or 1 minute; see the table below for times).

The effect of this is that if input 'K' is triggered, it will send a message, but if it is triggered again, it will not until a period of 1 minute has elapsed, after which it will again send a message if it is triggered.

Once an input delay command as in the example above has been sent, it is stored permanently in the ABN until it is changed again. To remove the input delay from input 'K', send the following message:

K0

The following table shows the delay periods which are available:

Digit	Seconds	Minutes
0	0	–
1	5	–
2	10	–
3	30	–
4	60	1
5	120	2
6	300	5
7	600	10
8	900	15
9	1800	30

Logging on the ABNs

The ABNs currently have a feature (experimental) which permits activities to be logged for specified ports.

Logging may be enabled on, for example, input 'A' by sending an SMS to the ABN as follows:–

!AY

Logging may be turned off by sending:–

!AN

To turn on logging for input 'J', you would send:–

!JY

and so on.

Turning logging on will cause the ABN to store each event which occurs on that particular input or output. The data is stored in the ABN's internal EEPROM as a comma-separated field which begins with an exclamation mark (!).

The logged data can be uploaded to your cellphone by using the 'U' command. Sending the ABN the following message:–

U!

will upload all logged information.

It should be noted that there is only 32K bytes of EEPROM storage in the ABN and frequent events will fill EEPROM rapidly. As of the current firmware release (Version 3.2), it is the user's responsibility to ensure that EEPROM is not overflowed.

In order to upload *and delete* logged information, send the following:–

U!X

Connecting the ABN to a PC

Using the optional serial interface cable, the ABNs can be connected to a computer system in order to control all of the AutoBleep functions.

This may be useful to either program and control the ABN conveniently using a PC, or else to utilise the functions of the ABN from a computerised control system.

All of the functions of the ABN (plus one or two extras) are available via the serial port. No additional software is required other than a simple terminal emulator.

How to set it up

If you are using Microsoft Windows 95/98/NT/2000/XP, simply plug the serial interface cable into one of your COM ports. The other end of the cable plugs into the header connector at the top of the ABN.

Microsoft supplies HyperTerminal with all of its operating systems. Ensure that HyperTerminal is indeed installed and run it. When HyperTerminal presents you with its setup options, set it to the COM port you have chosen and set the options to 9600 bps, 8 bits, no parity, one stop bit and no flow control.

If you are using Unix or Linux, the same configuration can be used to set the 'tip' command to communicate with the ABN.

Power up the ABN and the message 'AutoBleep ABN-8 Version 3.2' should appear on the screen after a few moments. It will be followed by a 'greater than' sign (>) prompt.

You can now type in any of the ABN commands which you would normally send by SMS. Whilst interacting with the ABN using the PC, normal operation of the ABN is unaffected.

Additional functions

In addition to the standard ABN commands, the following command is permissible from the PC:

```
)Test message+27835559999
```

This command will simply send the message 'Test message' to phone number 27835559999. Note that the command starts with a 'right parenthesis' character ()). This will permit any equipment connected to the ABN through the special serial cable to send SMS messages via the ABN.

Where the ABN is connected to a PC and the user wishes to send an SMS to the PC from his cellphone (this may be necessary for some control applications), the following:

```
(Hello, PC!
```

will simply result in the string 'Hello, PC!' being written to the serial port. Note that although it is necessary that the SMS message starts with a 'left parenthesis' character, only the text *following* the left parenthesis is written to the serial port.

An additional command which was originally included for debugging purposes, but is sometimes useful is the 'question mark' (?) command. This will do a dump to the screen in both hexadecimal and ASCII of the contents of the ABN's storage memory. No documentation is available to tell you what is going on in there!

Snooping with the ABN

A sneaky feature of all of the ABNs (including the ABN-8+ and -1+, which have a built-in microphone) allows you to set up incoming voice calls from selected callers whereby the caller can listen in to whatever is happening in the ABN's vicinity. Setting this up is very similar to setting up voice calls as described in the ["Technical Information"](#) section. If, for example, the following message were to be sent to the ABN:

```
VLI5553333
```

and a caller whose phone number ends with 5553333 calls the ABN, the ABN will simply answer the call, and the caller can listen to whatever is going on within earshot of the ABN and it's phone. When the caller has heard what he wanted to hear (or perhaps what he did *not* want to hear!), he simply hangs up the call. The command is simply 'VLI' followed by the last several digits of the approved callers' number. This command is kept permanently in the ABN's storage memory, but can be deleted later by sending:

```
VX5553333
```

Unfortunately it is not possible to combine the ordinary voice activation commands (such as to open a gate) for the same phone number with the 'VLI' command, since the ordinary voice activation commands will immediately disconnect the call.

Note, however, that voice call commands can be executed from landline phones as well as cellular phones, provided that the landline service provides Caller Line Identification (CLI).

The ABN can also be instructed to *make* a voice call to a specified number. This may be useful either for 'snooping' or to provide a 'missed call' notification of some event. The format of the command is as follows:

```
VnC0556667777
```

where the digits specify the number to be called and 'n' represents a digit specifying the period after which the ABN should hang up the call. A table setting out these times is as follows:

Digit	Seconds	Minutes
1	5	-
2	10	-
3	30	-
4	60	1
5	120	2
6	300	5
7	600	10
8	900	15
9	1800	30

So, should we wish to have the ABN call someone with the number (082)555-6666 and hang up the call after 10 seconds, the command:

```
V2C0825556666
```

will do the trick. It is also possible to specify the number using the international number format, such as:

```
V2C+27825556666
```

which will do exactly the same as the previous example (at least in South Africa!).

A popular use for this command is to initiate a phone call when an ABN input is triggered. For example:

```
J<V4C0825556666>
```

will cause the ABN to make a voice call to (082)555-6666 if input 'J' is triggered. The ABN will then hang up the call after 60 seconds (that's what the '4' means), whether or not the call is answered.

If that example seems a little strange, check out the section ["Getting clever with inputs"](#).

Another use may be where you want the ABN to make a phone call every hour. This is a great way of annoying you mother-in-law ;-). This example:

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w**00V2C0825556666

will do it for you. Note that the '2' specifies that the call should be hung up after only 10 seconds.

More details about the 'W' or 'when' command used in this example can be found in the section on "Timed operations".

Troubleshooting

The main tool for troubleshooting the ABNs is the 'STATUS' LED on the front panel of the unit. This LED will flash either one to four times per second. This is an indication of the state of the unit and the following describes the meaning of the flashes:–

One flash per second indicates that all is well. The unit is communicating with either the external cellphone or its internal GSM module. The unit is registered with the network and all functions should be active.

Two flashes per second indicates that a voice call is currently active.

Three flashes per second indicates that the unit is unable to register on the GSM network. This could be caused by a number of potential problems. Firstly and most commonly, the PIN request on the SIM card has not been disabled on the ABN–1/8+ units. Secondly it may be that the SIM card has not been properly inserted or is faulty. Check the functionality of the SIM card and (on the '+'-models) make sure it has been inserted correctly. Thirdly, there may be inadequate reception for the phone or GSM module to register on the GSM network. Check for adequate reception or antenna problems.

Four flashes per second indicates that the unit is unable to establish communication with either the external phone or internal GSM module. In the case of the external phone, check that the cable is properly connected and that the contacts are clean. It may be that the cable itself is faulty. The phone or internal GSM module itself may be faulty and require repair.

When the ABN is in the process of sending an SMS message, the status LED will flash rapidly for a few seconds. If it is unable to successfully send the message, it will retry five times before giving up, and during that time the LED will flash for a noticeably longer period. If it is unable to send the message, it is probably due to the SIM having no airtime left! In any event, it will be necessary to check the SIM card functionality in order to establish the reason why the network will not permit the sending of messages.

