# BSC-50E

Autonomous RTU/Data Logger

## Autonomous Intrusion Alarming via SMS

Version: 1.1 – September 2014

### Introduction

An electrician wrote on the Electricians & Electrical Forum, UK:

"*URGENT HELP NEEDED!!*

*I have a client here in France who has a house in a remote location. The house has been broken into three times this year and I have been asked to install a GSM alarm with no outside or internal sounder, due to the fact that the last alarm system was just smashed off the wall. What I actually need is a lithium powered wireless alarm with a telephone dialer as the house it is to protect is remote and left unoccupied for long periods of time. The other problem is that the house does not have mains electricity, but a rather complex generator/battery set up which has been known not to auto-start.*"

Indeed, where no mains power is available, classical alarm systems are not applicable. This is commonly the case in off grid military depots, private boats, holiday homes, builder sheds, farm sheds, aircraft hangars, etc.

There are also cases where mains powered alarm systems fail to operate after a power blackout, due to a backup battery failure or a disturbance caused by the outage.

Infinite's autonomous RTUs, combined with new technology, ultra low power PIR sensors, offer advanced solutions in security. An SMS alarming system, consisting of a BSC-50E RTU and a low power PIR sensor for motion detection, can operate for over 10 years, powered only by one Lithium D-size battery!
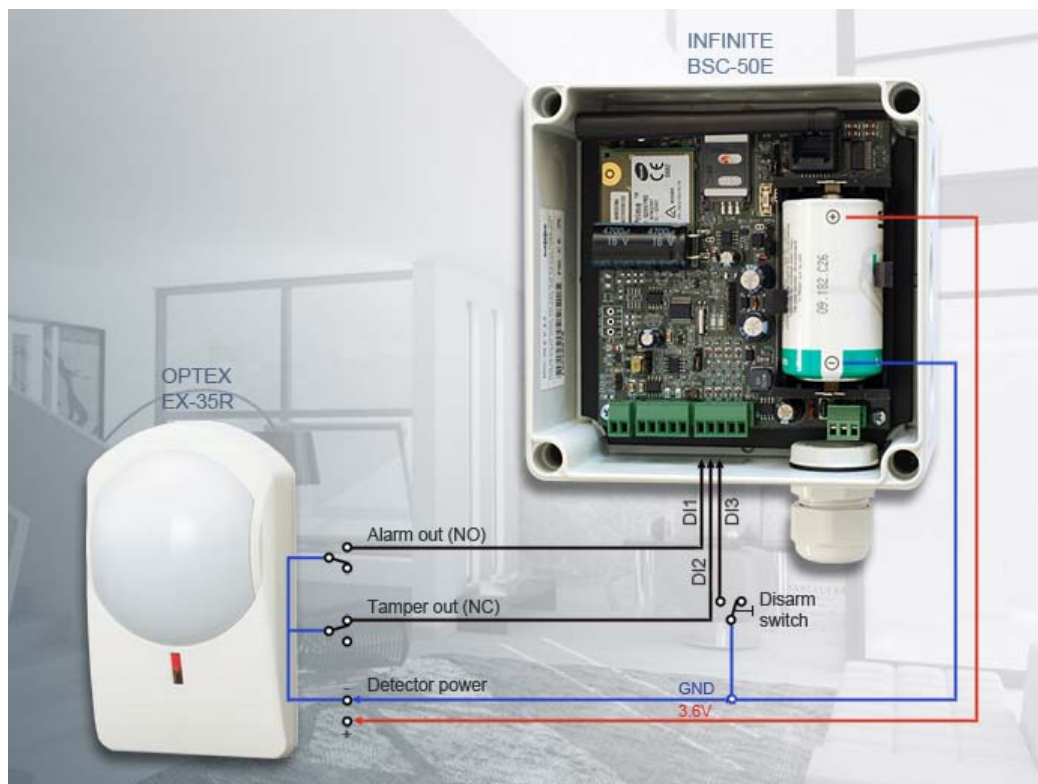
## Proposal

A BSC-50E battery powered RTU with an OPTEX EX-35R sensor is an optimal solution for long term, autonomous intrusion alarming. The EX-35R is an ultra low power PIR sensor, drawing only 3.5µA in standby operation. The PIR sensor is powered from the BSC-50E internal battery. A 'Walk test' option with LED indication can be selected, by a sensor internal jumper, for adjusting the detection range.

The sensor provides two Form C solid state switches (NO, NC, COM), one for motion alarm and one for tamper alarm. The sensor outputs are wired to the DI1 and DI2 BSC-50E digital inputs. The NO terminals are used for this purpose in order to save power, as the BSC-50E inputs feature an internal pull up resistor. A ON-OFF switch, wired to BSC-50E DI3, is used to enable or disable the GSM alarming (Arm/Disarm switch).

Up to 20 SMS recipients can be declared in the BSC-50E unit. The unit sends a Status SMS to the administrator on transitions between arm and disarm state. The unit can also send periodical status messages to the administrator, for verifying the system availability and GSM signal strength. A wireless RF Remote Control Switch, as the Velleman VM130 remote control set, can be applied in the place of a hand switch, for arming and disarming the alarm system remotely.

An additional digital input (DI4) is available for connecting door or window switches to the BSC-50E unit with a respective alarm annunciation.

The BSC-50E analog inputs can be used to measure and record temperature and humidity with periodical data transfer. The unit can remain connected on the GSM network for a short period (up to 255 seconds) after sending a Status SMS, expecting a remote configuration SMS from the system administrator, e.g. add or remove a user, change timings and rates, etc.

## Features

- SMS Alarming
- Autonomous operation for over 10 years
- Arm/Disarm capability
- Flexible user administration
- Periodically sending status messages
- Simple setup and installation
- Remote configuration capability

## Battery lifetime

Different low power sensors can be used for indoor and outdoor applications. The lifetime of the BSC-50E internal battery (LSH-20) depends on the current draw of the applied sensor. In some cases extra batteries for the sensors must be provided for the proper system operation. In the following table, the battery lifetime is calculated for different low power OPTEX motion sensors:

| Sensor | Application | Sensor batteries | BSC-50E Battery lifetime [Years] | System operation [Years] |
|---|---|---|---|---|
| EX-35R | Indoor | - | >10 | >10 |
| CX-0702RS | Indoor | - | >10 | >10 |
| FTN-R/RAM | Outdoor | - | >10 | >10 |
| BX-80NR | Outdoor | - | >10 | >10 |
| VX-402R | Outdoor | - | >10 | >10 |
| AX-100/200TFR | Perimeter | 2+2 [1] | >10 | >3 [2] |
| SL-350QFR/QNR | Perimeter | 4+4 [1] | >10 | >8 [2] |

[1] SAFT LSH20 batteries are recommended from the sensor manufacturer for transmitter & receiver.

[2] The transmitter's batteries lifetime determines the maintenance free operation of the system.

## BSC-50E Configuration

Following ASCII commands can be used to setup the BSC-50E for the GSM Alarming application.

| Command | Remarks |
|---|---|
| `0195,0195` | Clear character translation (Default character set) |
| `0183,0183` | Factory defaults |
| `0300,My BSC-50E` | Set Unit name |
| `0630,1,Intrusion Alarm` | Set Alarm message text |
| `0630,2,Tamper Alarm` | Set Tamper message text |
| `1100,1,DI1,1,0` | Set DI1 as Motion alarm input (0→1 transition) |
| `1100,2,DI2,1,0` | Set DI2 as Tamper alarm input (0→1 transition) |
| `1101, 1,,1` | Select the DI1 message for the positive transition |
| `1101, 2,,2` | Select the DI2 message for the positive transition |
| `1300,0` | Disable logging |
| `0650,168` | Set the Status SMS period to one week (168 hours) |
| `0651,60` | Set the idle period after the Status SMS to 60 seconds |
| `0680` | Include GSM Signal measurements in Status SMS |
| `0700` | Enable Halt/Resume mode on DI3 (Arm/Disarm switch) |
| `0500,1,George,6946777690,1,1,1,0` | Create user 'George' as Administrator |
| `0500,2,Julia,6948335045,0,0,1,0` | Create user 'Julia' as alarm recipient |
| `0500,3,Paul,6974644288,0,0,1,0` | Create user 'Paul' as alarm recipient |
| `0205,0205` | Update the system controller |