



TECHNICAL NOTE TN-1061-AN

TM8100 Emergency Mode Configuration

19 August 2005

Applicability

This Technical Note applies to the TM8100 Series of Radios

1. Introduction

The TM8100 has the ability to operate in two emergency modes – ‘Stealth’ and ‘Non Stealth’. In ‘Stealth Mode’ the radio will transmit an emergency call sequence and also cycle between Tx/Rx mode without any UI indication (there will be no indication that the radio is transmitting or receiving).

The push of a button or a toggle of an I/O line is all that is needed to activate ‘Emergency Mode’ and alert the dispatcher of an incident. The victim/caller does not need to operate the microphone as the radio will automatically transmit audio from the fist mic, auxiliary mic or a concealed mic in the control head.

The stealth option can only be activated from an auxiliary I/O line, i.e. a hidden switch.

There are many configurable options available for ‘Emergency Mode’ – this Technical Note describes these options and how to configure them on the TM8100.

As an example a selcall string with ANI will be used as the ‘Emergency Callout Sequence’ utilising stealth mode, high power and Tx/Rx cycling.

2. Hardware Configuration – External Input

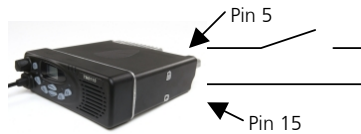
Requirements

To operate the radio in 'Stealth Emergency Mode' an external switch needs to be connected to the auxiliary port of the radio.

Hardware Setup

AUX_GPI2 (Pin 5) must be used for 'Emergency Mode' as this enables the radio to optionally enter 'Emergency Mode' from a powered off state. The radio has its own internal pull-ups for this line and can only be programmed as active low.

Please ensure that Hardware Link LK3 is Fitted (Factory Default)



Ensure that the switch is a contact when closed type (Normally Open).

NOTE: The switch input into the radio will need to be a 'Momentary' input, this ensures the 'Emergency Call' can be cleared/cancelled at the end of the emergency call out.

It is recommended that the switch is hidden in the vehicle in an appropriate place that it doesn't get pressed accidentally and is easily accessible in an emergency.

Radio Programming

Select the programmable I/O page and program AUX_GPI2 with the following settings:

- Direction: Input
- Action: Enter Emergency Mode
- Active: Low
- Debounce: 10ms

Select 'Stealth' or 'Non Stealth' in Action Parameters, Emergency Mode.

3. Emergency Mode Programming

Available Programming Options

Data -> GPS Tab -> Emergency Option

[Send Position on Emergency Callout](#): this enables an SDM containing the vehicles GPS location to be sent after an emergency callout sequence is sent (defined below).

Selcall -> Free Format Bursts Page -> Sequences Option

The [Emergency Sequence](#) that is entered here will be sent on activation of an emergency call. This is for a Selcall network only.

DTMF -> DTMF Signalling Page -> Systems Tab -> Sequences Option

The [Emergency Sequence](#) that is entered here will be sent on activation of an emergency call. This is for a DTMF network only.

MDC1200 -> MDC1200 Options -> Presets Option

The [ANI Sequence](#) that is entered here will be sent on activation of an emergency call. This is for an MDC1200 network only. An SFE key is

needed to enable MDC1200 in the radio.

Networks -> Emergency Page -> Activation Tab -> Activation

Emergency Enabled: enables or disables emergency mode for this network.

Signalling Type: will be either DTMF or Selcall as defined on the Basic Settings page.

Channel Type: can be set to Current or Dedicated. This option refers to whether the radio will switch to a dedicated channel or remain on the current channel after emergency mode is activated.

The **Channel** drop down box can be set when the 'Channel Type' is set to 'Dedicated'. This selects a dedicated channel that the radio will make the emergency call on.

Tx on High Power: sets whether the RF power when emergency mode is activated is High or the channels RF power setting.

Networks -> Emergency Page -> Activation Tab -> Callout

Callout Type: determines whether the radio enters a callout phase (sending Selcall / DTMF sequence) after emergency activation, available options are:

- **Disabled:** radio begins Tx/Rx cycling immediately after emergency is activated.
- **Continuous:** radio sends the Selcall/DTMF emergency sequence until a valid emergency acknowledgement is received.
- **Fixed:** radio sends the Selcall/DTMF emergency sequence until a valid emergency acknowledgement is received or the Number of Callouts have expired.

Number of Callouts: can be set when the callout type is Fixed.

Callout Repeat Interval: sets the time interval between emergency callouts, this also sets the delay before Tx/Rx cycling when the numbers of callouts have expired.

Networks -> Emergency Page -> Cycling Tab -> Emergency Callout

These options relate to the Tx/Rx cycling of the radio.

Emergency Cycling Type, can be either:

- **Disabled:** there will be NO Tx/Rx cycling, the radio will exit emergency mode immediately.
- **Continuous:** the radio enters Tx/Rx cycling mode until emergency mode ends from a power cycle or a valid emergency acknowledgement (for this option a reasonable period of time for the Rx cycle is needed to ensure the acknowledgement can be received).
- **Fixed:** the radio will enter the Tx/Rx cycling mode for a fixed number of cycles as defined in 'Number of Cycles'.

Number of Cycles: can only be set when the Emergency Cycling Type is set to Fixed. This defines how many Tx/Rx cycles the radio will complete.

Rx Time: sets the amount of time that the radio will remain in receive mode when Tx/Rx cycling.

Tx Time: sets the amount of time that the radio will remain in transmit mode when Tx/Rx cycling.

Emergency ANI: this option sets whether a Selcall, DTMF or an MDC1200

ANI sequence is sent at the beginning of each Tx cycle phase. The radio's ANI is configured in the Networks ANI Sequence.

Send SIBT on Tx Cycle: the radio can be configured to send a Single in Band Tone in each Tx cycle phase. This will need to be configured in the Networks -> Basic Settings Page -> SIBT tab.

Tone Options: these options enable an over the air alert tone to be programmed.

Networks -> Emergency Page -> Stealth Options Tab

Allow False Powerdown: enables the radio to falsely power down when the radio is in stealth emergency mode and the radios On/Off key is pressed. All UI indications will show the radio as off but the radio will remain in stealth mode. Pressing the On/Off key for a second time will return the radio to normal operation.

With the tick box un-ticked, the radio will exit emergency mode and restart when the On/Off key is pressed.

Action on Reset Call Received will be activated upon receipt of a Remote Monitor Reset or an Appended C Tone Monitor Reset – both selcall settings defined in Selcall -> Selcall Identity Tab. Available settings:

- **Exit Emergency Mode:** radio will exit emergency mode and resume normal operation.
- **Toggle Cycling/Quiet Mode:** radio will toggle between Emergency Cycling Mode and Quiet Mode where the radio stays in receive mode. To exit from this mode the On/Off key must be pressed.

UI Preferences -> Audio Setup

Emergency Mic: sets what microphone will be used in emergency mode. This can be either the control head mic, an externally connected mic through the auxiliary port or a concealed mic fitted in the control head (TMAA02-06).

There is NO need to manually press the mic PTT when in emergency mode as the radio automatically transmits audio from the emergency mic in the Tx cycling phase.

Control Head Mic Gain: when this option is set to concealed mic – it is recommended that the control head mic gain is set to High as this increases the performance of the microphone at a distance.

Key Settings -> Function Key Actions

Any of the Function Keys can be programmed as **Emergency Mode**. When accessing Emergency Mode from a function key, Emergency Mode is limited to Non Stealth.

Programmable I/O -> Digital Tab -> Action Parameters

Emergency Mode: sets whether the emergency mode is Stealth or Non-Stealth when activated from an I/O line.

4. Programming Example

Description

This example shows how to program emergency mode utilising Stealth mode, an Emergency Selcall Sequence, ANI, Tx/Rx cycling and a different channel transmitting on high power.

Radio Programming

Program the radio with two channels (Channel ID's 1 and 2) using a different simplex frequency for each channel, set each channels power to low and Network 1.

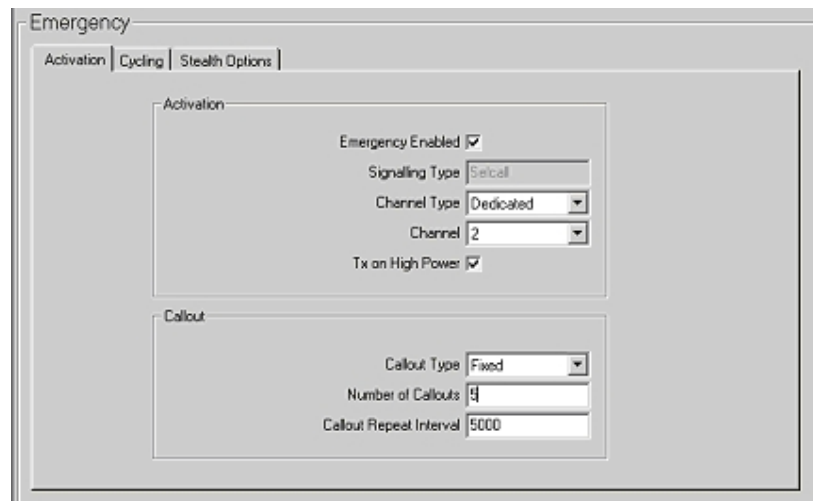
Setup a Selcall Identity with a Tx and Rx format of CCCCC-RRRRR-SS and a Rx Decode 1 Sequence of 12345.

Setup a Free Format Burst -> ANI Sequence of 12345.

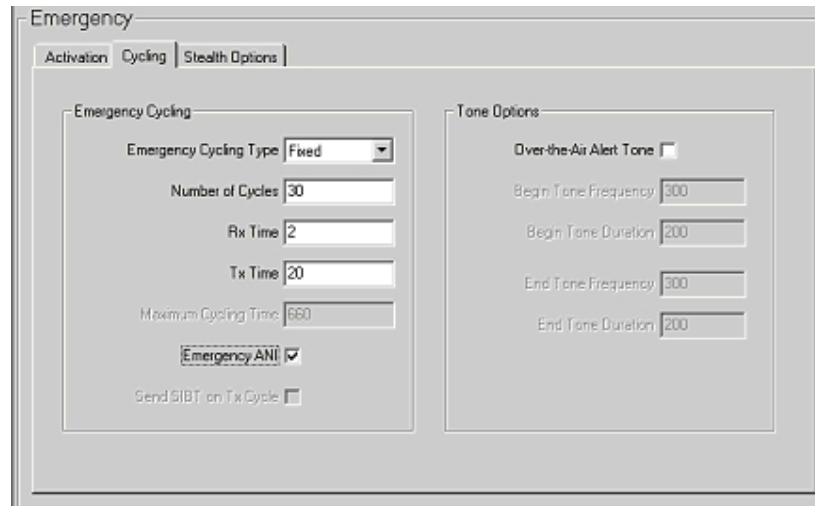
Setup a Free Format Burst -> Emergency Sequence of 12345-55555-99 (The emergency sequence will be sent to Unit 55555 with a Status of 99).

Configure Network 1 with a Signalling Type of Selcall ID 1.

Select the Networks -> Emergency -> Activation Tab and set up as per the image below.



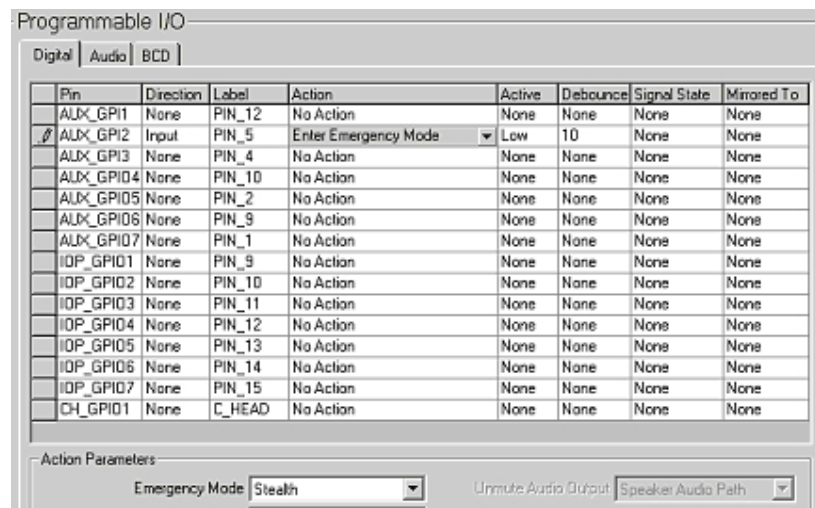
Select the Networks -> Emergency -> Cycling Tab and setup as per the image below.



Program the stealth options under the 'Stealth Options' tab to 'Allow False Powerdown' as enabled and 'Action on Reset Call Received' to 'Exit Emergency Mode'.

Select 'UI Preferences' and enable the 'Emergency Mic' as 'Control Head'.

Select the 'Programmable I/O' form and set 'AUX_GPI2' to the following settings as per the image below.



Program the radio with the settings above and use a 2nd radio or a Test-Set setup to decode the selcall on channel 2's frequency.

Upon toggling AUX_GPI2 low through a switch, the following events will take place

1. Radio will display Channel 1 – no other UI Indicators will function – i.e. Tx LED will not turn on.
2. Radio will transmit on high power the Emergency Sequence of 13245-55555-99 on channel 2 Tx frequency. This will happen 5 times at an interval of 5seconds between transmissions.
3. Radio will go into Tx/Rx cycling state of Rx for 2seconds and Tx for 20seconds. Audio from the fist mic will be transmitted

while in the Tx cycle. This cycling phase will happen 30times, then the radio will reset and power up into normal mode.

NOTE: If during any of the above events the radio is powered off through the control head On/Off key (maybe by an attacker) the radio will falsely power down and remain in emergency mode. If the radio is powered back on via the control head On/Off key, the radio will exit from emergency mode.

Compliance Issues None

CSO Instruction None

5. Issuing Authority

Name and Position of Issuing Officer Andrew Hill
Development Technician

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