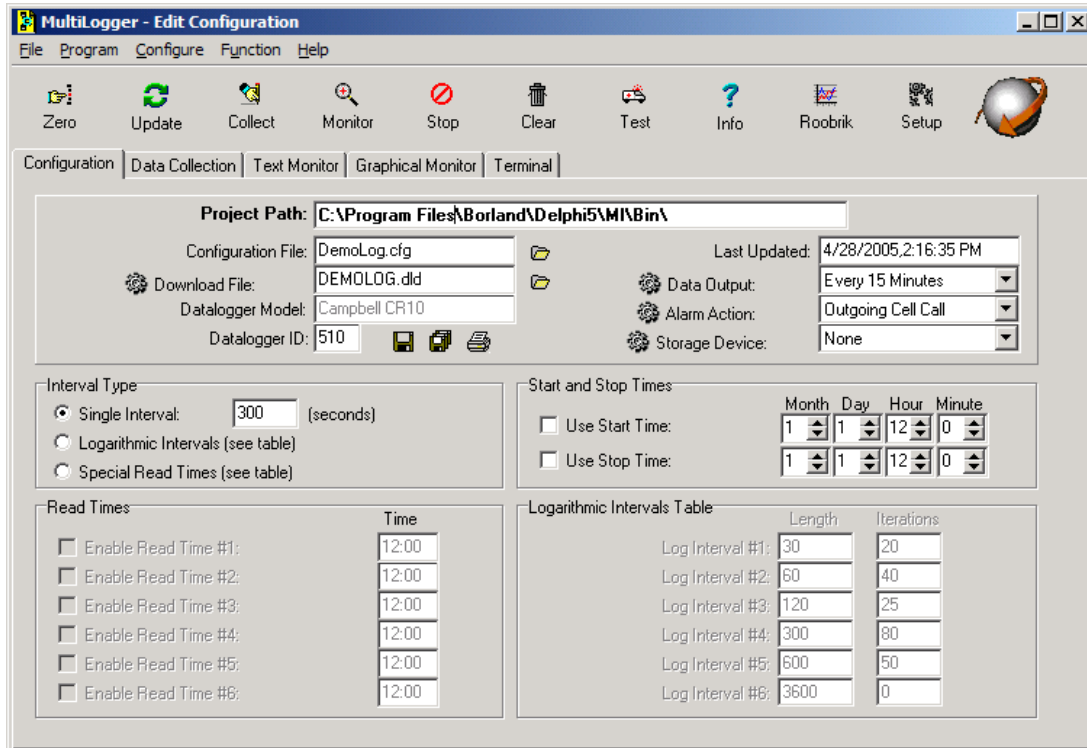




How to Configure the Alarm Action Outgoing Cell Call MultiLogger Application Note #14

Overview

Projects often require notification from the remote systems that an alarm event has occurred. This Application Note will provide details for configuring systems which have a cellular modem connected to them and the Alarm Action **Outgoing Cell Call** selected as the Alarm Action, as shown below.



Note: The instruction file referred to in this MultiLogger Application Note was included in MultiLogger beginning with version 3.2 Current versions of MultiLogger are available for download without charge to registered users, contact Canary Systems or your software vendor to register your software.

Operation Details

At present the instruction file only supports "Single Level" alarms, e.g. Alarm Types which only control one flag, this excludes using any of the two level alarm types for individual channels. (Contact Canary Systems if two level alarm types must be supported.) We'll assume the Single Interval, or measurement interval, is set to 300 seconds, or 5 minutes. In the event of an alarm condition an Input Location called AlarmCount is incremented. When AlarmCount reaches 3, or after 15 minutes, the dialing sequence is initiated. Up to 4 numbers are called, with approximately 30 seconds between calls, for a total call duration of approximately 2 minutes. No message is played, caller ID would be used to identify the system or systems. The instruction file then re-dials (assuming the alarm condition is persistent) after 5 iterations, or 25 minutes. Reset occurs if the alarm condition goes away or 11 iterations pass, or 55 minutes, so another dialing condition will be initiated 60 minutes from the initial dialing sequence, this basic sequence will repeat indefinitely until the user adjusts the logger programming, either by changing the alarm values or by disabling alarm checking for the particular channel that is in alarm.

Hardware Configuration

This MultiLogger Application Note assumes a cellular modem (or phone modem) is connected to the system. Contact Canary Systems or your hardware vendor to confirm the type of hardware connected to your system.

MultiLogger Configuration

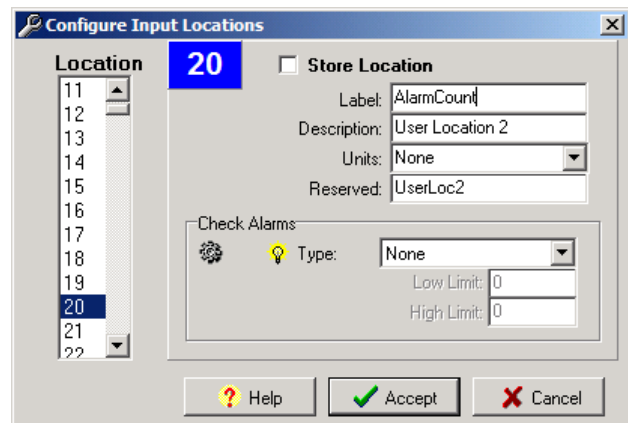
There are 3 steps to configuring the system to call out on alarm condition using the **Output Cell Call** option.

Step One – Alarm Action Configuration

This step is illustrated in the preceding screenshot, select **Outgoing Cell Call** as the **Alarm Action**. Note: For multiple systems programmed using the same Alarm Action but with DIFFERENT calling parameters, e.g. different phone numbers, new Alarm Action options must be added to differentiate the instruction files, use **MLSetup** to configure the new Alarm Action options. Unless you are very familiar with **MLSetup** it would be best to contact Canary Systems for assistance with this customization.

Step Two – Input Location Configuration

The instruction file, **alarmaction_outgoingcellcall.ins**, used to provide the Outgoing Cell Call functionality uses a single Input Location to record the number of consecutive alarms. This location is used to determine the point at which the initial calls are made, the re-dial is initiated and when the auto-reset occurs. Configure this location by selecting **Program | Input Locations** from the Logger menu. Scroll the list down to location #20 and enter AlarmCount as the **Label**, an example screenshot is shown at right.



Step Three – Instruction File Configuration

The Instruction File which provides the calling functionality must be configured to make the calls, at a minimum the phone numbers must be entered, the defaults may be used for other options. The following section will detail more advanced customizations.

Edit the **alarmaction_outgoingcellcall.ins** Instruction File by clicking on the gear button located on the Alarm Action button. This will load the Instruction File into MLEditor, a program supplied with MultiLogger which is used for modifying various pieces of the system programming.

Notice the text at the top providing explanations regarding the file.

Scroll down to view the actual programming code, instructions are shown prefaced by the letter 'P', numbered parameters follow under the instruction number.

Scroll down to the first 'P63', this instruction provides parameters for the dialing command, in this case it must be modified to include the phone number to dial. See the following instruction file section:

```
P63   Extended Parameters ;
1: [65           ] Option ; 'A'
2: [84           ] Option ; 'T'
3: [68           ] Option ; 'D'
4: [49           ] Option ; 1
5: [54           ] Option ; 6
6: [48           ] Option ; 0
7: [51           ] Option ; 3
8: [53           ] Option ; 5

P63   Extended Parameters ;
1: [50           ] Option ; 2
2: [54           ] Option ; 6
3: [57           ] Option ; 9
4: [48           ] Option ; 0
5: [48           ] Option ; 0
6: [52           ] Option ; 4
7: [13          ] Option ; 'cr'
8: [0            ] Option ;

P63   Extended Parameters ;
1: [0            ] Option ;
2: [0            ] Option ;
3: [0            ] Option ;
4: [0            ] Option ;
5: [0            ] Option ;
6: [0            ] Option ;
7: [0            ] Option ;
8: [0            ] Option ;
```

Note the first 3 parameters of the first P63 include the dialing command for the modem. The actual number begins with the 4th parameter, a '1' shown above. Enter each digit in succession, continue to the next P63 to continue the number, as shown above. **NOTE: The values entered refer to ASCII digit equivalents, YOU MUST USE THESE VALUES FOR THE DIALING TO FUNCTION!**

The following table lists numeric digits and ASCII equivalents which can be entered into the program.

Number	ASCII Equivalent
0	48
1	49
2	50
3	51
4	52
5	53
6	54
7	55
8	56
9	57

Note that the last digit must be '13', or a Carriage Return. The following digit must be '0' to indicate the end of the dialing sequence.

Scroll down the Instruction File to find similar sections for the remaining 3 numbers that are to be dialed.

When finished modifying the phone numbers, press the **Save** button to save the changes.

Instruction File Customization

A number of the operational parameters of the instruction file can be modified to suit a specific application. These include the following:

- The number of consecutive alarms before initial dialing sequence is initiated. Locate the following instruction near the top of the Instruction File:

```
;Check whether we have exceeded minimum number of consecutive alarms
P89   If (X<=>F)      ;
1:[AlarmCount      ]   X Loc  ;
2:[1                ]   Comparison Code Option (=) ;
3:[3                ]   F      ; Enter Consecutive Alarm Count here
4:[11               ]   Command Code Option (Set Flag 1 High) ;
```

The third parameter ('3') configures the number of consecutive alarms, modify as needed.

- **The number of iterations before re-dial occurs.** Location the following instruction near the top of the Instruction File:

```
;Check whether we have reached our re-dial count
P89   If (X<=>F)      ;
1:[AlarmCount      ]   X Loc  ;
2:[1                ]   Comparison Code Option (=) ;
3:[5                ]   F      ; Enter Re-dial Alarm Count here
4:[11               ]   Command Code Option (Set Flag 1 High) ;
```

The third parameter ('5') configures the re-dial count, modify as needed. Set to the same value as the consecutive alarms parameter to disable re-dial.

- **The number of iterations before auto-reset occurs.** Auto-reset also occurs if the alarm condition goes away. Location the following instruction near the top of the Instruction File:

```
;Check whether we have reached our auto-reset count
P89   If (X<=>F)      ;
1:[AlarmCount      ]   X Loc  ;
2:[3                ]   Comparison Code Option (>=) ;
3:[11               ]   F      ; For interval n+1 x Scan Interval
4:[30               ]   Command Code Option (Then Do) ;
```

The third parameter ('11') configures the number of iterations before auto-reset occurs. The time between call sequences will be this value + 1, using the values shown, 60 minutes. To disable auto-reset set this value to 0, to auto-reset as soon as the re-dial is finished set this value to match the re-dial count.

- The delay between dialing of numbers. The default is 30 seconds, more or less may be specified depending on how many rings are needed. Locate the following instruction following each Hang up sequence:

```
;Delay before Hangup - 30 seconds
P22   Excitation with Delay ;
1:[1                ]   Ex Channel ;
2:[0                ]   Delay W/Ex (units = 0.01 sec) ;
3:[3000             ]   Delay After Ex (units = 0.01 sec) ;
4:[0                ]   mV Excitation ;
```

The third parameter ('3000') configures the delay after the number has been dialed. This value is in units of 10milliseconds, so 3000 = 30 seconds. **Note: There will be (4) places to make this modification!**

Runtime Customization

In addition, while the system is running and the Text Monitor is active, individual phone numbers can be disabled for dial-out by activating the appropriate Flag, Flags 2-5 correspond with phone numbers 1-4. Simply click on the Flag status button which corresponds with the number you wish to disable, the flag will be toggled, Low to High or High to Low, the screenshot illustrates the 3rd and 4th phone numbers have been disabled.

Note: Do not toggle the states of the other flags!

Location	Value	Location	Value	Location	Value	Location	Value
1:Year	2005.00000000						
2:Julian Day	144.00000000						
3:Time HHMM	1915.00000000						
4:Seconds	0.00000000						
9:Battery Voltage	12.08800000						
10:Panel Temp	27.89700000						
11:Read Timer	9.50000000						
16:Program Mode	0.00000000						
17:Read Sequence	9.00000000						
20:AlarmCount	0.00000000						
31:BAROMETER	532.84000000						
32:LF TD1C	-6.20910000						
33:RT TD2C	-4.30990000						

The Flag settings will persist after the Text Monitor is stopped and the connection to the system is closed.

Outgoing Cell Call Instruction File (alarmaction_outgoingcellcall.ins)

```
-----  
;Instruction file to call up to 4 phone numbers if Alarm Condition  
;Consecutive alarms required before dialing is triggered  
;Two re-dial attempts are made.  
  
;There is no call acknowledgement - Alarm routine resets automatically  
  
;Values to be configured:  
;(4) Phone Numbers  
;Consecutive Alarms value (default is 3)  
;Redial Iterations (default is 2, if scan interval is 5 minutes = 10 min redial)  
;Auto-reset Iterations (default is 11, if scan interval is 5 minutes = 60 min reset)  
  
;See comments in Instruction File to locate where these values must be entered  
  
;Canary Systems, Inc.  
;May 20, 2005  
-----  
;Send AT commands to dial the modem  
;Phone digit Values  
;48 = Number 0  
;49 = Number 1  
;50 = Number 2  
;51 = Number 3  
;52 = Number 4  
;53 = Number 5  
;54 = Number 6  
;55 = Number 7  
;56 = Number 8  
;57 = Number 9  
  
;Terminate the P63 with 0  
-----  
  
;Make sure we reset our Time to Dial flag  
P86 Do ;  
1:[21 ] Command Code Option (Set Flag 1 Low) ;  
  
;Check the Alarm Flag  
P91 If Flag/Port ;Check the Alarm flag  
01:[18 ] Flag/Port Options (Do if Flag 8 is High);  
02:[30 ] Command Code Option (Then Do) ;  
  
;Increment our Alarm counter  
P32 Z=Z+1 ;  
1:[AlarmCount ] Z Loc ;  
  
;Check whether we have exceeded minimum number of consecutive alarms  
P89 If (X<=>F) ;  
1:[AlarmCount ] X Loc ;  
2:[1 ] Comparison Code Option (=) ;  
3:[3 ] F ; Enter Consecutive Alarm Count here  
4:[11 ] Command Code Option (Set Flag 1 High) ;  
  
;Check whether we have reached our re-dial count  
P89 If (X<=>F) ;  
1:[AlarmCount ] X Loc ;  
2:[1 ] Comparison Code Option (=) ;  
3:[5 ] F ; Enter Re-dial Alarm Count here  
4:[11 ] Command Code Option (Set Flag 1 High) ;
```

```

;Check whether we have reached our auto-reset count
P89   If (X<=>F)      ;
1:[AlarmCount      ]   X Loc  ;
2:[3                ]   Comparison Code Option (>=)      ;
3:[11               ]   F      ; For interval n+1 x Scan Interval
4:[30               ]   Command Code Option (Then Do)    ;

;Reset our AlarmCount
P30   Z=F          ;
1:[0              ]   F      ;
2:[0              ]   Exponent of 10      ;
3:[AlarmCount     ]   Z Loc  ;

P95   End          ;

;Now check whether to initiate dial sequence
P91   If Flag/Port ;
1:[11             ]   Flag/Port Options (Do if Flag 1 is High);
2:[30             ]   Command Code Option (Then Do)      ;

;Dial the first number
P91   If Flag/Port ;
1:[22             ]   Flag/Port Options (Do if Flag 2 is Low) ;
2:[30             ]   Command Code Option (Then Do)      ;

P98   Send Printer Character      ;
1:[42             ]   p98 printer (Printer/9600 Baud)    ;

P63   Extended Parameters ;
1:[65             ]   Option ; 'A'
2:[84             ]   Option ; 'T'
3:[68             ]   Option ; 'D'
4:[49             ]   Option ; 1
5:[54             ]   Option ; 6
6:[48             ]   Option ; 0
7:[51             ]   Option ; 3
8:[53             ]   Option ; 5

P63   Extended Parameters ;
1:[50             ]   Option ; 2
2:[54             ]   Option ; 6
3:[57             ]   Option ; 9
4:[48             ]   Option ; 0
5:[48             ]   Option ; 0
6:[52             ]   Option ; 4
7:[13            ]   Option ; <CR>
8:[0              ]   Option ;

P63   Extended Parameters ;
1:[0              ]   Option ;
2:[0              ]   Option ;
3:[0              ]   Option ;
4:[0              ]   Option ;
5:[0              ]   Option ;
6:[0              ]   Option ;
7:[0              ]   Option ;
8:[0              ]   Option ;

;Delay before Hangup - 30 seconds
P22   Excitation with Delay      ;
1:[1              ]   Ex Channel  ;
2:[0              ]   Delay W/Ex (units = 0.01 sec)      ;
3:[3000           ]   Delay After Ex (units = 0.01 sec)  ;
4:[0              ]   mV Excitation;

P98   Send Printer Character      ;
1:[42             ]   p98 printer (Printer/9600 Baud)    ;

P63   Extended Parameters ;
1:[65             ]   Option ; 'A'
2:[84             ]   Option ; 'T'
3:[72             ]   Option ; 'H'
4:[13            ]   Option ; <CR>

```

```

5:[0          ] Option ;
6:[0          ] Option ;
7:[0          ] Option ;
8:[0          ] Option ;

;Delay after Hangup - 1 second
P22  Excitation with Delay ;
1:[1          ] Ex Channel ;
2:[0          ] Delay W/Ex (units = 0.01 sec) ;
3:[10         ] Delay After Ex (units = 0.01 sec) ;
4:[0          ] mV Excitation ;

P95  End ;

;Dial the second number
P91  If Flag/Port ;
1:[23         ] Flag/Port Options (Do if Flag 3 is Low) ;
2:[30         ] Command Code Option (Then Do) ;

P98  Send Printer Character ;
1:[42         ] p98 printer (Printer/9600 Baud) ;

P63  Extended Parameters ;
1:[65         ] Option ; 'A'
2:[84         ] Option ; 'T'
3:[68         ] Option ; 'D'
4:[49         ] Option ; 1
5:[54         ] Option ; 6
6:[48         ] Option ; 0
7:[51         ] Option ; 3
8:[53         ] Option ; 5

P63  Extended Parameters ;
1:[50         ] Option ; 2
2:[54         ] Option ; 6
3:[57         ] Option ; 9
4:[48         ] Option ; 0
5:[48         ] Option ; 0
6:[52         ] Option ; 4
7:[13         ] Option ; <CR>
8:[0          ] Option ;

P63  Extended Parameters ;
1:[0          ] Option ;
2:[0          ] Option ;
3:[0          ] Option ;
4:[0          ] Option ;
5:[0          ] Option ;
6:[0          ] Option ;
7:[0          ] Option ;
8:[0          ] Option ;

```



```

;Delay before Hangup - 30 seconds
P22 Excitation with Delay ;
1:[1 ] Ex Channel ;
2:[0 ] Delay W/Ex (units = 0.01 sec) ;
3:[3000 ] Delay After Ex (units = 0.01 sec) ;
4:[0 ] mV Excitation;

P98 Send Printer Character ;
1:[42 ] p98 printer (Printer/9600 Baud) ;

P63 Extended Parameters ;
1:[65 ] Option ; 'A'
2:[84 ] Option ; 'T'
3:[72 ] Option ; 'H'
4:[13 ] Option ; <CR>
5:[0 ] Option ;
6:[0 ] Option ;
7:[0 ] Option ;
8:[0 ] Option ;

;Delay after Hangup - 1 second
P22 Excitation with Delay ;
1:[1 ] Ex Channel ;
2:[0 ] Delay W/Ex (units = 0.01 sec) ;
3:[10 ] Delay After Ex (units = 0.01 sec) ;
4:[0 ] mV Excitation;

P95 End ;

;Dial the third number
P91 If Flag/Port ;
1:[24 ] Flag/Port Options (Do if Flag 4 is Low) ;
2:[30 ] Command Code Option (Then Do) ;

P98 Send Printer Character ;
1:[42 ] p98 printer (Printer/9600 Baud) ;

P63 Extended Parameters ;
1:[65 ] Option ; 'A'
2:[84 ] Option ; 'T'
3:[68 ] Option ; 'D'
4:[49 ] Option ; 1
5:[54 ] Option ; 6
6:[48 ] Option ; 0
7:[51 ] Option ; 3
8:[53 ] Option ; 5

P63 Extended Parameters ;
1:[50 ] Option ; 2
2:[54 ] Option ; 6
3:[57 ] Option ; 9
4:[48 ] Option ; 0
5:[48 ] Option ; 0
6:[52 ] Option ; 4
7:[13 ] Option ; <CR>
8:[0 ] Option ;

```

```

P63   Extended Parameters ;
1:[0] ] Option ;
2:[0] ] Option ;
3:[0] ] Option ;
4:[0] ] Option ;
5:[0] ] Option ;
6:[0] ] Option ;
7:[0] ] Option ;
8:[0] ] Option ;

;Delay before Hangup - 30 seconds
P22   Excitation with Delay ;
1:[1] ] Ex Channel ;
2:[0] ] Delay W/Ex (units = 0.01 sec) ;
3:[3000] ] Delay After Ex (units = 0.01 sec) ;
4:[0] ] mV Excitation ;

P98   Send Printer Character ;
1:[42] ] p98 printer (Printer/9600 Baud) ;

P63   Extended Parameters ;
1:[65] ] Option ; 'A'
2:[84] ] Option ; 'T'
3:[72] ] Option ; 'H'
4:[13] ] Option ; <CR>
5:[0] ] Option ;
6:[0] ] Option ;
7:[0] ] Option ;
8:[0] ] Option ;

;Delay after Hangup - 1 second
P22   Excitation with Delay ;
1:[1] ] Ex Channel ;
2:[0] ] Delay W/Ex (units = 0.01 sec) ;
3:[10] ] Delay After Ex (units = 0.01 sec) ;
4:[0] ] mV Excitation ;

P95   End ;

;Dial the fourth number
P91   If Flag/Port ;
1:[25] ] Flag/Port Options (Do if Flag 5 is Low) ;
2:[30] ] Command Code Option (Then Do) ;

P98   Send Printer Character ;
1:[42] ] p98 printer (Printer/9600 Baud) ;

P63   Extended Parameters ;
1:[65] ] Option ; 'A'
2:[84] ] Option ; 'T'
3:[68] ] Option ; 'D'
4:[49] ] Option ; 1
5:[54] ] Option ; 6
6:[48] ] Option ; 0
7:[51] ] Option ; 3
8:[53] ] Option ; 5

```

```

P63   Extended Parameters ;
1:[50           ] Option ; 2
2:[54           ] Option ; 6
3:[57           ] Option ; 9
4:[48           ] Option ; 0
5:[48           ] Option ; 0
6:[52           ] Option ; 4
7:[13          ] Option ; <CR>
8:[0            ] Option ;

P63   Extended Parameters ;
1:[0            ] Option ;
2:[0            ] Option ;
3:[0            ] Option ;
4:[0            ] Option ;
5:[0            ] Option ;
6:[0            ] Option ;
7:[0            ] Option ;
8:[0            ] Option ;

;Delay before Hangup - 30 seconds
P22   Excitation with Delay ;
1:[1            ] Ex Channel ;
2:[0            ] Delay W/Ex (units = 0.01 sec) ;
3:[3000         ] Delay After Ex (units = 0.01 sec) ;
4:[0            ] mV Excitation ;

P98   Send Printer Character ;
1:[42           ] p98 printer (Printer/9600 Baud) ;

P63   Extended Parameters ;
1:[65           ] Option ; 'A'
2:[84           ] Option ; 'T'
3:[72           ] Option ; 'H'
4:[13          ] Option ; <CR>
5:[0            ] Option ;
6:[0            ] Option ;
7:[0            ] Option ;
8:[0            ] Option ;

;Delay after Hangup - 1 second
P22   Excitation with Delay ;
1:[1            ] Ex Channel ;
2:[0            ] Delay W/Ex (units = 0.01 sec) ;
3:[10           ] Delay After Ex (units = 0.01 sec) ;
4:[0            ] mV Excitation ;

P95   End ;

;End Dialing Sequence
P95   End ;

P94   Else ;

;No Alarm - Make sure our alarm counter is reset
P30   Z=F ;
1:[0            ] F ;
2:[0            ] Exponent of 10 ;
3:[AlarmCount   ] Z Loc ;

P95   End ;

```