SRT278 Avant Fleet
Functional Description

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GSM Working Modes

GSM Always On Mode

If GSMAlwaysOn is set, both GSM and GPS are on all the time until a new command which cancels this configuration is received.

GSM Ignition Mode

If GSMIgnitionModeEnable is set, detection of an off-to-on transition on IGN input turns GSM and GPS on. GSM and GPS are turned off when an on-to-off transition on IGN input is detected.

GSM Motion Mode

If VSControlsGSM is set and the unit is equipped with a vibration sensor, detection of vibrations turns the GSM and GPS on. They will be kept on as long as the vibrations continue and turned off when no vibrations are detected. The time needed to detect that vibrations have stopped is configurable.

GSM Timer Mode

If the unit has any messages to send while GSM is off, it turns the GSM and GPS on in GSM Timer Mode.

Another event which turns the GSM and GPS on in GSM Timer Mode is GSM off timer timeout. If GSMWakeUpEnable is set, the GSM off timer is started with GSMOffTime each time GSM is turned off. If no other events occur which turns the GSM and GPS on, the expiration of this timer turns the GSM and GPS on in GSM Timer Mode.

Lastly, there are three non-maskable events which turn the GSM and GPS on in GSM Timer Mode: hardware reset, off-to-on transition on ~ON/OFF, and termination of low voltage mode. If any of these three events occur, the GSM/GPS will be turned on in GSM Timer Mode and this is not user configurable. But, the transmission of corresponding messages is user configurable (HWResetMsgEnable, PWROnMsgEnable and LVMMsgEnable.)

In GSM Timer Mode, after registration, the unit will send the message(s), if any, check the incoming messages and wait for a valid GPS fix while the GSM on timer, which is started with GSMOnTime, is running. If GPS fix is obtained before GSM on timer timeout, a GPS fix message, if enabled by setting GPSFixMsgEnable, will be sent and the GSM and GPS will be turned off. If GPSFixMsgEnable is not set or if no valid fix is obtained while the GSM on timer is running, the GSM and GPS will be turned off when GSM on timer timeout occurs.

GSM Mode Priority Order

GSM Always on Mode has the highest priority, i.e. if this mode is enabled; the unit will be in this mode whatever happens otherwise. After this, the highest priority is given to GSM Ignition Mode and the lowest priority to GSM Timer Mode. For instance, if the GSM and GPS are turned on in GPS Timer Mode and an IGN input off-to-on transition is detected, the unit will enter into GSM Ignition Mode.

GSM/GPRS Coverage

If there is no GSM coverage, the unit will continue to be on, although it cannot forward the messages. Instead it will store the messages into the non-volatile memory to be forwarded later on. At the same time, the unit will try to register into GSM network all the time. Furthermore the GSM part will be reset every 30 minutes to make sure that it can perform a registration attempt from scratch.

If there is no GPRS coverage or if the GPRS communication doesn't work properly, the unit may forward messages by SMS if it is configured for this. It can also store messages which can be forwarded later on. In any case, the unit will try to re-establish the GPRS communication all the time. Furthermore the GPRS communication will be reset every 30 minutes to make sure that it can perform a re-establishment attempt from scratch.

If the GSM is turned on to transmit a main power disconnect message while the power source is main power or a battery disconnect message while the power source is battery so that the unit is going to enter into low voltage mode as soon as the message is sent, and if GSM registration failure occurs under these circumstances, the unit will enter into low voltage mode directly without scheduling any new trial to send the message.

GPS Working Modes

There are two GPS working modes: GPS On While GSM On mode and GPS Timer Mode.
In the first case, the GPS is turned on and off together with the GSM as described above.
GPS Timer Mode is intended to be used for tow-away detection. If GPSWakeUpEnable bit is set, the GPS off timer is started with GPSOffTime each time the GPS is turned off. Then, a GPS off timer timeout will turn the GPS on under the condition that the GSM is not on. While the GPS is on in timer mode, it will wait for valid GPS fixes while the GPS on timer is running which is started with GPSOnTime.
If valid fixes are obtained, the current position will be compared to the position stored when the latest on-to-off transition on IGN input was detected. If a tow-away is detected, this will turn the GSM on in timer mode to transmit a tow alarm message. Otherwise the GPS will turn off after the validation of no tow-away event. If no valid fixes are obtained to validate whether a tow-away event occurred or not and GPS on timer timeout occurs, this will turn the GPS off and terminate the timer mode until the next GPS off timer timeout.
Tow-away detection parameters are configured separately.

Events

Power

Main power related events

These events are grouped under three categories: absent/attach level detection, low/good level detection and disconnect/connect level detection.
Absent/attach detection level is 1.0V and is not possible to configure.
The other four levels are configurable parameters, and the correspondence between level and parameter is shown in the following table;

Level	Threshold parameter
Disconnect	MPDisconnectThreshold
Connect	MPConnectThreshold
Low	MPLowThreshold
Good	MPGoodThreshold

For each group of main power related events there are configuration bits which enables or disables the transmission of corresponding messages;

Event	Parameter
Absent/Attach	MPAbsentMsgEnable
Disconnect/Connect	MPDisconnectMsgEnable
Low/Good	MPLowMsgEnable

If an event is detected and the message enable bit is set for the group which this event belongs to, the corresponding message will be transmitted. If the GSM is off, this will lead to the fact that the GSM and GPS will be turned on in GSM Timer Mode to be able to transmit the message.

Battery power related events

These events are grouped under three categories: absent/attach level detection, low/good level detection and disconnect/connect level detection.
Absent/attach detection level is 1.0V and is not possible to configure.
Low and disconnect detection levels are configurable parameters as shown in the following table;

Level	Threshold parameter
Disconnect	BATDisconnectThreshold
Low	BATLowThreshold

Detection levels for good and connect are the same and hardcoded to 3.8V. The difference lies in the detection time. If battery power is detected under low or disconnect levels, the increase of the level above 3.8V fox six seconds will be interpreted as battery power good while the battery-connect level detection requires that the battery level is above 3.8V for at least 4 minutes and 15 seconds.
For each group of battery power related events there are configuration bits which enable or disable the transmission of corresponding messages;

Event	Parameter
Absent/Attach	BATAbsentMsgEnable
Disconnect/Connect	BATDisconnectMsgEnable
Low/Good	BATLowMsgEnable

If an event is detected and the message enable bit is set for the group which this event belongs to, the corresponding message will be transmitted. If the GSM is off, this will lead to the fact that the GSM and GPS will be turned on in GSM Timer Mode to be able to transmit the message.

Power source selection

If there is a main power attached and its level is above the disconnect threshold, the power source will be main power.
If the main power is not attached, the power source is the battery.
If the main power is attached but the level is below the disconnect threshold and there is a battery attached, the power source is the battery.

Low voltage mode

Low voltage mode is entered under the following circumstances;

- Main power is attached, no battery attached, and the main power level is below the disconnect threshold
- No main power is attached, battery attached and the battery level is below the disconnect threshold
- Both main power and battery attached but both levels are below the disconnect threshold

In low voltage mode, the unit is still running, but neither the GSM nor the GPS will be turned on until low voltage mode is cancelled.

Battery charging

The battery, if it is attached, is charged if the main power is attached and its level is above the disconnect threshold. If the battery is already fully charged, no charging will be done. The battery charge threshold is 4.145V, and the charge current is rated at 800mA.

I/O

Vibration sensor

If a vibration sensor is attached to the unit (VSALARM), this can be used in two ways: as an alarm input, or as a tool to control the GSM/GPS operation.

Alarm input

The first case is enabled if VSAlarmEnable is set, with or without VSAlarmInverted, and VSControlsGSM is cleared.

Normal mode

If VSAlarmInverted is cleared, detection of vibrations generates an alarm message. Each time an alarm message is generated; further vibrations during a time period given by VSAlarmIdleTime will be ignored. Thereafter the detection of new vibrations will generate a new alarm message, and this will go on repeatedly.

Inverted mode

If VSAlarmInverted is set, it's the absence of vibrations which generates an alarm message. If no vibrations are detected during a timer period given by VSAlarmIdleTime, this will generate an alarm. After this, the timer will be restarted and a new alarm message will be generated if no vibrations are detected until the timeout occurs, and this will go on repeatedly. The idle timer is reset for each detected vibration.

GSM/GPS operations control

The second case is enabled if VSAlarmEnable is set, VSAlarmInverted is cleared and VSControlsGSM is set.
In this case, the detection of vibrations will turn the GSM and GPS on in GSM Motion Mode, if they are not already on. Each time a vibration is detected, the idle timer is restarted with a timeout period given by VSAlarmIdleTime. As long as no timeout occurs, the GSM and GPS are kept on.
If no vibrations are detected during a time period given by VSAlarmIdleTime, the GSM and GPS will be turned off, unless controlled by other means.
If VSControlMsgEnable is set, the unit will send motion start and motion stop messages at the beginning respectively end of the vibration process.

IR detector

The IRALARM input can be used as either a general purpose alarm input, or together with an infrared detector for motion detection. When used for motion detection with an IR detector, the parameter IRAlarmDetectionTime should be set to 0.

Alarm input

This alarm is enabled if the IRAlarmEnable bit is set with or without IRAlarmInverted bit set.
Each time an IRALARM activation/deactivation for a duration given by IRAlarmDetectionTime is detected, the idle timer is restarted. An alarm message will turn the GSM and GPS on, if they are not already on, in GSM Timer Mode to make it possible to transmit the message.

Normal mode

If IRAlarmInverted is cleared, activation of IRALARM for a duration given by IRAlarmDetectionTime generates an alarm message. Each time an alarm message is generated, the further activations of IRALARM during a time period given by IRAlarmIdleTime will be neglected. Thereafter new activations of IRALARM will generate a new alarm message and this will go on repeatedly.

Inverted mode

If IRAlarmInverted is set it is the absence of IRALARM activations which generates an alarm message. If no IRALARM activations are detected during a time period given by IRAlarmIdleTime, this will generate an alarm. After this the timer will be restarted and a new alarm message will be generated if no IRALARM activations are detected until the timeout occurs and this will go on repeatedly.

PB alarm

PBALARM is enabled if the PBAlarmEnable bit is set with or without the PBAlarmInverted bit set.
If PBAlarmInverted is cleared, the alarm is on when the input is floating (not connected to GND).
If PBAlarmInverted is set, the alarm is on when the input is low (connected to GND).
The alarm on and off detection times are given by the PBAlarmOnDetectionTime and PBAlarmOffDetectionTime regardless of the alarm input polarity.
When the alarm input is detected on for duration of PBAlarmOnDetectionTime, this will generate an alarm on message.
When the alarm input goes off for duration of PBAlarmOffDetectionTime, this will generate an alarm off message if the PBAlarmOffMsgEnable is set.
If an alarm on or off message is generated while the GSM and GPS are off, this will turn the GSM and GPS on in GSM Timer Mode to make it possible to transmit the message.
By setting a proper PBAlarmOffDetectionTime, this input can be used to generate only one alarm message instead of many if the input is connected to GND respectively left floating in a cadenced pattern (like a buzzer signal generated from a car alarm).

AUX alarm

AUXALARM is enabled if the AUXAlarmEnable bit is set with or without AUXAlarmInverted bit set.
If AUXAlarmInverted is cleared, the alarm is on when the input is floating (not connected to GND).
If AUXAlarmInverted is set, the alarm is on when the input is low (connected to GND).
The alarm on and off detection times are given by the AUXAlarmOnDetectionTime and AUXAlarmOffDetectionTime regardless of the alarm input on polarity.
When the alarm input is detected on for duration of AUXAlarmOnDetectionTime, this will generate an alarm on message.
When the alarm input goes off for a duration defined by AUXAlarmOffDetectionTime, this will generate an alarm off message if AUXAlarmOffMsgEnable is set.
If an alarm on or off message is generated while the GSM and GPS are off, this will turn the GSM and GPS on in GSM Timer Mode to make it possible to transmit the message.
By setting a proper AUXAlarmOffDetectionTime, this input can be used to generate only one alarm message instead of many if the input is connected to GND respectively left floating in a cadenced pattern (like a buzzer signal generated from a car alarm).

Temperature sensor

If a temperature sensor is connected to the unit, this can be used as an alarm input (TSALARM).
To start with, it is possible to configure the unit to transmit messages about whether a temperature sensor is attached to the unit or not by setting the TSAbsentMsgEnable.
Thereafter it is also possible to configure two different alarm levels: temperature alarm threshold 1 and 2 (Temp1AlarmThreshold and Temp2AlarmThreshold).
By selecting proper threshold levels and enabling the corresponding alarm enable bits (Temp1LHAlarmEnable, Temp1HLAlarmEnable, Temp2LHAlarmEnable and Temp2HLAlarmEnable) it is possible to configure the unit so that it can generate alarm messages when the temperature arises above a certain level, drops under a certain level or lies inside or outside of a certain temperature range.
Whenever a message is generated related to temperature sensor while the GSM and GPS are off, this will turn the GSM and GPS on in GSM Timer Mode to make it possible to transmit the message.

Analog inputs

There are two analog inputs available (AIN1 and AIN2).
To start with, it is possible to configure the unit to transmit messages about whether analog inputs are connected to a source or not by setting the AIN1AbsentMsgEnable respectively AIN2AbsentMsgEnable. Absent/attach detection level is 1V and is not possible to configure.
Thereafter it is also possible to configure two different alarm levels for each input: AIN1 low and high level thresholds and AIN2 low and high level thresholds (AIN1LowThreshold, AIN1HighThreshold, AIN2LowThreshold and AIN2HighThreshold).
By selecting proper threshold levels and enabling the corresponding alarm enable bits (AIN1LAlarmEnable, AIN1HAlarmEnable, AIN2LAlarmEnable, AIN2HAlarmEnable) it is possible to configure the unit so that it can generate alarm messages when the corresponding input level arises above a certain level, drops under a certain level or lies inside or outside of a certain level range.
If a certain low or high alarm is enabled, the message is generated when the corresponding level is detected. But, if the level goes back so that the alarm condition is cancelled, the message about this is generated only if the AIN1GoodMsgEnable and AIN2GoodMsgEnable parameters are set.
Whenever a message is generated related to analog inputs while the GSM and GPS are off, this will turn the GSM and GPS on in GSM Timer Mode to make it possible to transmit the message.

Ignition input

The IGN input is an active high input and is intended to be connected to the ignition signal of the vehicle to control the GSM/GPS operation in GSM Ignition Mode. The on or off detection time is determined by IGNDetectionTime parameter.
If IGNMsgEnable is set, the on-to-off and off-to-on transitions detected on this input will generate messages. As usual, if GSM and GPS are off when these messages are generated, the GSM and GPS will be turned on in GSM Timer Mode to make it possible to transmit the message.
There is also a timer associated with IGN input. This timer measures the IGN on-time since the unit was powered-up or since the last time the timer was reset.

AUXCTRL input

The AUXCTRL input is an active high input. The on or off detection time is determined by AUXCTRLDetectionTime parameter.
If AUXCTRLMsgEnable is set, the on-to-off and off-to-on transitions detected on this input will generate messages.
As usual, if GSM and GPS are off when these messages are generated, the GSM and GPS will be turned on in GSM Timer Mode to make it possible to transmit the message.
There is also a timer associated with AUXCTRL input. This timer measures the AUXCTRL on-time since the unit was powered-up or since the last time the timer was reset.

Privacy input

The privacy input is on when the PRV input is floating (not connected to GND) and off when it is low (connected to GND).
The on or off detection time is determined by DINDetectionTime parameter.
If PRVEnable is set, the unit will remove the GPS information from the messages sent while this input is on.

Digital inputs

The IGN, AUXCTRL, PRV, VSALARM, IRALARM, PBALARM and AUXALARM inputs can also function as general inputs.
Regardless of whether they are used as special function inputs or not, the statuses of these inputs are available in the messages transferred. The status shown in the messages may differ from the alarm status of the same input depending on what detection times are used.
The on or off detection time for PRV, VSALARM, IRALARM, PBALARM and AUXALARM inputs is determined by the DINDetectionTime parameter.
The on or off detection time for IGN input is determined by IGNDetectionTime parameter while the on or off detection time for AUXCTRL input is determined by AUXCTRLDetectionTime parameter.
As digital inputs, VSALARM, PRV, PBALARM and AUXALARM inputs are on when they are floating and off when they are connected to GND.
As digital inputs, IGN, AUXCTRL and IRALARM inputs are on when they are connected to a high signal and off when they are left floating or connected to GND.

~ON/OFF input

When this input is left floating the unit is on. When a high signal is applied to this input, the unit will be in off state.
This input can be useful to avoid unnecessary power consumption from the internal battery before the installation carried out, during transportation and so on.

Digital output

The digital output (DOUT) is a relay output. When it is active the RLIN input is connected to the RLOUT output internally. It is possible to control this output using the corresponding command. Furthermore, this output can be activated for a duration given by the DOUTActivationTime parameter when an alarm is detected and the alarm is configured to activate DOUT.
If the output is already activated with timer, when a new event that triggers a timed DOUT activation occurs, it is still activated only for the duration of the previous event.
If the output is activated with a command, when a new event that triggers a timed DOUT activation occurs, the output will stay activated.
The alarm events that may activate this output is determined by the following parameters:

AUXAlarmActivatesDOUT	VSAlarmActivatesDOUT
IRAlarmActivatesDOUT	PBAlarmActivatesDOUT
AIN1LAlarmActivatesDOUT	AIN1HAlarmActivatesDOUT
AIN2LAlarmActivatesDOUT	AIN2HAlarmActivatesDOUT
Temp1LHAlarmActivatesDOUT	Temp1HLAlarmActivatesDOUT
Temp2LHAlarmActivatesDOUT	Temp2HLAlarmActivatesDOUT

Microphone

The microphone is used for alarm calls and incoming calls.
Microphone sensitivity can be set using Microphone Gain Control parameter.
For alarm calls, the microphone can be configured to be enabled or disabled independently for the three possible voice number groups.
Further, the setting for if the microphone should be enabled or disabled for incoming calls is independent from that for alarm calls.

Speaker

The speaker is used for alarm calls and incoming calls.
Speaker volume can be set using Speaker Gain Control parameter.
For alarm calls, the speaker can be configured to be enabled or disabled independently for the three possible voice number groups.
Further, the setting for if the speaker should be enabled or disabled for incoming calls is independent from that for alarm calls.

GSM Status

This signal is identical to the signal which is used to drive the internal GSM status LED. This signal is not user configurable.

GPS

GPS fix message with filter

If the GSM is on, the unit will report when a new fix has been available for a time period specified by GPSFixMsgOnFilter. If set to 0, the unit will not generate this message.
Likewise, the unit will report when the fix first has been lost for a time period specified by GPSFixMsgOffFilter. If set to 0, the unit will not generate this message.
Both GPSFixMsgOnFilter and GPSFixMsgOffFilter can be set independently for all GSM working modes.

Tow detection

Tow detection functionality is available when the GPS is running in timer-mode, the GSM is not active and TowDetectionAlarmDistance is set.
If enabled, the unit will generate an alarm if the GPS detects a position outside of a rectangle defined by the width/height of TowDetectionAlarmDistance and a reference position. The reference position is automatically generated from the first valid fix after the last ignition on-to-off transition.

Geozone

Geozone alarm functionality is available when the GSM is active. The geozone alarms can be set independently for all GSM working modes.
If GeozoneAlarmEnableEnter and/or GeozoneAlarmEnableLeave is set, and the GPS has a fix, the current time of day is later than GeozoneAlarmEnabledTimeStart and earlier than GeozoneAlarmEnabledTimeEnd, the current position will be compared to the rectangular area defined by center coordinates set in GeozoneAlarmCenter and a the width/height defined by GeozoneAlarmDistance, to determine if the unit is inside/outside of a permitted area.

Distance

If DistMsgDistance is set and the GSM is active, the unit will send a message every time the unit has moved at least the distance defined by DistMsgDistance since the last generated message.
The DistMsgDistance can be configured independently for all GSM working modes.

Heading Change

Starting with GSM software version v9.1.1 it is possible to trigger distance messages with heading changes as well.
This is configured independently for each GSM working mode and its use is optional.
When HeadingChangeTriggerEnable is set, the function is active only when current speed is at or above HeadingChangeMinSpeed, and when active will take a reference heading and will trigger distance message if the current heading differs from reference heading by HeadingChangeThreshold or more degrees.

Speed

If the GSM is active and IdleSpeedMsgEnable is set, the unit will generate a message if the speed is lower than IdleSpeedStart for a time period specified by IdleSpeedStartTolerance. Another message will be generated when the speed has been higher than IdleSpeedStop for a time period specified by IdleSpeedStopTolerance.
Likewise, if the GSM is active and OverspeedMsgEnable is set, the unit will generate a message if the speed is higher than OverspeedStart for a time period specified by OverspeedStartTolerance. Another message will be generated when the speed has been lower than OverspeedStop for a time period specified by OverspeedStopTolerance.
The parameters IdleSpeedStartTolerance, IdleSpeedStopTolerance, IdleSpeedStart, IdleSpeedStop, IdleSpeedMsgEnable, OverspeedStartTolerance, OverspeedStopTolerance, OverspeedStart OverspeedStop and OverspeedMsgEnable can be configured independently for all GSM working modes.

Time

Periodic report

When the GSM is on, the unit can generate messages on a periodic basis. The periodic report interval can be configured separately for all GSM working modes. If an interval is configured for the current working mode, the unit will generate a message provided the time passed since the previous generated message, regardless of type, exceeds the configured value.
The parameters for the different working modes are; GSMAlwaysOnModePeriodicMsg, GSMIgnitionModePeriodicMsg, GSMMotionModePeriodicMsg and GSMTimerModePeriodicMsg.

Messages

Messages & Priority Classification

Message filtering

With MsgEnableMask messages can be enabled or disabled. For messages that are due to an alarm situation, if the message is disabled, the message will simply not be sent, but the alarm will still be processed, and will trigger DOUT activation if it is configured to do that.

Message priority classification

If a message is enabled with MsgEnableMask, and the corresponding bit is also set in MsgClassificationMask, this means that the message may be sent over SMS if GPRS fails or is not available. If the corresponding bit is cleared, the message will only be sent over GPRS when available.

Protocols

Four protocols are supported by the unit for sending messages.
SRT Binary Protocol, OVLS, SRT# Protocol and Custom Text.

Alarm Calls and Incoming Calls

Alarm Calls

The unit may be configured to make an alarm call after an event has been processed.
The configurations required for the unit to make an alarm call after a specific event is:

- The corresponding message must be enabled
- A voice number group needs to be specified for the corresponding message
- Numbers to call need to be specified in the selected number group
- Number of call attempts for the selected number group must be at least one
- If a message is wanted after the alarm call has either succeeded or failed, the Alarm Call Answered By and/or Alarm Call Not Answered messages need to be enabled

Microphone enable/disable, speaker enable/disable, maximum call duration and call attempt timeout are configured per number group while microphone and speaker gain are configured globally.

Incoming Calls

The unit can receive and handle incoming voice calls, and in this case the microphone and the speaker are enabled by default.
The maximum duration of an incoming call is limited by the *IncomingCallMaxDuration* parameter.
The unit can also be configured to allow incoming calls from selected numbers only. When no numbers are specified in the voice number group intended for access control, anyone can call the unit.

General

GPRS

Normal operation

Assuming the unit has received all relevant configurations; the unit will attach to the GPRS network, and connect to the server.
When the unit is connected to the server, it can receive commands from the server, as well as send messages and alarm reports to the server.
All messages sent to the server from the unit must be acknowledged by the server before any new message will be sent. All messages are sent to the server in the order they are generated by the unit.
If no acknowledge is received from the server, the unit will go into retry mode. If a message has been priority classified it may be sent over SMS instead, but there will be at least one retry over GPRS first.

Roaming operation

If the unit detects that GPRS is only available under roaming mode, the RoamAllowIP and RoamPreferredOnly parameters control if GPRS should be used at all.
If RoamAllowIP is cleared, then no messages will be sent over GPRS.
If RoamAllowIP is set, and RoamPreferredOnly is cleared, it will send messages over GPRS as if it was on the home network but still try operators from the list of preferred operators first, but if RoamPreferredOnly is set, it will only send messages over GPRS if the unit is connected to a network from the Preferred Operators list. If the list doesn't contain any operators, no messages will be sent over GPRS.

SMS

SMS operation

If GPRS is lost and any messages need to be sent that are priority classified, these messages will be sent with SMS to the configured SMS Server numbers, if they are available.
If a message type has been configured to be sent to an SMS Number Group, that message will not be sent to the SMS Server numbers, regardless of if there are any numbers configured for the SMS Number Group selected.

Access control

If one or both of the SMS Server numbers are defined, it is also only these numbers that may send commands to the unit over SMS.

Preferred Operators

Using preferred operators while roaming

The unit can be configured with a list of Preferred Operators to use for roaming operation.
If the unit is configured to only use operators from this list when roaming, messages will only be sent over GPRS if it is attached to an operator from the list.
Even when the unit is configured to allow IP while roaming, but doesn't enforce use of preferred operators, it will still attempt to use the preferred operators before any other, if there is any configured.