WoAD

V1.5.11

https://woad.sumusltd.com/

© 2019-2025 Sumus Technology Limited

Bringing the functionality of Winlink to your Android device

© 2019-2025 Sumus Technology Limited

© 2019-2025 Sumus Technology Limited

© 2019-2025 Sumus Technology Limited

© 2019-2025 Sumus Technology Limited

© 2019-2025 Sumus Technology Limited

Introduction

WoAD brings the functionality of the Winlink Global Radio E-mail® system to your Android device. Using WoAD you can send and receive e-mail messages through a Winlink Common Message Server (CMS), using either a VHF/UHF packet or internet connection. WoAD also supports peer-to-peer (P2P) connections to other Winlink P2P-capable clients, again through a packet or internet connection.

WoAD can be configured for packet connections from your Android device to use:

- AFSK - using the device's sound card and simple electronic circuitry to interface to the audio connections of a radio
- USB - using the device's USB host capability to connect to a packet modem or radio with built-in packet modem
- TCP/IP - using an internet connection to connect to an internet capable packet modem which is in turn interfaced to a radio
- Bluetooth - using the device's bluetooth capability to connect directly to a bluetooth-enabled radio or via a bluetooth capable packet modem
- BLE - using the device's BLE capability to connect directly to a BLE-enabled radio or via a BLE capable packet modem

The use of WoAD requires a valid amateur radio license.

© 2019-2025 Sumus Technology Limited

License

This license governs use of the accompanying software. If you use this software, you accept this license. If you do not accept this license, do not use the software.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 2019-2025 Sumus Technology Limited

Creating a Winlink Account

If you do not already have a Winlink account and intend to use a Winlink CMS (and not just a peer-to-peer connection) from WoAD then you will first need to create a Winlink account.

1. Settings
   - Enter your **call sign**
2. Sessions
   - Create a Telnet Winlink session if one does not already exist
   - Click on the Telnet Winlink session to select it
   - Run the selected session
3. Messages
   - Open the Inbox
     i. by clicking on the hamburger icon (≡) at the top left and clicking on **Inbox,** or by swiping in from the left edge and clicking on **Inbox**
   - Open the message from **SERVICE** with the subject '**Your New Winlink Account'**
4. Settings
   - Enter the account password, without quotes, given in the message into the **Winlink password** setting

Quick Start Guide

1. Settings
   - Enter your **call sign**
   - Enter your Winlink password if you'll be connecting to a Winlink gateway
2. Sessions
   - Create a New session or long click on an existing session to edit it
   - Select the desired "Session protocol"
   - Specify the "Session settings", which are dependent on the selected protocol
   - Save the session settings
3. New Message (optional)
   - Specify a call sign or email address in the "To" field
   - Enter a "Subject" and message body
   - "Post to Outbox" to send the message to the Outbox
4. Run a session

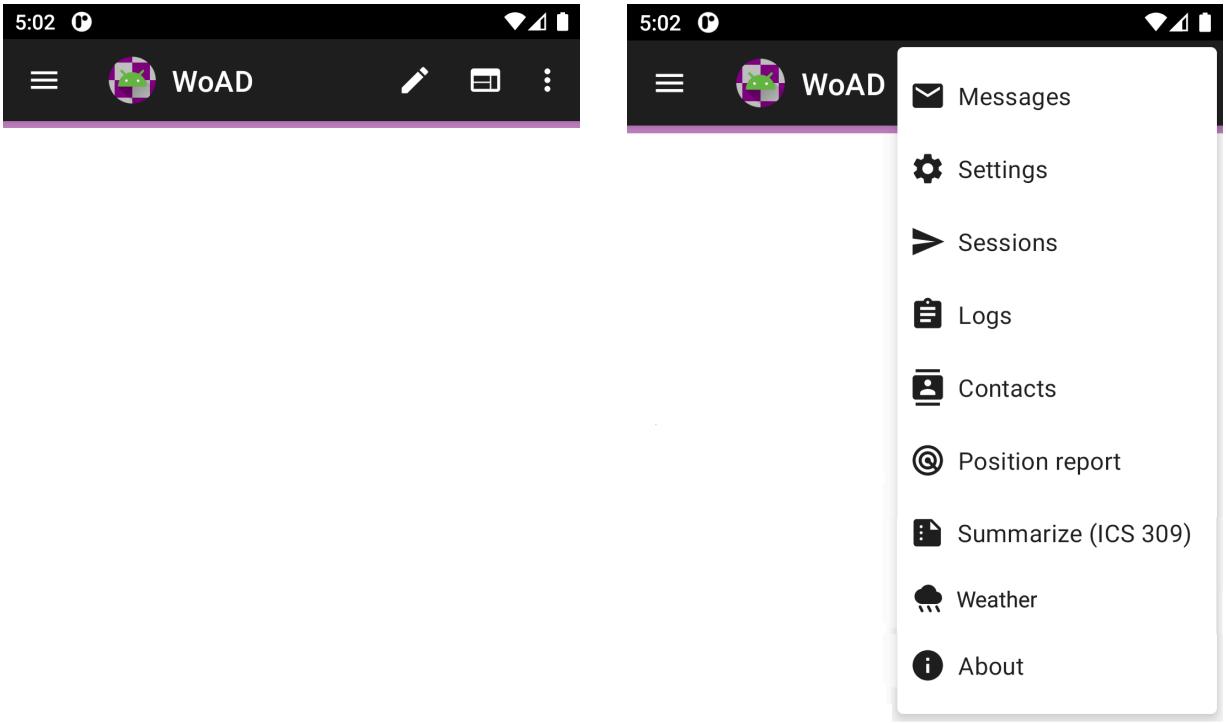
© 2019-2025 Sumus Technology Limited

- Click on the desired session to highlight it
- ▶ Run the selected session

© 2019-2025 Sumus Technology Limited

Navigation

Navigation within WoAD is achieved primarily through the top menu, located within the app's action (or app) bar. Each option within the top menu will open a corresponding primary screen that focuses on a specific functional area within WoAD, such as messages, settings, logs, *etc*.

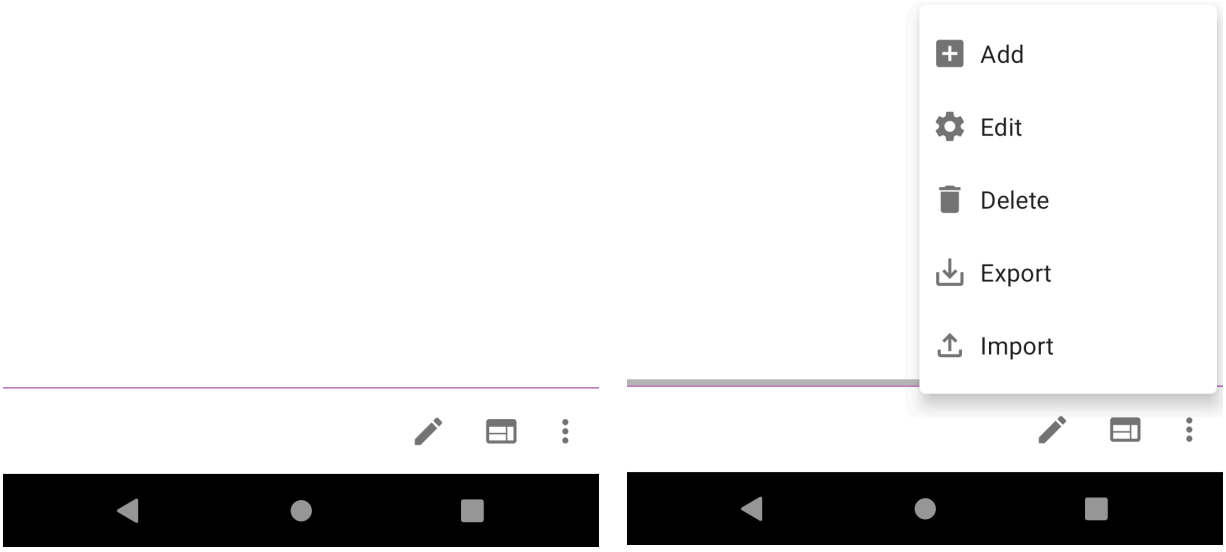


Typically each primary screen will provide one or more secondary screens, such as the **Contacts** primary screen providing an **Add** contact' secondary screen.

Your position within a functional area will be remembered if you leave it for another functional area. As an example, if you are in the **Settings** → **Message template** secondary screen and select the **Logs** top menu item, when you select **Settings** menu item again it will re-open to the **Message template** secondary screen. Thus, you are free to navigate between functional areas, knowing that you'll be able to return to the point where you previously left off.

Within each functional area there is typically a lower menu that allows for interaction with the primary and any secondary screens. For example the **Logs** screen provides a lower menu that allows you to select the messages of interest and to export the log messages to a file.

© 2019-2025 Sumus Technology Limited



© 2019-2025 Sumus Technology Limited

Top Menu

Note that clicking on a top menu will either open the selected screen, or, if you were previously working within a particular child screen, it will return you to that same child screen.

New message

Open the New Message screen.

New message from template

Open a message template, which can be selected from:

- one of the default templates which can be set at **Settings** → **Message Template** → **Default Message Templates**, Default templates are listed above the **Select template…** menu option.
- a list of all available templates which is opened from the **Select template…** option.
- one of the recently opened templates, which are listed below the **Select template…** option.

Messages

Open the Messages screen.

Settings

Open the Settings screen. You must set your call sign. If you plan to connect to a Winlink CMS you will also need to set your Winlink password.

Sessions

Open the Sessions screen.

Logs

Open the Logs screen.

Contacts

Open the Contacts screen.

© 2019-2025 Sumus Technology Limited

Other

The Other sub-menu is used for functionality that is not considered central to WoAD

Catalog Query

Opens the Catalog Query screen

GRIB File Request

Opens the GRIB File Request screen

Position Report

Opens the Position Report screen

Summarize (ICS 309)

Opens the ICS 309 screen to save a summary of the messages in the ICS 309 format

Template Server

Opens the Template Server screen to allow remote creation of messages

Terminals

Opens the Terminals screen

Weather

Open the Weather screen to display and request weather forecasts (courtesy of MET Norway)

About

Open the About dialog.

Debug

This item is present only in the debug build of WoAD.

© 2019-2025 Sumus Technology Limited

Navigation Drawer

The navigation drawer is opened by swiping a finger from the left edge of the activity. It can also be opened by tapping the “hamburger” menu ( ) in the action bar. The navigation drawer provides quick access to each of the standard message folders:

- Inbox
- Sent:
- Outbox
- Trash
- Drafts
- Partials
- Archive

as well as any user-defined tags, which are indicated by the icon together with the tag name.

The Inbox ( ) title is followed by a number indicating the number of unread messages, which in turn is followed by a bracketed number indicating the total number of messages. Thus “1 (4)” would indicate that the Inbox contains a total of 4 messages, 1 of which is unread.

All the other folders are followed by a single number giving the total number of messages.

© 2019-2025 Sumus Technology Limited

Tables

WoAD makes use of tables within several screens including:

- Attachments
- Contacts
- Logs
- Messages
- RMS Channel Selection
- Sessions
- Tags

In general the interaction with the tables is consistent and includes the following behavior:

Selection:

Tap on a row to select it. The selected row will be highlighted and several of the menu items in the screen will apply to the selected row. There are two exceptions to this behavior:

- in the Messages screen, tapping on a message will open the message.
- In the Logs screen, tapping on a log message will have no effect.

Sorting:

Each column label typically has a sort indicator to its left. Tapping on this indicator will sort on the entries of the corresponding column. The selected sort column is denoted by displaying the sort indicator as either  or  , depending on the sort direction.

Tapping on the sort indicator of the selected sort column will reverse the sort direction.

Ordering:

The column order can be changed by dragging and dropping a column from one location to another. Press and hold a column label to begin the drag operation. Drag the column label to the desired location within the column labels and then release it to drop it at its new location.

During the drag operation the column label separators will provide visual feedback as to where the column will be positioned if released at that location.

© 2019-2025 Sumus Technology Limited

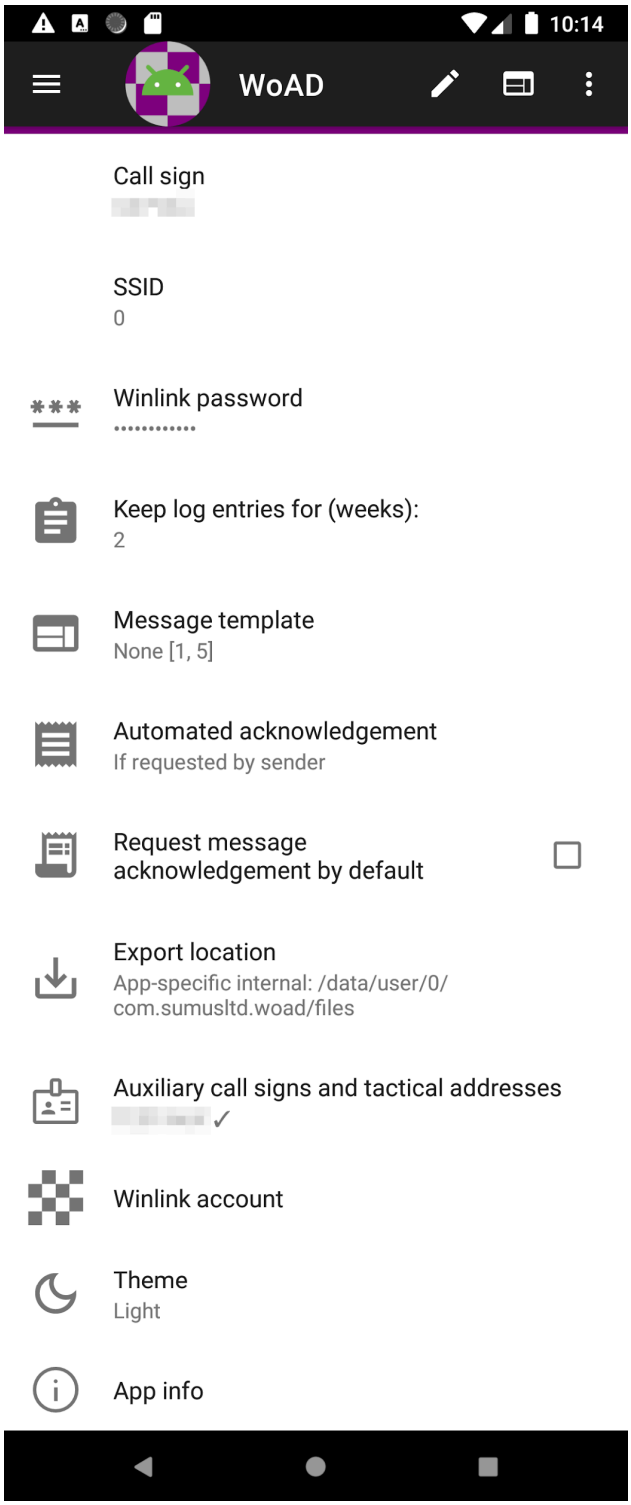
Sizing:

A column’s width can be changed using a pinch gesture. Press and hold a column label to begin the size operation. Then press and drag with a second finger, to either the left or right of the first finger, to change the column’s width.

You can have different column widths depending on the orientation of your device, allowing you to take full advantage of the screen width in each orientation.

© 2019-2025 Sumus Technology Limited

Settings



© 2019-2025 Sumus Technology Limited

Call sign

Your personal or site call sign. The call sign must be 6 or fewer characters.

SSID

An optional SSID, which, if specified, must be a number between 1 and 15. Note that if you specify an SSID then messages addressed to you must include the SSID, *e.g.* if your call sign is N2ASD and the SSID is set to 5 then messages must be addressed to N2ASD-5.

If you are unsure whether or not you should set an SSID, then you almost certainly shouldn't.

Winlink password ***

Your case-sensitive Winlink password. This is not necessary if you are going to make only P2P connections.

Keep log entries for (weeks)

Log entries will be automatically deleted once they reach the specified age. If you wish to retain the logs for a longer period you should save them to a file at least as often as the specified period.

Message template

Message templates provide a mechanism to automatically pre-populate selected fields within a message. Templates can only request input from the user via dialogs or HTML forms.

Other templates location

A folder that can be used to store templates in addition to the standard templates, which are included with WoAD.

Default message templates

A configurable list of default message templates. Clicking on a particular template, *e.g.* **Template [2]**, will allow the selection of a default message template. By default **none** is selected. 🗀 represents a template folder, containing template files, and represents a template file, which can be selected. After selecting the desired template file press **OK**, or press **CANCEL** to retain your current template.

© 2019-2025 Sumus Technology Limited

Form data location

A folder that can be used to save form data and load form data from. Many of the standard templates offer the ability to save and load form data to and from a file.

Sequence number

The sequence number can be inserted into a message template using the `<seqnum>` tag. Refer to the Message Template Reference for further information.

Sequence number length

When the sequence number is inserted it will be leading-zero padded to ensure it is at least as long as the specified sequence number length.

Standard templates version

A read-only value giving the version of the standard templates that are included with WoAD.

Automated acknowledgement

This allows you to specify how WoAD should acknowledge incoming messages. The options are:

- **Never** - no incoming message will be automatically acknowledged, but you can still acknowledge messages manually
- **If requested by sender** - only incoming messages where the sender has requested an acknowledgement will be automatically acknowledged. Other messages can be acknowledged manually
- **Always** - all incoming messages will be automatically acknowledged

Request message acknowledgement by default

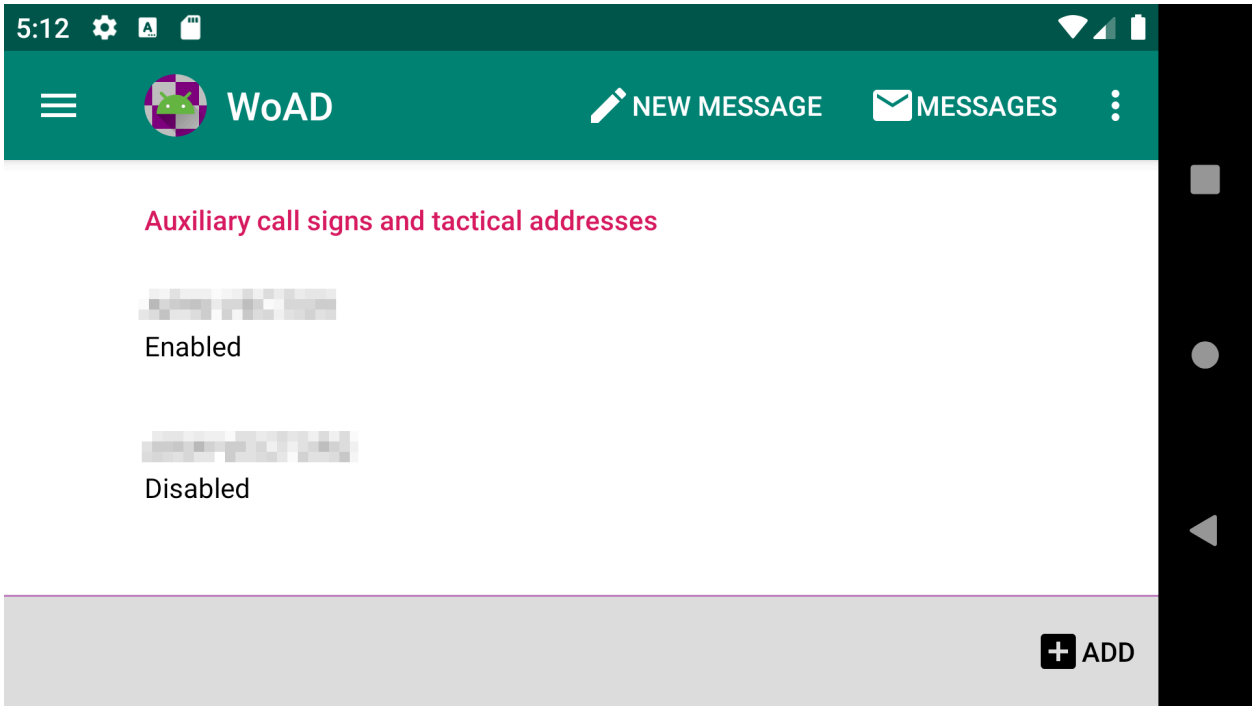
If checked your message will, by default, include a request that an acknowledgement be sent, although the receiver can choose to ignore the request. This setting can be overridden for each message.

© 2019-2025 Sumus Technology Limited

Export location

Specifies the location to save exported files. Refer to Export for further information. This setting may not be configurable, depending on the version of Android that you are running.

Auxiliary call signs and tactical addresses



An auxiliary call sign:

- is a normal Winlink call sign account.used as a secondary address for receiving messages. When a connection is made any pending incoming messages for the primary or enabled auxiliary call sign(s) will be received

A tactical address:

- is used as a functional email account rather than an account of a specific individual
- must be between 3 and 12 characters in length and consist of alphabetic characters, together with alphanumeric characters following a single optional dash (which cannot be one of the first 3 characters)
- does not require a password, though it is strongly recommended

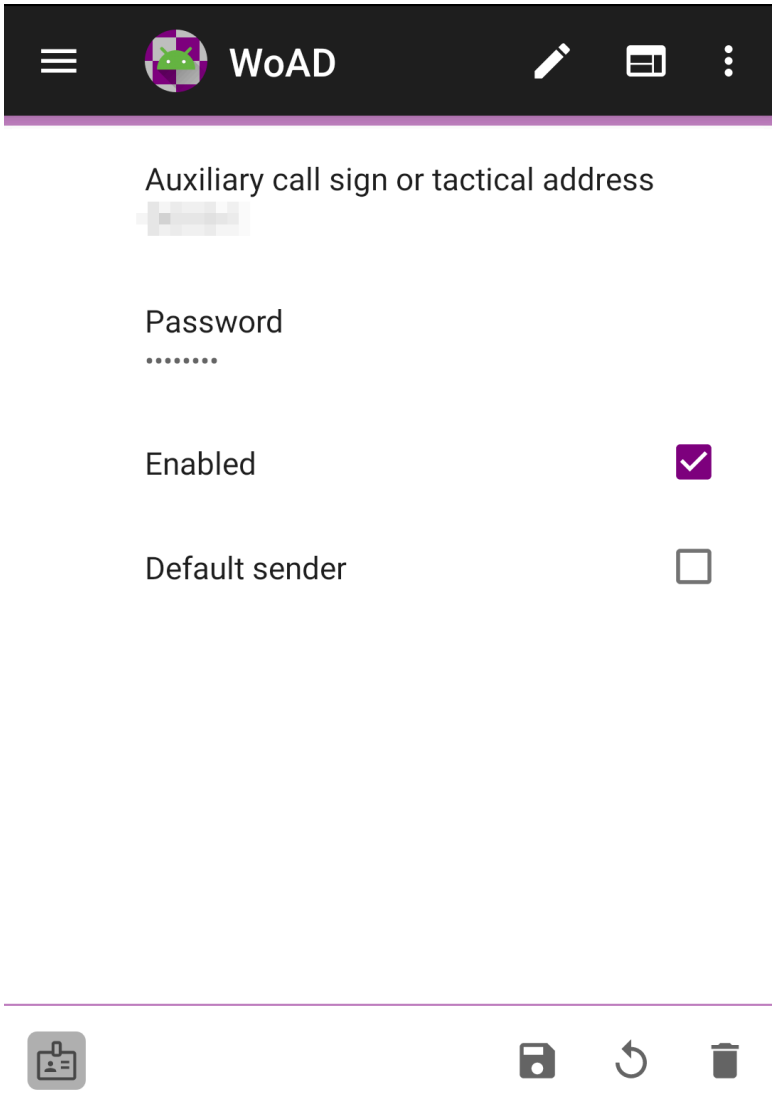
© 2019-2025 Sumus Technology Limited

- can only be created through Winlink Express. Specific information about the tactical address must be supplied through the Winlink web interface.

Menu

Add

Add an auxiliary call sign or tactical address.



Fields

© 2019-2025 Sumus Technology Limited

Auxiliary call sign or tactical address: must be a valid call sign or tactical address

Password: the password associated with the auxiliary call sign or tactical address

Enabled: enable or disable the auxiliary call sign or tactical address. You may want to use a certain auxiliary call sign or tactical address only for specific events or times. This provides a mechanism to enable/disable the given call sign or address without having to create/delete it.

Default sender: If checked any messages created will have the From field set to this call sign or address. Only one call sign or address can have this flag set.

Menu

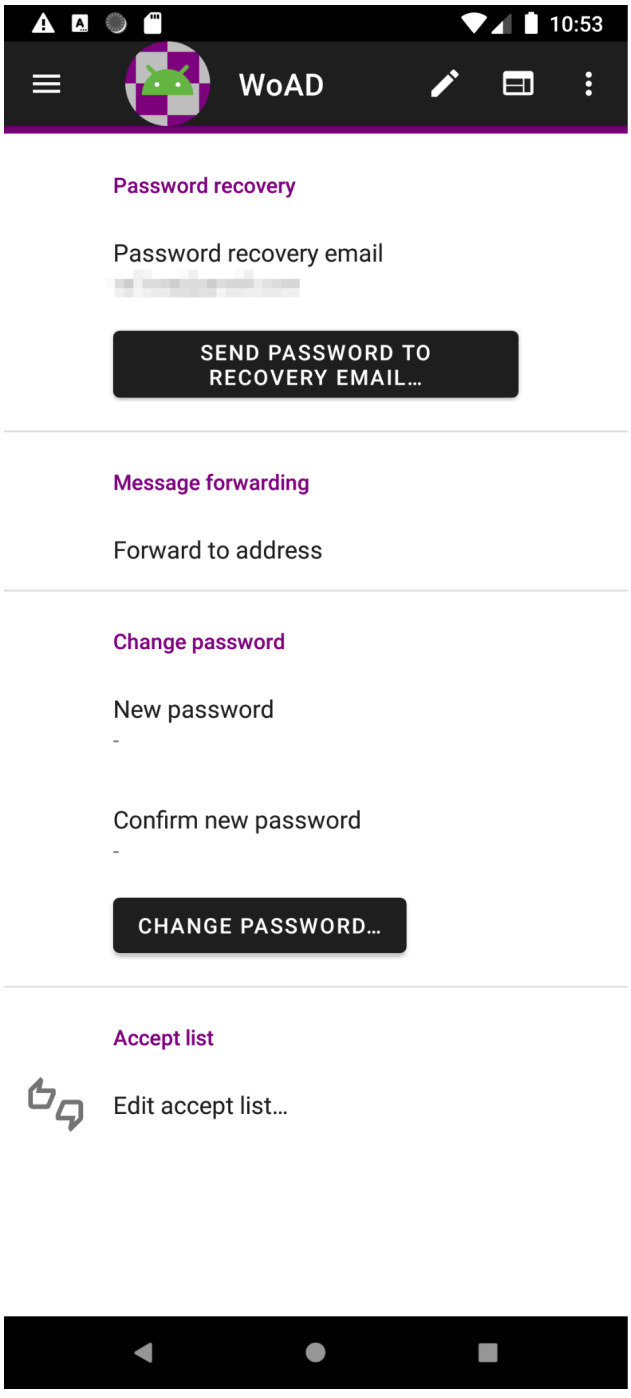
Save: save the current values

Reset: reset the current values

Delete: delete the auxiliary call sign or tactical address

© 2019-2025 Sumus Technology Limited

Winlink account



Allows configuration of several attributes of the Winlink account for the call sign given in the main Settings page.

© 2019-2025 Sumus Technology Limited

This functionality requires an active internet connection: all the items will be disabled if there is no active internet connection.

In addition, if the call sign and password given in the main Settings page are not a valid combination then all of the items will be disabled with the exception of the “Send password to recovery email” button.

In addition, the password recovery, message forwarding, and accept list are each updated from the Winlink servers every time this page is accessed. Each item is enabled only after it has received the necessary response from the server. This may take a few seconds.

All of these settings, and more, can be modified at https://www.winlink.org/user

Password recovery

An email address, which should not be an @winlink.org address, where your Winlink password will be sent when requested.

Clicking on the “`send password to recovery email`“ button will request that a message be sent to your recovery email address. The message will be sent from SERVICE@winlink.org and will contain your current password.

Message forwarding

An email address to which messages received by your account will be forwarded. Set this to blank to disable forwarding and allow normal message delivery.

Change password

Allows changing of the password associated with the call sign given in the main Settings page. The new password must be 6 to 12 characters in length containing any alphanumeric character (A-Z, a-z and 0-9) and any of the following symbols: **.!@#$%^&*()_.**

Once you have entered and confirmed the new password, clicking on the “`change password`“ button will make the necessary request to the Winlink servers. Once this request is confirmed the Winlink password in the main Settings page will be updated.

Accept list

© 2019-2025 Sumus Technology Limited

The accept list allows you to add, modify, or delete internet-based email addresses (address@domain.com) or entire domains (domain.com) to your anti-spam accept/reject list.

Theme

Specifies the theme for the app. The exact choices available will depend on the version of Android, but will include **Light** and **Dark**.

Dark theme, https://developer.android.com/guide/topics/ui/look-and-feel/darktheme, claims the following benefits:

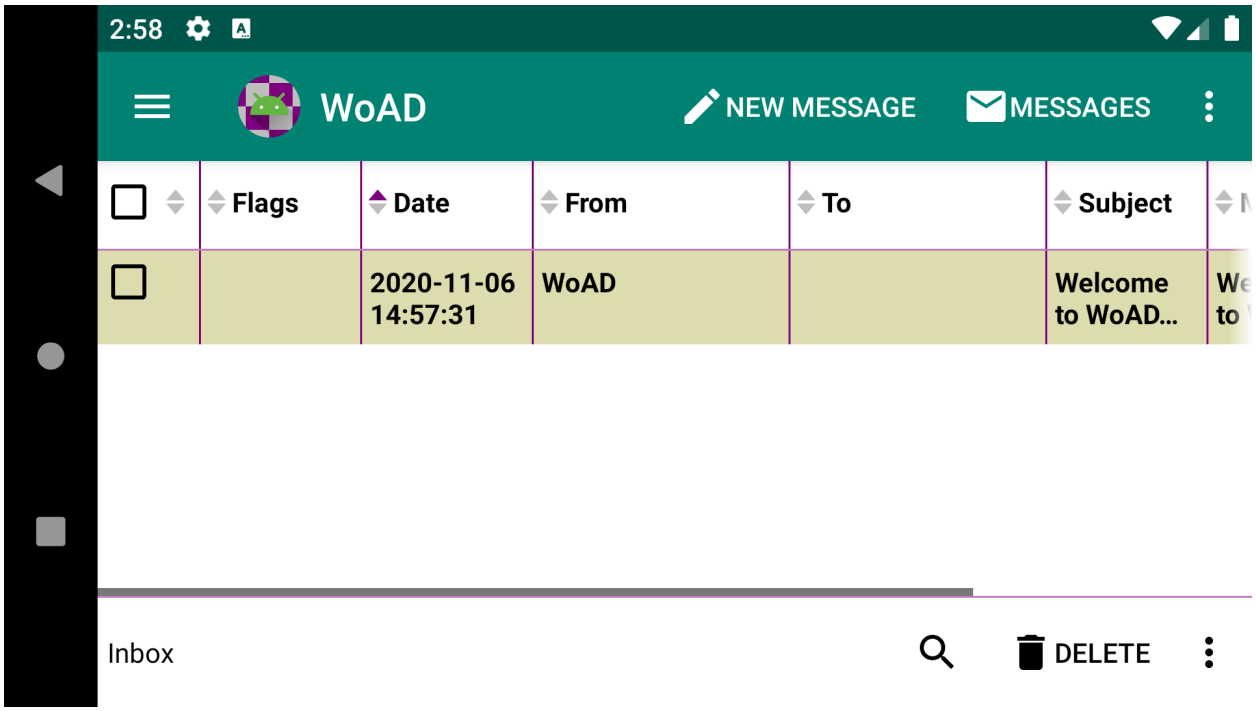
- Can reduce power usage by a significant amount (depending on the device's screen technology).
- Improves visibility for users with low vision and those who are sensitive to bright light.
- Makes it easier for anyone to use a device in a low-light environment.

App info

Launches the App info page for WoAD within Android.

© 2019-2025 Sumus Technology Limited

Messages



Columns

Checkbox

The checkbox allows a message to be selected/unselected. Several of the menu items will apply to all the selected messages, allowing multiple messages to be deleted, tagged, exported, marked as unread, *etc*.

Flags

The flags that apply to a message. Flags include:

- Precedence of priority, immediate, or flash respectively.
- Acknowledgement has been requested or received, respectively.
- Acknowledgement has been sent.
- Message has been forwarded or replied to, respectively.
- Message has attachments.

© 2019-2025 Sumus Technology Limited

- Message is read-only

Date

The date that the message was created.

From, To

The sender and the recipient of the message, respectively

Subject, Message

The message subject and body, respectively.

Id

The message identifier. For messages created within WoAD this is a random alphanumeric string 12 characters in length, *e.g.* `VIRHVAR6I7NQ`

Size

The size of the message in bytes. This gives the size of the message when it is compressed for transmission.

Menu

The actual menu items displayed will depend on the current folder.

Search

Search the messages within the current folder for the given text. The fields searched include the **From**, **To**, **Cc**, **Subject**, and **Message** fields. Only those messages that match the search text will be displayed.

Delete

Delete the selected message(s) by moving them to the **Trash** folder. This menu item is absent when in the **Trash** folder.

Delete forever

© 2019-2025 Sumus Technology Limited

Permanently delete the selected message(s). This menu item is present only when in the **Trash** folder.

Restore

Restore the selected message(s) to the folders they were present in at the time of their deletion. This menu item is present only when in the **Trash** folder.

Archive

Archive the selected message(s) by moving them to the **Archive** folder. This menu item is absent when in the **Outbox, Trash**, **Drafts**, **Partials**, and **Archive** folders.

Unarchive

Unarchive the selected message(s). The messages will be restored to the folders they were present in at the time of their archival. This menu item is present only when in the **Archive** folder.

Mark unread

Mark the selected message(s) as unread.

Tags…

Open the **Tags** screen to allow the selection of tags associated with the selected messages.

Export (eml)

Export the selected messages. The messages will be saved in MIME format to the export location. Each message will be saved to a file called `WoAD_message_<id>_<yyyy-MM-dd HH:mm:ss>.mime`, where `id`, `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the message id and the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_message_SK0AMZ9YD8Z4_2020-11-05 20_49_33.mime`.

Export (Winlink xml)

Export the selected messages. The messages will be saved in the Winlink messages xml format to the export location. All the messages will be saved to a single file called

© 2019-2025 Sumus Technology Limited

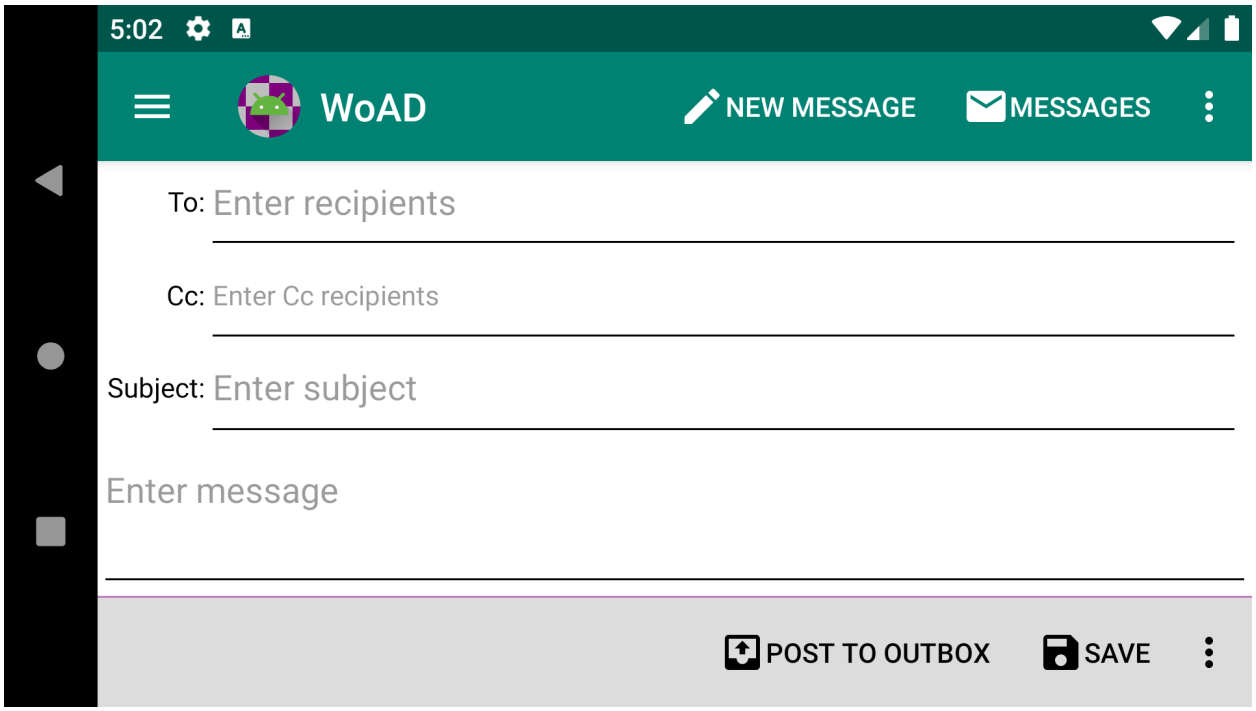
`WoAD_messages_<yyyy-MM-dd HH:mm:ss>.xml`, where `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_messages_2021-11-05 20_49_33.xml`

Import (Winlink xml)

Import the messages from the Winlink messages xml format file - which the user will be asked to select.

© 2019-2025 Sumus Technology Limited

New/Edit Message



Fields

To

List of recipients, separated by a space, comma, or semicolon. Each recipient can be a call sign, tactical address, or e-mail address.

Long clicking on the **To:** text field will launch the **Select contact** dialog, from which all the selected contact's addresses will be added to the **To** recipient list. Use the **Contacts…** lower menu item if you wish to add the contact's To and Cc addresses to the corresponding fields.

Cc

List of Cc recipients, separated by a space, comma, or semicolon. Each recipient can be a call sign, tactical address, or e-mail address.

Long clicking on the **Cc:** text field will launch the **Select contact** dialog, from which all the selected contact's addresses will be added to the **Cc** recipient list. Use the **Contacts…** lower menu item if you wish to add the contact's To and Cc addresses to the corresponding fields.

© 2019-2025 Sumus Technology Limited

Subject

Message subject.

Body

Message body.

Menu

Post to Outbox

Post the message to the Outbox.

Save

Save the message.

Delete

Delete the message by moving it to the **Trash** folder. This menu item is absent when the message is already in the **Trash** folder.

Delete forever

Permanently delete the message. This menu item is present only when the message is in the **Trash** folder.

Restore

Restores the message to the folders it was present in at the time of its deletion. This menu item is present only when the message is in the **Trash** folder.

Request acknowledgement

Toggle request acknowledgement. If checked your message will include a request that an acknowledgement be sent, although the receiver can choose to ignore the request. This will override the default setting.

© 2019-2025 Sumus Technology Limited

Attach

Add an attachment to the message.

Attachments...

Open the Attachments screen, which allows you to add, remove, view, and save attachments. This menu item is present only when there is at least one attachment to the message.

Tags…

Open the **Tags** screen, which allows you to add, remove, and edit the tags associated with a message.

Contacts...

Open the **Select contact** dialog, which allows selection of a contact to add to the message recipients.

Archive

Archive the message by moving it to the **Archive** folder. This menu item is absent when the message is in the **Outbox, Trash**, **Drafts**, **Partials**, **or Archive** folders.

Unarchive

Unarchive the message. The message will be restored to the folders it was present in at the time of its archival. This menu item is present only when the message is in the **Archive** folder.

Export

Export the message. See Messages export for further details.

Precedence

Set the message precedence: **Normal**, **Priority** ! , **Immediate** , or **Flash** . The default message precedence is **Normal**.

© 2019-2025 Sumus Technology Limited

From

Set the message sender. The default is the primary call sign, with all the enabled auxiliary call signs and tactical addresses also presented as options.

Copy to clipboard

Copy the message to the clipboard.

Print

Print the message. This option will be disabled on devices with versions of Android older than Android 4.4 (KitKat, API 19). For devices with Android 4.4 and newer the behavior may depend on the specific version of Android.

Header Position

Set when the position added to the message header, in the X-Location entry, is queried. This can be set to one of:

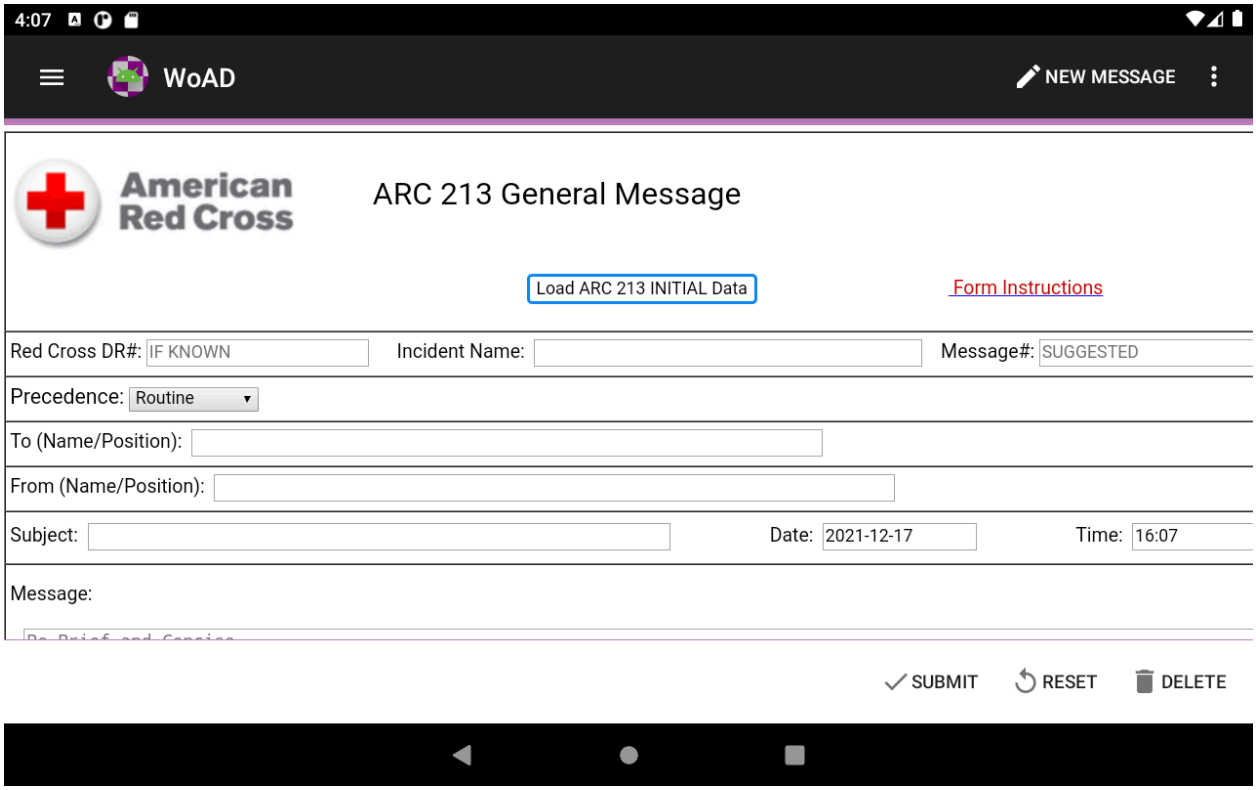
- **Add never**: no location entry is added to the message header
- **Add on create**: the position is queried at the time the message is created
- **Add on send**: the position is queried at the time the message is sent

The **Update :** requery the position when the header position is set to **Add on create**

Note that this is a “sticky” setting, in that the most recent configuration will apply to all subsequently created messages.

© 2019-2025 Sumus Technology Limited

New Message from Template



Menu

✓ Submit

Submit the form. If the form passes any validation checks it will then be closed and the standard **New Message** form will be displayed, pre-filled with the information provided in the HTML form.

Some templates may set the message's read-only flag to true, in which case you will be unable to edit the subject, message body, or attachments of the message.

Android versions 4.4.4 (API 19) and earlier may not respect the '**required**' attribute in form entries, in which case the form will validate and close even though one or more required values were left blank.

↺ Reset

Reset the contents of the HTML form to their initial values.

© 2019-2025 Sumus Technology Limited

Print

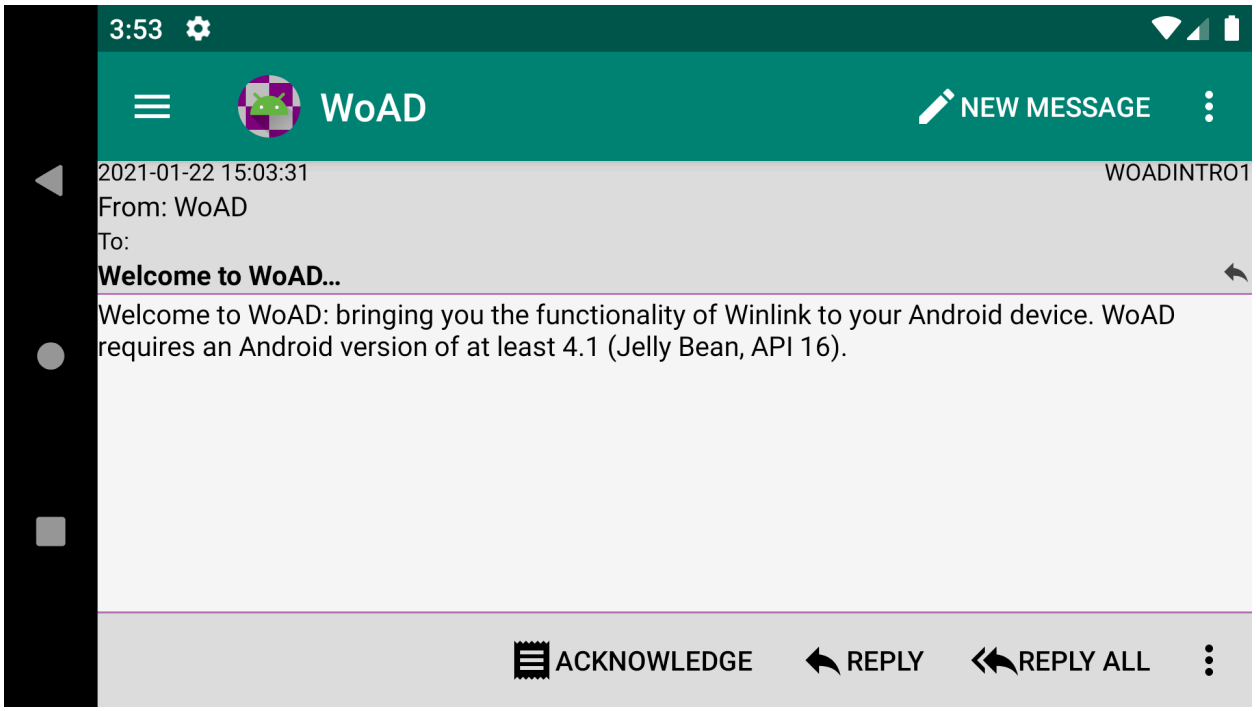
Print the form. This option will be disabled on devices with versions of Android older than Android 4.4 (KitKat, API 19). For devices with Android 4.4 and newer the behavior may depend on the specific version of Android. In particular some older versions of Android will not print the values entered into the form.

Delete

Delete the message currently being edited.

© 2019-2025 Sumus Technology Limited

View Message



Menu

Acknowledge

Send an acknowledgement receipt, letting the sender of the message know that it has been received.

Reply

Reply to the message. The **To** field of the new message will contain the sender of the original message.

Reply All

Reply to the message. The **To** and **Cc** fields of the new message will contain the sender and recipients of the original message.

© 2019-2025 Sumus Technology Limited

Forward

Forward the message.

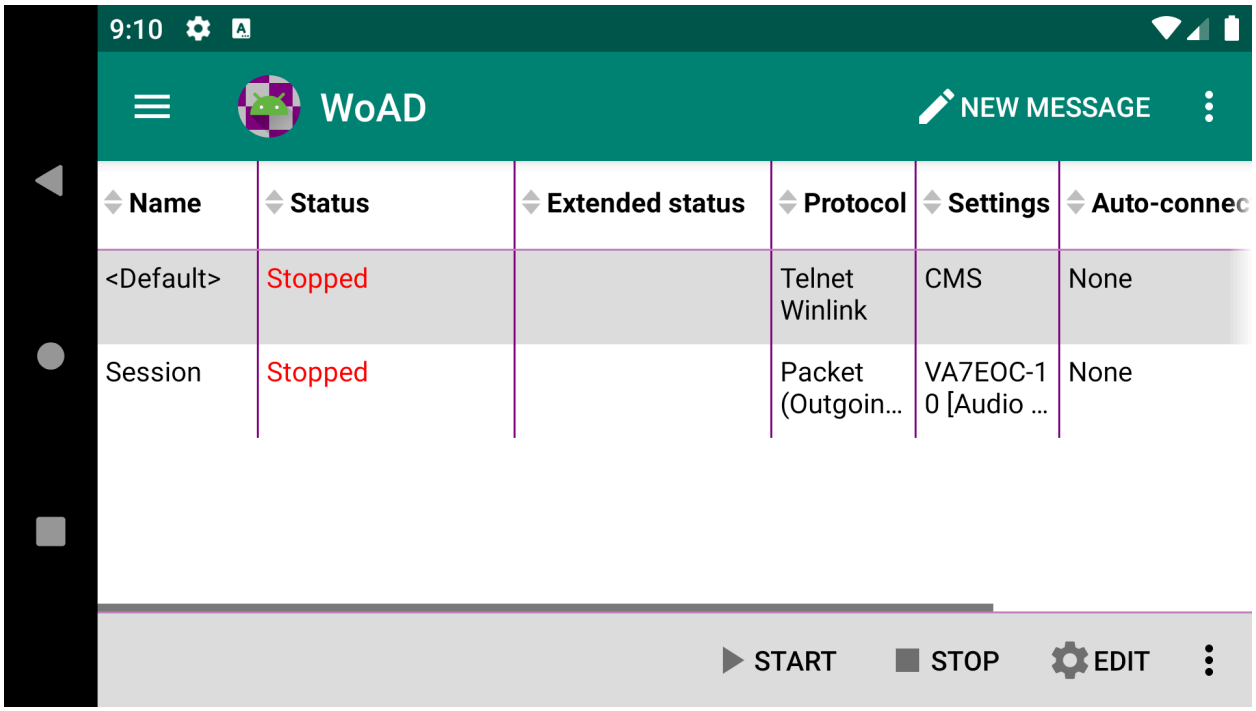
Mark unread

Mark the message as unread.

Other menu items (**Delete,** **Delete forever,** **Restore,** **Attachments…** **Tags…** **Archive,** **Unarchive,** **Export,** **Copy to clipboard,** **Print**) are described in the Menu section of New/Edit Message.

© 2019-2025 Sumus Technology Limited

Sessions



A session is the mechanism through which messages are sent from and received by WoAD. Each session can be configured by the user to connect to a remote Winlink server or peer, allowing for the exchange of messages.

A session can be in one of four states, indicated by the **Status** column:

- **Running**
- **Stopping**: The session is transitioning out of the **Running** state. Depending on the session protocol a session may remain in this state for only a very brief interval
- **Waiting**: The session has an auto-connect interval specified and is waiting for the **Next connect** time, when it will be automatically started
- **Stopped**

Columns

Name

The name given to the session.

Status

© 2019-2025 Sumus Technology Limited

The session's status. This is one of: **Stopped**, **Running**, **Waiting**, or **Stopping**

Extended Status

The session's extended status, which gives a brief description (*e.g.* Initial exchange, Sending messages, Receiving messages, *etc.*) when the session is running, as well as progress bars when receiving or sending messages. One bar shows the progress for the current batch of messages, while the other shows the progress for the individual message. The progress bars move from left to right when sending messages and right to left when receiving messages.

Protocol

The session protocol.

Settings

A summary of the session settings.

Auto-connect

A summary of the auto-connect session settings.

Next connect

If relevant the time that the session will be next automatically started. This will only be shown when the auto-connect interval has been set and the session is in the **Waiting** state.

Notes

Any notes assigned to the session.

Menu

Start

Start the selected session. This menu item will be disabled if no session is selected, or if the session is already **Running**.

Stop

© 2019-2025 Sumus Technology Limited

Stop the selected session. This menu item will be disabled if no session is selected, or if the session is already **Stopped** (or **Stopping**).

A **Running** session with an auto-connect interval set will enter the **Waiting** state if **Stop** is pressed, while a **Running** session with no auto-connect interval set will enter the **Stopped** state. Similarly, a **Waiting** session will enter the **Stopped** state if **Stop** is pressed.

Without auto-connect interval: ■ **Running:** → **Stopped**
With auto-connect interval: ■ **Running:** → **Waiting,** ■ **Waiting:** → **Stopped**

For some session protocols there may also be a discernible **Stopping** state, during which the session is politely terminated, usually involving a conversation with the remote end of the protocol. If **Stop** is pressed while in this state the session will be terminated abruptly and enter the **Waiting** or **Stopped** state, as described above.

Edit

Open the New/Edit Session screen to edit an existing session.

Add

Open the New/Edit Session screen to create a new session.

Copy

Create a copy of the selected session. The newly created session will be called **<Session> – Copy**, where **<Session>** is the name of the selected session that was copied.

In the event that there is already a session called **<Session> – Copy** then it will be called **<Session> – Copy (<n>),** where **<n>** is the smallest positive integer value that results in a unique session name.

Delete

Delete the selected session. A session can only be deleted when it is **Stopped**. This menu item will be disabled if no session is selected, or the selected session is not **Stopped**.

Refresh

© 2019-2025 Sumus Technology Limited

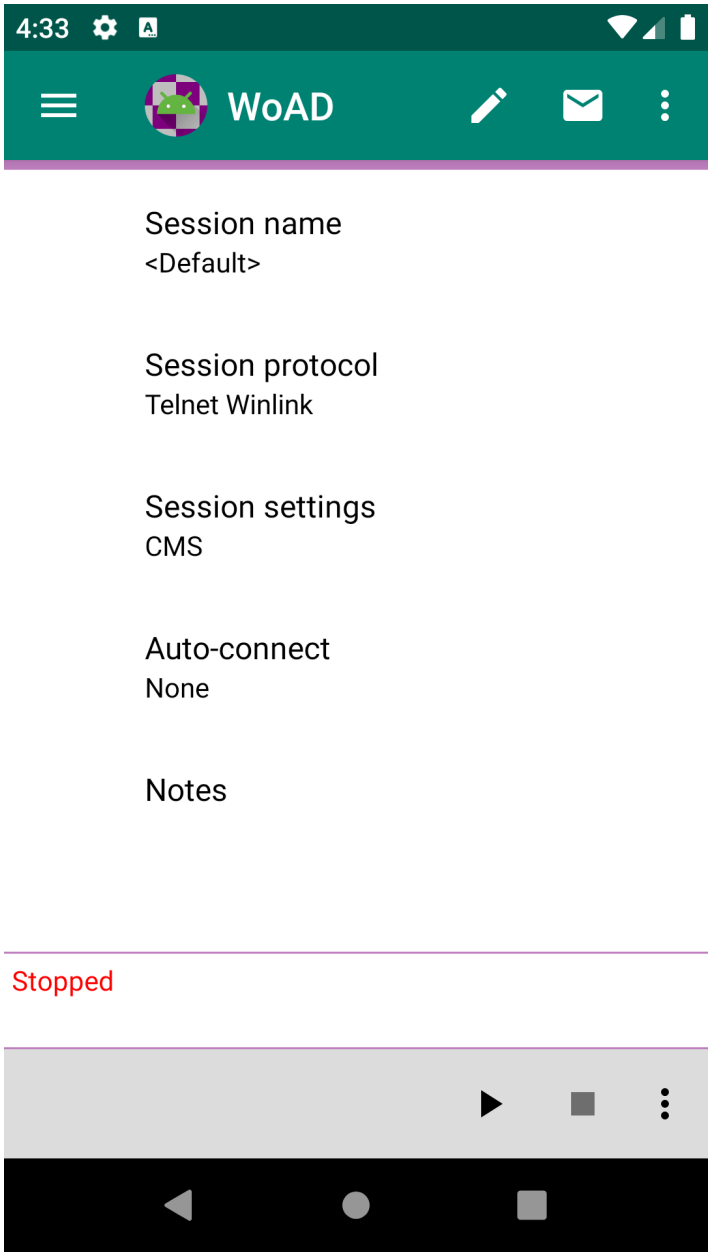
Refresh the list of sessions and their associated states. Under normal circumstances this should never be needed.

Export

Exports all sessions to an xml file. This is intended primarily for assistance with resolving connection problems. All the sessions will be saved in a single xml file to the export location. The file will be called `WoAD_sessions_<yyyy-MM-dd HH:mm:ss>.xml`, where `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_sessions_2021-11-05 20_49_33.xml`

© 2019-2025 Sumus Technology Limited

New/Edit Session



Menu

Start

Start the current session. This menu item will be disabled if the session is already **Running**.

© 2019-2025 Sumus Technology Limited

Stop

Stop the current session. This menu item will be disabled if the session is already **Stopped**.

Refer to the Stop entry in the Sessions screen for further detail.

Save

Save the current session.

Reset

Resets the current session's settings.

Export

Exports the session to an xml file. This is intended primarily for assistance with resolving connection problems. The session will be saved to the export location. The file will be called `WoAD_session_<yyyy-MM-dd HH:mm:ss>.xml`, where `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_sessions_2021-11-05 20_49_33.xml`

Delete

Delete the current session. The session must be **Stopped** for this menu item to be enabled. This will close the **Edit Session** screen and return you to the Sessions screen.

Settings

Name

The name of the session. The name must be unique.

Protocol

The protocol can be one of:

- Telnet Winlink
- Telnet P2P
- Packet
- ARDOP.1

© 2019-2025 Sumus Technology Limited

- VARA HF
- VARA FM

Type

The type will be one of:

- Outgoing - to make an outgoing connection
- Listener - to listen for incoming connection requests

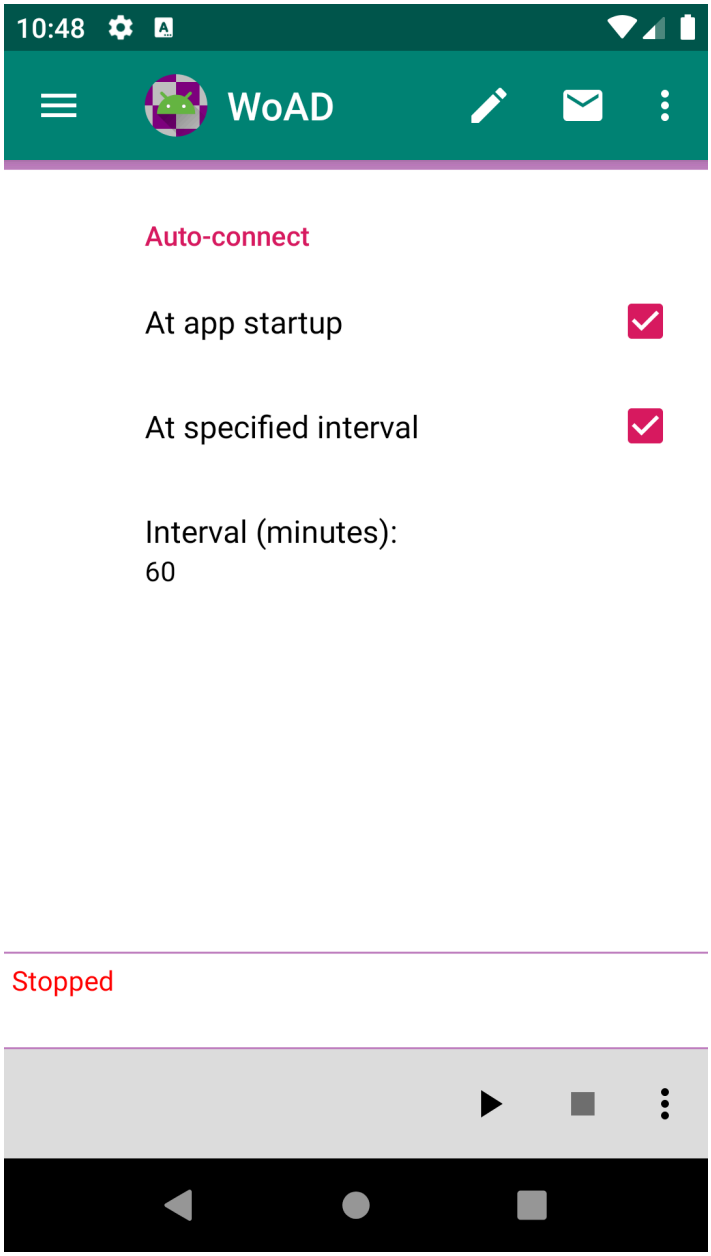
The type will disabled when the protocol is set to Telnet Winlink, as the Telnet Winlink protocol does not support incoming connections.

Settings

The session settings are contingent on the protocol selected. The settings are described in the Session Settings section.

Auto-connect

© 2019-2025 Sumus Technology Limited



At app startup

If checked the session will be automatically started when the app starts.

At specified interval
Interval (minutes)

If checked the session will be automatically started at the specified interval, in minutes, after entering the **Waiting** state.

© 2019-2025 Sumus Technology Limited

Note that the ‘at specified interval’ option is disabled for listener session protocols, as a listener session will remain running until stopped by the user.

Message transfer

Sets the behavior for the sending and receiving of messages when the session is running.

- **Send and receive**:
  - messages in the Outbox will be sent as normal
  - all incoming message proposals will be accepted.
- **Send only**:
  - messages in the Outbox will be sent as normal
  - all incoming message proposals will be held.
- **Receive only**:
  - no messages in the Outbox will be sent
  - all incoming message proposals will be accepted.

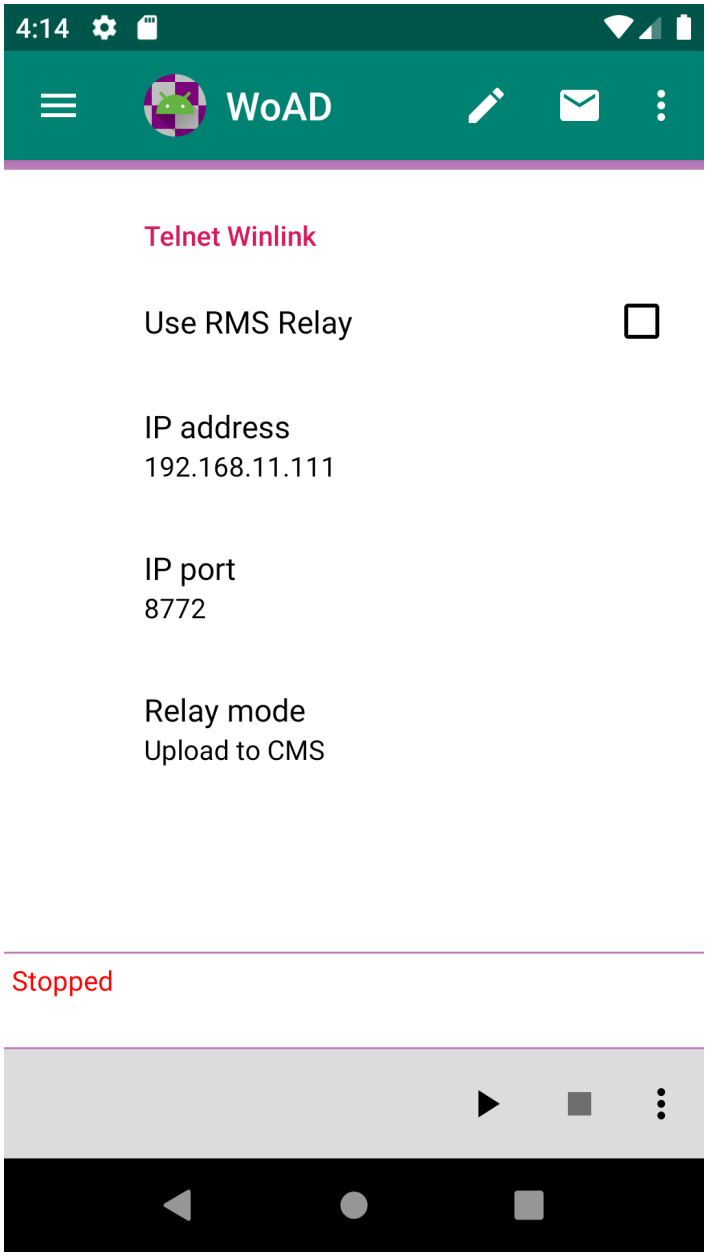
Notes

Notes assigned to the session.

© 2019-2025 Sumus Technology Limited

Session Settings

Telnet Winlink



Use RMS Relay

If checked, connects to an instance of RMS Relay, through the specified IP address and port. The following settings are enabled only if **Use RMS Relay** is checked.

© 2019-2025 Sumus Technology Limited

IP address
IP port

The IP address and port used to connect to RMS Relay.

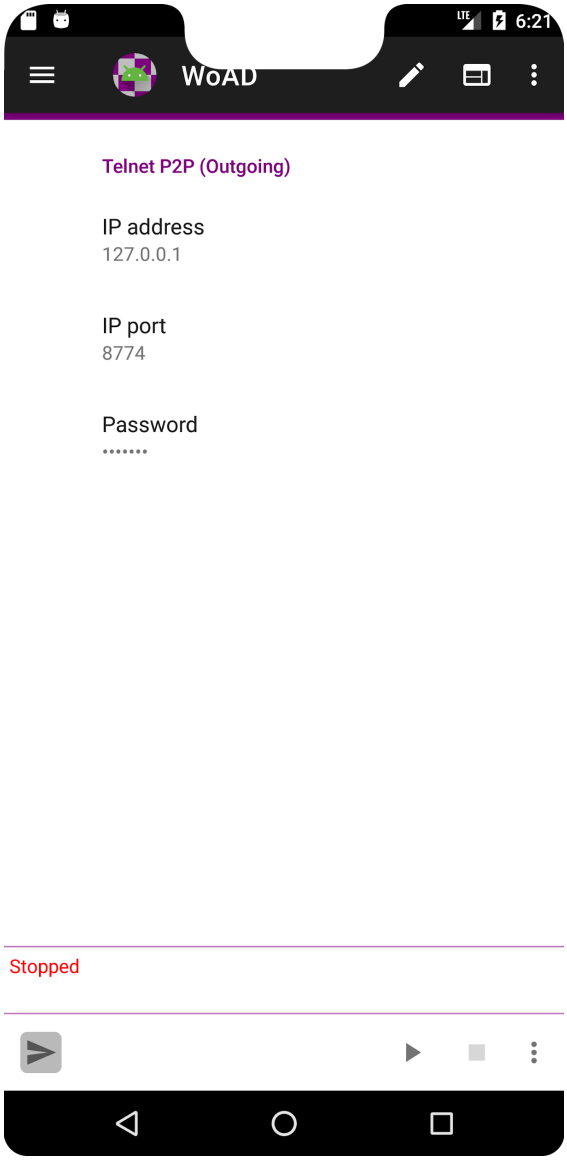
Relay mode

The **Relay mode** can be one of:

- **Upload to CMS**
  - The default behavior. RMS Relay passes the Telnet connection through to a CMS. Any messages sent go directly into a CMS database, and any pending messages being held by the CMS are received.
- **Use local message database**
  - RMS Relay will process the connection itself rather than passing it to a CMS; access is then to the local RMS Relay message database rather than a CMS database.
- **Send radio-only**
  - Any messages sent to RMS Relay will be forwarded radio-only through the Winlink Hybrid Network.

© 2019-2025 Sumus Technology Limited

Telnet P2P (Outgoing)



IP address
IP port

IP address and port of Winlink P2P-capable client.

Password

If the receiving station has a password it must be set here to establish a connection.

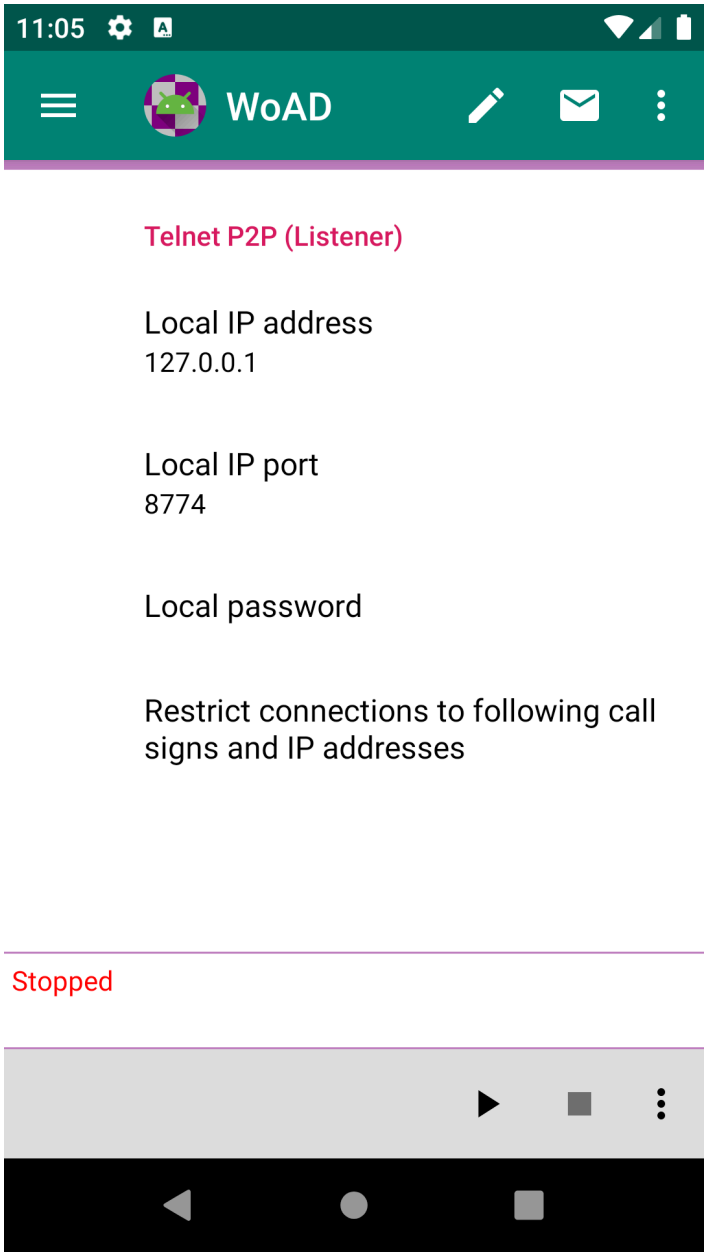
© 2019-2025 Sumus Technology Limited

Telnet P2P (Listener)

The **Telenet P2P (Listener)** session, once started, will run until stopped. It listens for incoming connections on the socket specified by the **local IP address** and **port**.

Once an incoming connection is accepted a new temporary session will be created which will handle the actual exchange of messages. The temporary session will be called **`<name> (<ip address>)`**, where **`<name>`** is the name of the existing listener session and **`<ip address>`** is the incoming IP address. The temporary session protocol will be **`Telnet P2P (Incoming)`**. The temporary session will be deleted once the message exchange completes.

© 2019-2025 Sumus Technology Limited



Local IP address
Local IP port

The local IP address and port on which the session will listen for incoming connections.

Local password

If a password is set here, any incoming connections will only be accepted if they provide the same password.

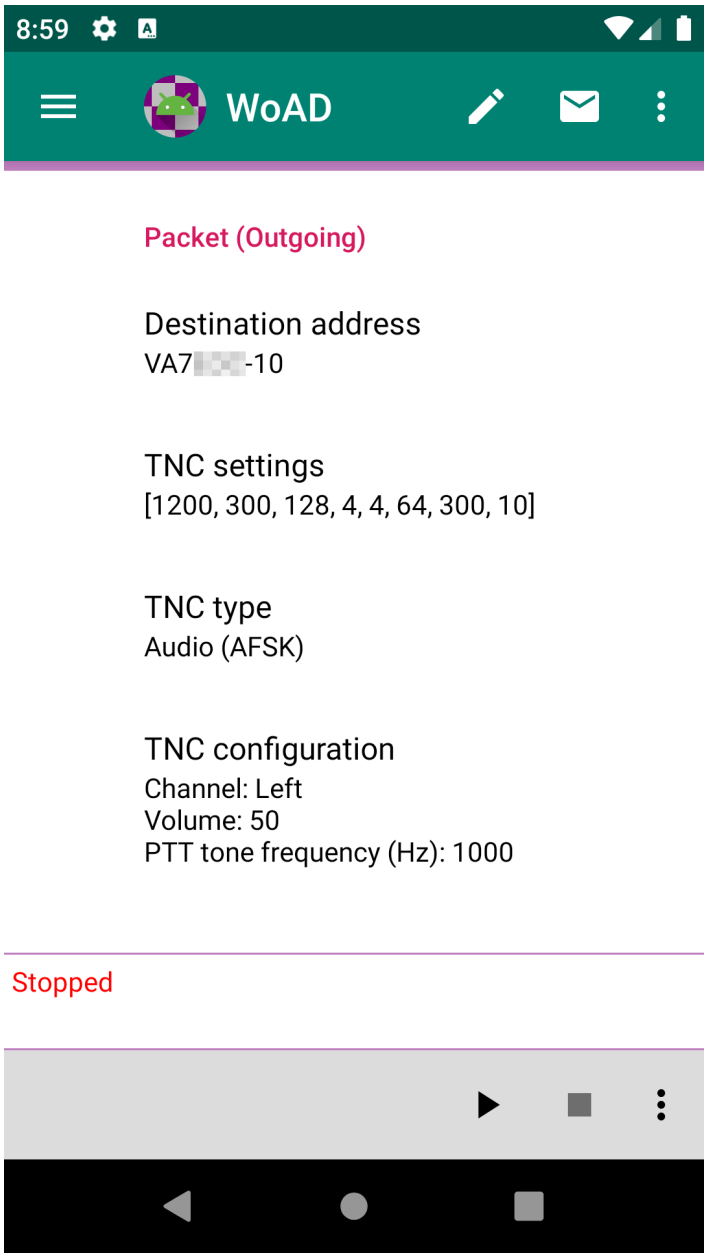
© 2019-2025 Sumus Technology Limited

Restrict connections to following call signs and IP addresses

If there are any entries here, then any incoming connections will be accepted only if they originate from the specified IP address or call sign.

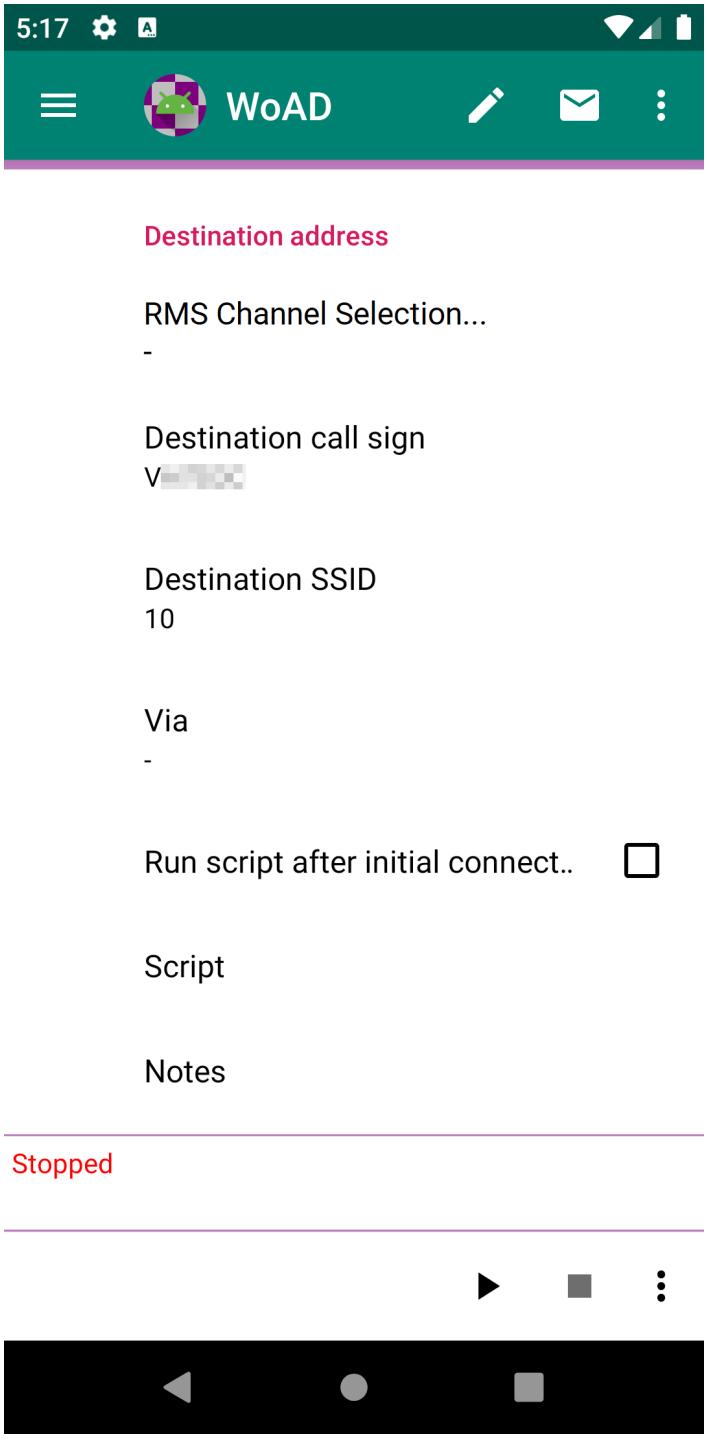
© 2019-2025 Sumus Technology Limited

Packet (Outgoing)



Destination address

© 2019-2025 Sumus Technology Limited



RMS Channel Selection…

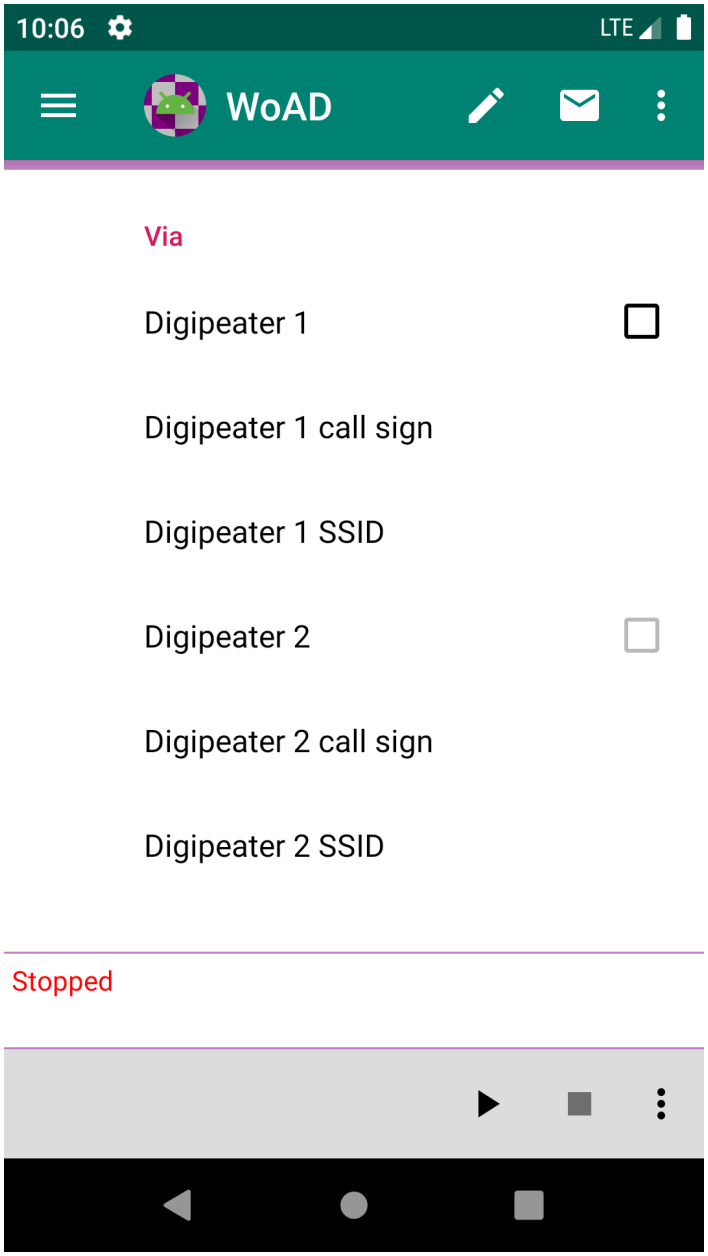
RMS Channel Selection provides a method to select the desired destination address from a list or map of RMS channels.

© 2019-2025 Sumus Technology Limited

Destination call sign
Destination SSID

Call sign and SSID of the destination.

Via



One, or two, digipeaters can be specified in order to reach the destination address.

© 2019-2025 Sumus Technology Limited

Digipeater 1 must be checked to enable the Digipeater 1 address settings and **Digipeater 2** checkbox. Similarly, **Digipeater 2** must be checked to enable the Digipeater 2 address settings.

Run script after initial connection

If checked the **script** will be used to guide the connection through the packet network.

Script
This setting will be enabled only if '**Run script after initial connection'** is checked.

A script can contain three different line types:

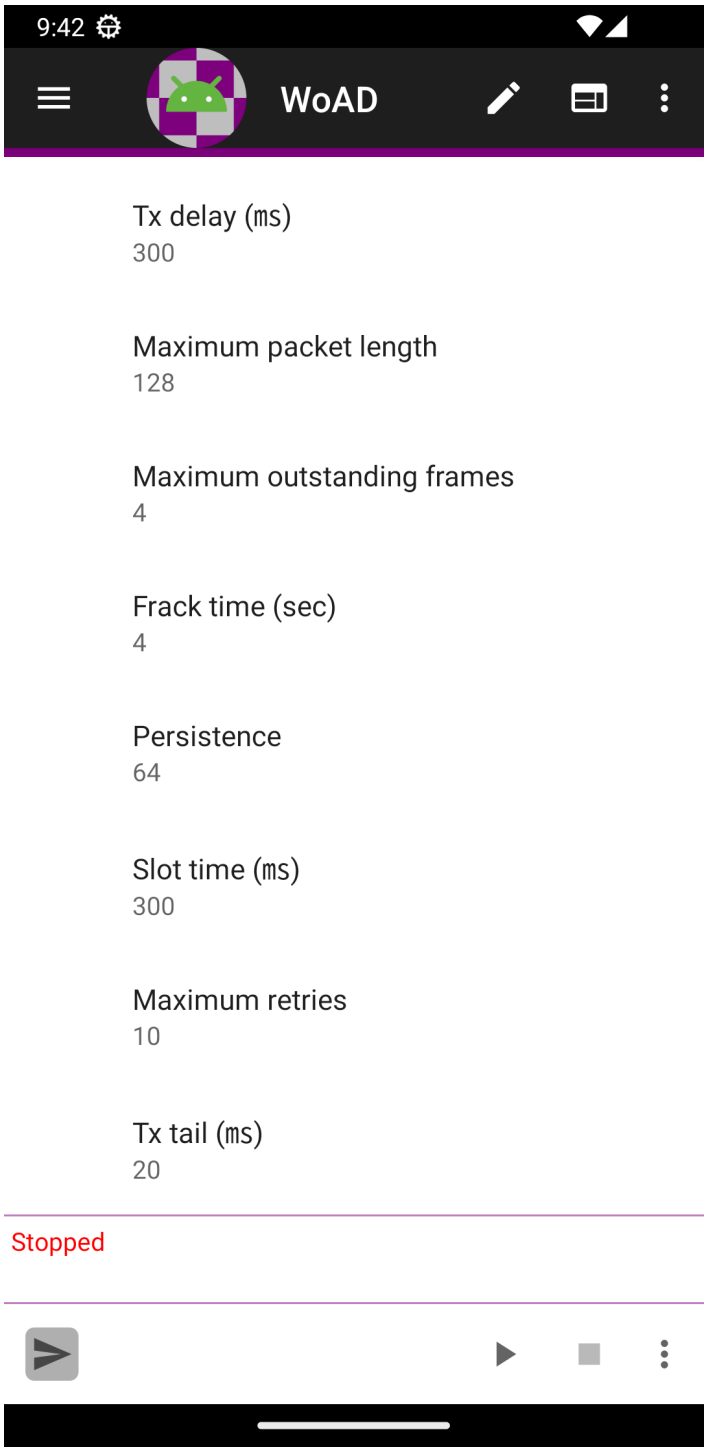
1. Command line: can appear anywhere in the script, begins with a '!' (exclamation point), and is optional: in their absence default values are used.
    a. `!CONNECTTIME` <seconds> — specifies the duration, in seconds, allowed for each connection through the network. The default value is 60.
    b. `!TOTALTIME` <seconds> — specifies the total duration, in seconds, allowed for the entire script to complete. The default value is 300.
    c. `!WAITFOR` <text> — specifies that the script is to wait until the specified text is found in the response from the server.
2. Response: the first non-command line is assumed to be the desired response from the specified **destination call sign**. The script will continue only when the specified response is found anywhere in the response from the packet node. Each subsequent response must be preceded by a connection request.
3. Connection request: a connection request to establish a link with the next node in the network *e.g.* `CONNECT VE1PKT`. The final connection request is assumed to terminate at either a Winlink CMS or P2P server, for which no response line is necessary. Note that the syntax of each connection request will depend on the node being communicated with.

Notes

Any notes that you want to associate with the script.

© 2019-2025 Sumus Technology Limited

TNC Settings



Tx delay (ms)

© 2019-2025 Sumus Technology Limited

Delay time, in milliseconds, to be reasonably certain that the transmitter has properly ramped up and is ready to transmit after being keyed, before any frames are sent. The HDLC flag (`0x7E`) is transmitted until the delay time expires.

Maximum packet length

The maximum size, in bytes, of the information field of a frame, excluding any inserted 0-bits.

Maximum outstanding frames

The maximum number of outstanding information frames permitted. An outstanding information frame is one that has been transmitted but remains unacknowledged.

For example, if `Maximum outstanding frames` is set to 4 then no further transmission of previously untransmitted information frames will occur until the number of unacknowledged frames is less than 4.

Higher numbers will give more throughput on quiet channels, while lower numbers will likely work better for congested channels.

Frack time (sec)

Nominal length of time to wait, in seconds, before retransmitting an unacknowledged frame.

Persistence
Slot time (ms)

The persistence and slot time, measured in milliseconds, work together to randomly delay stations before they begin transmitting after the channel becomes clear. This helps prevent several stations from beginning to transmit at the same time and causing collisions. The first transmission time slot is reserved for priority frames (acknowledgements and digipeat frames).

The process, on detection of a clear channel and following the first transmission time slot, is:

1. create a randomly generated number, in the range of 0 to 256, and compare it to the persistence value. If the former is the greater of the two then wait for an additional time slot interval and repeat step 1 else continue to step 2
2. start transmission of all the queued frames

If at any time during the process a busy channel is detected the process starts from the top.

This process causes transmission to be delayed for an exponentially-distributed random interval after sensing that the channel has become clear. With proper tuning of the **persistence** and

© 2019-2025 Sumus Technology Limited

slot time parameters, multiple stations waiting to transmit are less likely to experience collisions.

As the **persistence** value is increased and the **slot time** decreased the station becomes increasingly aggressive in its attempts to transmit. On a *dedicated channel* the **persistence** can be set to 256 to eliminate unnecessary transmission delays.

Maximum retries

The maximum number of times that an unacknowledged packet will be retransmitted before it is assumed that the connection has been lost.

For example, if `Maximum retries` is set to 2 then after the initial transmission of the packet without acknowledgement the retransmission of the packet will occur a maximum of 2 times. The connection will be considered lost if the packet remains unacknowledged after the retransmissions.

Tx tail (ms)

Time, in milliseconds, to continue the transmission after the last bit of data has been sent.

TNC type

The **TNC type** can be one of:

- Audio
- KISS

TNC configuration

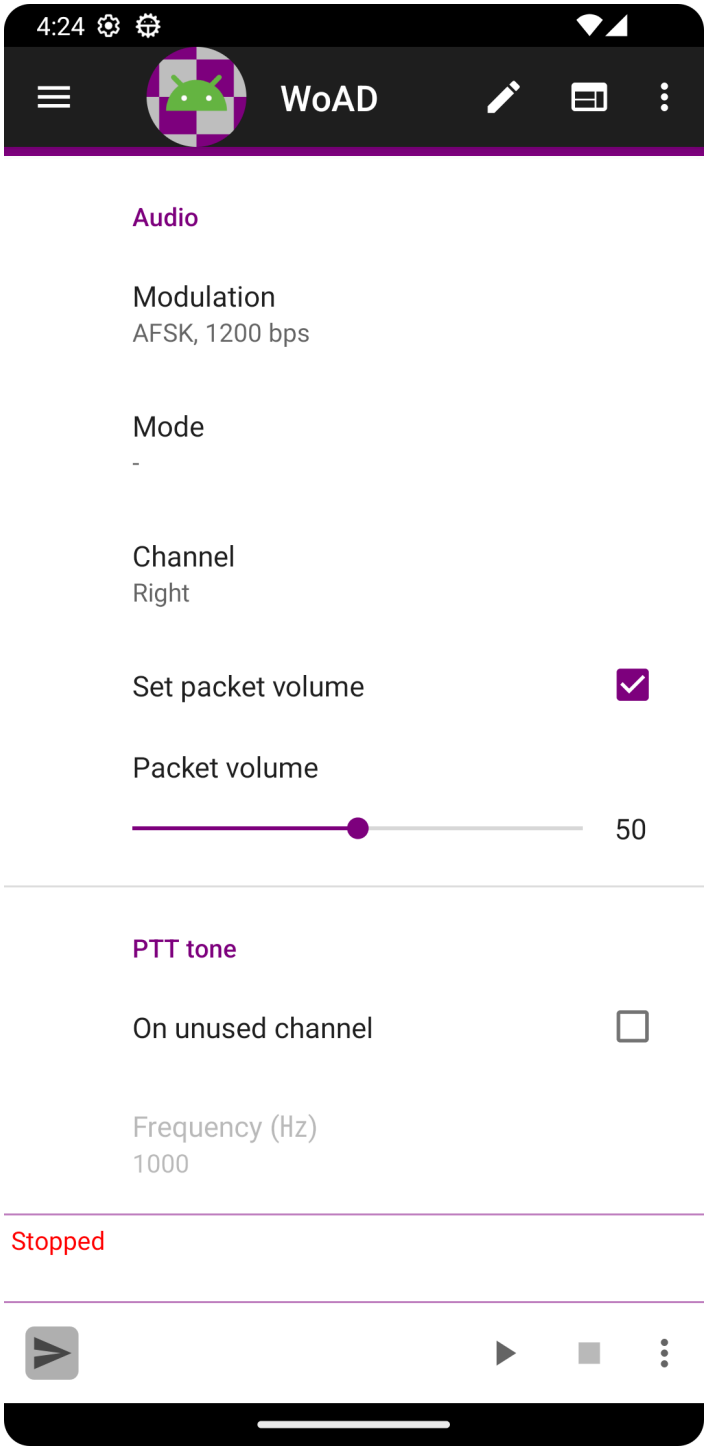
The **TNC configuration** options depend on the **TNC type** selected.

Audio

If using the Audio TNC it is important to keep in mind that only WoAD should be generating sound from the phone during an active session. You should put the phone in silent mode and close any other apps that may produce sound. This is to prevent unwanted signals from being transmitted over-the-air.

To ensure that the audio signal generated by WoAD is not distorted you should switch off any sound effects that may be available on your phone, such as, but not limited to, HD Audio, Dolby Atmos, *etc.*

© 2019-2025 Sumus Technology Limited



Audio

Modulation

© 2019-2025 Sumus Technology Limited

The most commonly used modulation is **AFSK, 1200 bps**, but WoAD supports other less commonly used modulations as well. The modulation should be set to match the remote end of the session.

It is important to understand that some modulations (with particular reference to FSK, 9600 bps) will not work if the audio signal is sent to (received from) the microphone (speaker) connection of a radio. Instead a direct connection to the radio's modulator (discriminator) is required - which is made available on some radios as a 'data' port, though the terminology is by no means standard across manufacturers. The reason for this is that the usual audio processing done by the radio will effectively distort the signal, rendering it indecipherable. This is avoided when using a 'data' port.

Mode

Set the transmission mode to either **simplex** or **duplex**. This setting must reflect the physical hardware being used. The default is **simplex**.

Channel

Set the audio channel(s) to use for the AFSK signal. This can be **right**, **left**, or **both**.

Set packet volume

Check to set the packet audio volume to the specified **packet volume**, else the volume used will be whatever the device is already set to.

Packet volume

The audio volume value to set.

PTT tone

A PTT tone can be optionally generated, which can be used, with the necessary electronic circuitry, to trigger the PTT of a radio. The tone is a sinusoidal signal of the specified **frequency**, in Hertz.

On unused channel

Check to use the unused audio channel for a sinusoidal signal which can be used to trigger the PTT. If the **channel** is set to **both**, then this is ignored.

Frequency (Hz)

© 2019-2025 Sumus Technology Limited

Set the sinusoidal PTT signal to the specified frequency, in Hertz.

Relative volume

If this value is

- ⩽ 1: the PTT tone volume will be set to the AFSK signal volume multiplied by this value
- > 1: the AFSK signal volume will be set to the PTT tone volume divided by this value

PTT USB RTS

This functionality requires that the Android device supports USB host mode, also known as On-The-Go (USB OTG). and that a USB serial adapter is plugged into the device. This functionality may not work with all USB serial adapters.

The USB RTS (Request to Send) can be asserted during periods of packet transmission. The signal generated can be used, with the necessary electronic circuitry, to trigger the PTT of a radio.

Enable

Check to assert the RTS of the USB port selected below

USB port

The USB port selected for.RTS assertion

PTT GPIO

A GPIO pin on CM108-based (and similar) USB sound cards can be driven high during periods of packet transmission. The signal generated can be used, with the necessary electronic circuitry, to trigger the PTT of a radio.

The audio controllers supported include:

- C-Media Electronics:
  - CM108
  - CM108AH
  - CM108B
  - CM109

© 2019-2025 Sumus Technology Limited

    - CM119
    - CM119A
    - CM119B
- Solid State System:
    - SSS1620
    - SSS1621
    - SSS1623

It should however be noted that the VID/PID of many of these audio controllers can be modified by the vendor, in which case they may not be recognized by WoAD.

Not all of the audio controllers listed support all of the GPIO pins listed in the WoAD interface (GPIO1 - GPIO8). On CM108-based sound cards GPIO3 is typically used as it is on the corner of the chip and so most easily accessible.

There are numerous descriptions on where to purchase or how to build a USB sound card to provide PTT control - the following terms “ptt usb soundcard gpio” or similar entered into your favored search engine should provide a representative selection.

Enable

Check to drive high the GPIO pin selected below during packet transmission

GPIO pin

The GPIO pin selected for PTT control

PTT USB CAT

This functionality requires that the Android device supports USB host mode, also known as On-The-Go (USB OTG). and that a USB serial adapter is plugged into the device. This functionality may not work with all USB serial adapters.

Some transceivers support a CAT interface, which allows various settings to be controlled remotely. For such devices that include control of the PTT via the CAT interface, the necessary commands to control the PTT can be configured in WoAD.

Enable

Check to send the ‘PTT on’ and ‘PTT off’ commands to the selected USB port

© 2019-2025 Sumus Technology Limited

USB Port

The USB port selected for.receiving of CAT commands

‘PTT on’ command
‘PTT off’ command

These commands will be manufacturer (and likely model) specific and should be described in your transceiver’s manual. Each command is entered as a hexadecimal string.

Configuration

If necessary allows for configuration of the USB port settings, including baud rate, data bits, stop bits, *etc*.

FX.25 FEC

FX.25 adds Forward Error Correction (FEC) to AX.25 packets while maintaining backward compatibility. The number of bytes that can be repaired is half the number of check bytes.

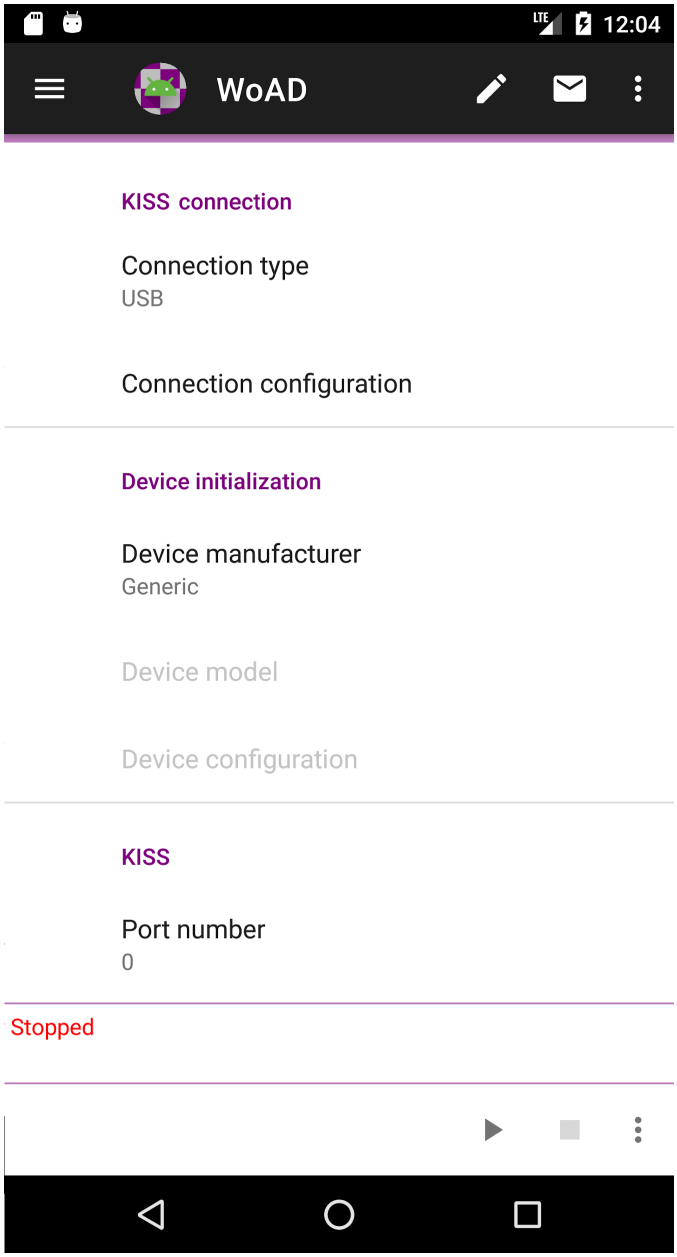
Transmission check bytes

Can be one of:

- None
- 16
- 32
- 64

Only the standard AX.25 packet is sent if set to **None**, or if there is insufficient room for the FX.25 framing. Otherwise, an FX.25 frame with the greatest possible number of parity check bytes (up to the specified number) will be sent.

© 2019-2025 Sumus Technology Limited



KISS connection

The KISS connection attempts to be as flexible as possible, allowing for a wide range of equipment and configurations to be supported. This should allow for direct connections to KISS-enabled radios, or the use of intermediary devices such as a Bluetooth-to-serial adapter.

© 2019-2025 Sumus Technology Limited

Connection type

Can be one of:

- **Bluetooth**
- **Bluetooth Low Energy (BLE)**
- **TCP/IP**
- **USB**

This must be set to reflect the type of connection made from the Android device, either directly to the radio, or to the initial intermediary device.

One or more of these options may be absent or disabled if the underlying technology is not supported by your device. In particular, not all devices support USB host (OTG) mode, Bluetooth, or BLE.

TIP: When working in KISS mode with a Kenwood TH-D74 you will also need to set, on the TH-D74, the Configuration → Interface → KISS (No. 983) menu function to USB or Bluetooth, to match the session configuration.

Connection configuration

The connection configuration will depend on the selected connection type:

- **Bluetooth**:

  Device

  Allows selection of the Bluetooth® device to communicate with from the paired devices.

  Settings…

  Launches the Android Bluetooth® settings screen. This can be used to pair with the desired device.

- **BLE** (Bluetooth Low Energy)

  This connection type is supported only for Android 5.0 (Lollipop) (API 21) and newer.

  Device

© 2019-2025 Sumus Technology Limited

Allows selection of the BLE device to communicate with from the scanned devices. If you have not already selected the desired device you must first “Scan for KISS BLE devices”.

Scan for KISS BLE devices
Scans for BLE devices that comply with the specification for KISS over BLE (Bluetooth Low Energy) as described at https://github.com/hessu/aprs-specs/blob/master/BLE-KISS-API.md. Pressing while scanning is in progress will terminate the scan, else the scan will terminate automatically after a set interval.

Settings…

Launches the Android Bluetooth® settings screen

- **TCP/IP**:
  IP address
  IP port

  The IP address and port used to connect to the internet-enabled device.

- **USB**:
  In order to communicate with a radio or modem via your Android device’s USB connection, the Android device must support USB host mode, also known as On-The-Go (USB OTG).

  USB port

  The USB port to which the radio (or intermediary device) is attached. If one or more suitable devices are found the entries will be something like:
  `Silicon Labs: CP2102 USB to UART Bridge Controller [/dev/bus.usb/001/002]`

  Use device settings

  If checked the device selected (see device initialization) will be initialized appropriately based on its known settings and specified configuration values. Otherwise the specified serial configuration properties (baud rate, data bits, stop bits, parity, DTR, and RTS) will be used.

Device initialization

© 2019-2025 Sumus Technology Limited

This allows the opportunity to set additional parameters for a limited range of devices, such as the band, packet transfer rate, power level, *etc*.

Device manufacturer

Select the manufacturer of the device to be initialized. Unless you are connecting directly to a listed device manufacturer and model this should be left at **Generic**.

Device model

If applicable, select the particular model produced by the selected manufacturer.

Device configuration

The configuration settings, if any, will depend on the choice of manufacturer and model.

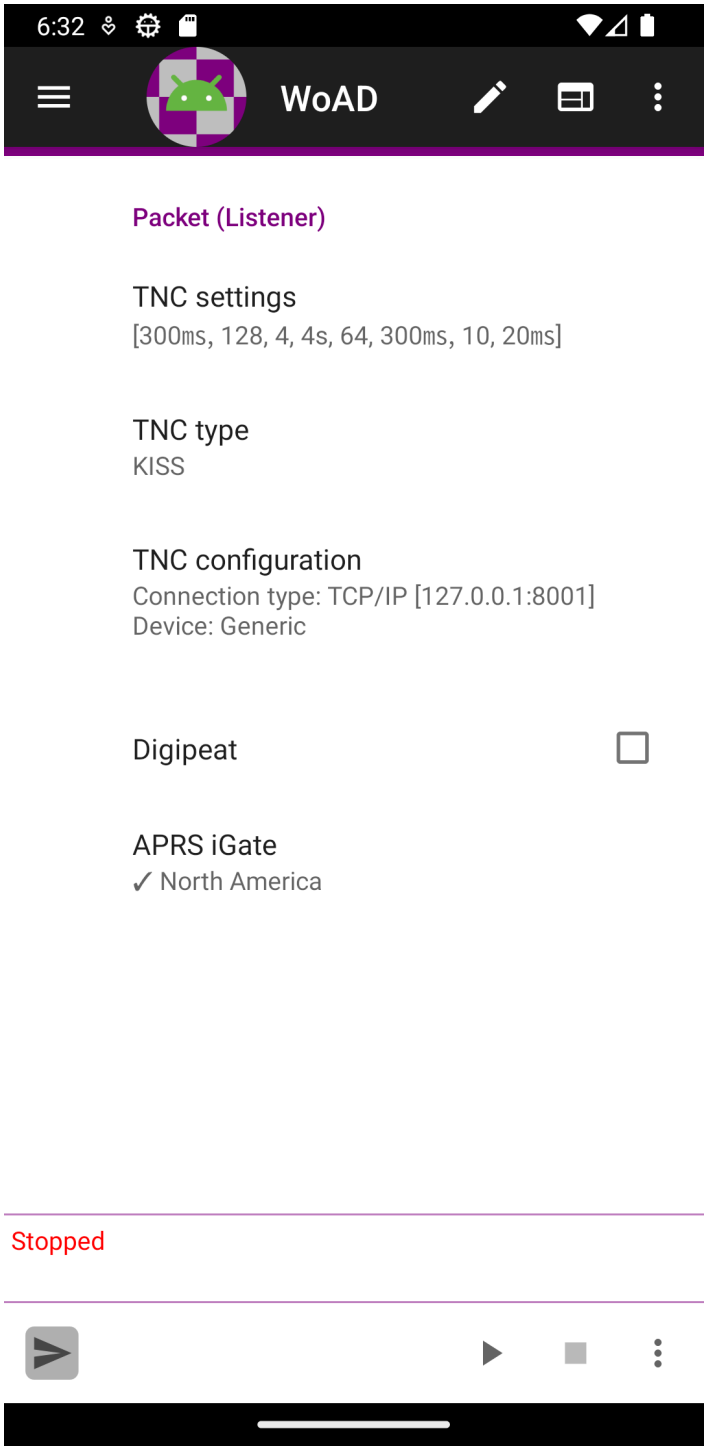
KISS

Port number

The default value of 0 should only be changed if you are using an intermediary KISS routing device. If you are unsure whether you need to modify this value then you shouldn't: leave it at the default of 0.

© 2019-2025 Sumus Technology Limited

Packet (Listener)



The **Packet (Listener)** session, once started, will run until stopped. It listens for incoming connection requests on the interface specified.

© 2019-2025 Sumus Technology Limited

Once an incoming connection is accepted a new temporary session will be created which will handle the actual exchange of messages. The temporary session will be called **<name> (<call sign>)**, where **<name>** is the name of the existing listener session and **<call sign>** is the call sign of the incoming connection**.** The temporary session protocol will be `Packet` **(Incoming)**. The temporary session will be deleted once the message exchange completes.

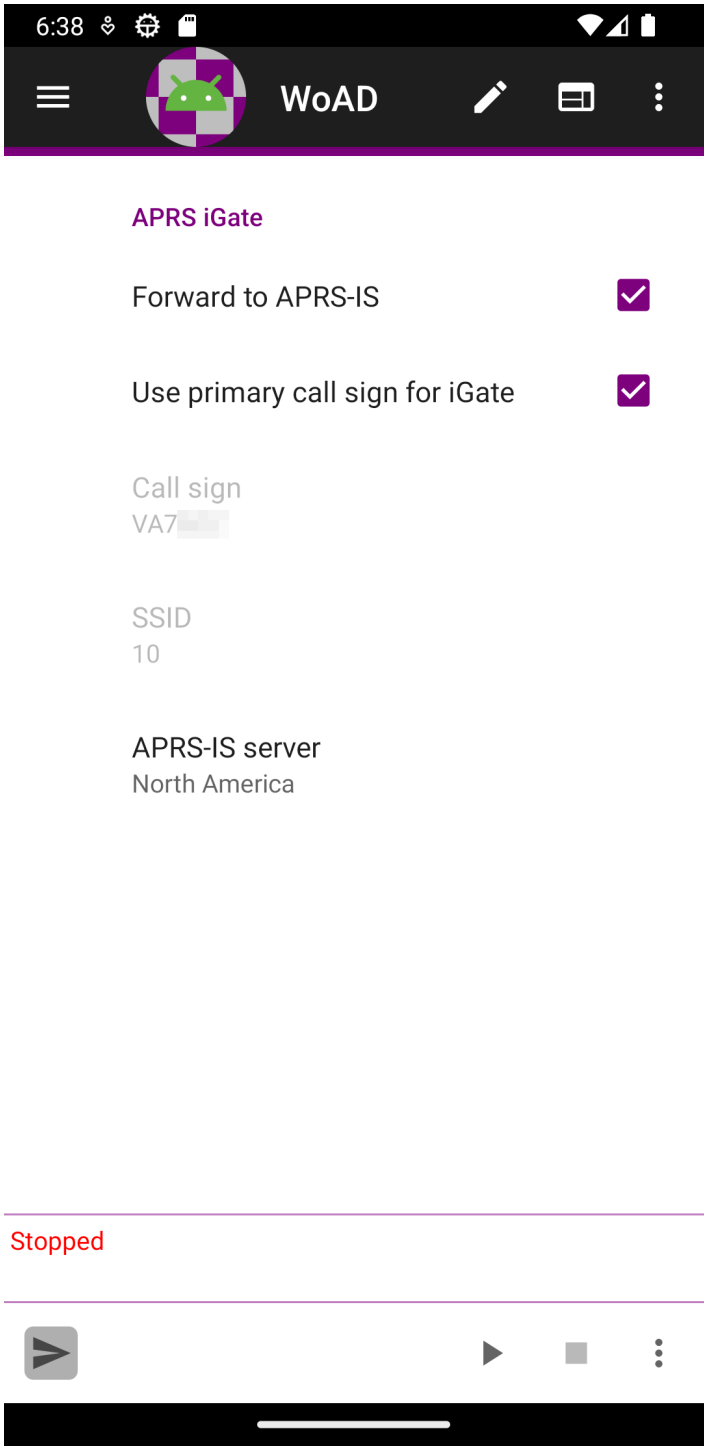
The settings for the **Packet (Listener)** are the same as for the **Packet (Outgoing)**, except that in the former the **destination address** is not present and **digipeat** and **APRS iGate** have been added.

Digipeat

> If enabled then AX.25 packets will be digipeated. This functionality is not designed to work with the automatic forwarding of APRS packets. It is strongly recommended that you only enable this option if you have a good understanding of digipeating.
>
> This functionality lies outside of the core focus of WoAD

APRS iGate

© 2019-2025 Sumus Technology Limited



The APRS iGate allows incoming APRS packets to be forwarded to the APRS-IS. More information on this service can be found at https://www.aprs-is.net/.

Packets where the via fields are any of the following will not be forwarded to the APRS-IS: **RFONLY**, **NOGATE**, **TCPIP**, **TCPXX**

© 2019-2025 Sumus Technology Limited

Packets where the source address starts with any of the following will not be forwarded to the APRS-IS: **WIDE**, **RELAY**, **TRACE**, **TCPIP**, **TCPXX**, **NOCALL**, **N0CALL**

It is strongly recommended that you only enable this option if you have a good understanding of APRS and the APRS-IS in particular.

This functionality lies outside of the core focus of WoAD

Forward to APRS-IS

If enabled any incoming APRS packets will be forwarded to the APRS-IS.

Use primary call sign for iGate

If this option is enabled then the call sign and SSID configured in the Settings is used when forwarding APRS packets to the APRS-IS, else the call sign and SSID configured below are used.

Call sign
SSID

If '**use primary call sign for iGate'** is disabled then the call sign and SSID to use when forwarding APRS packets to the APRS-IS.

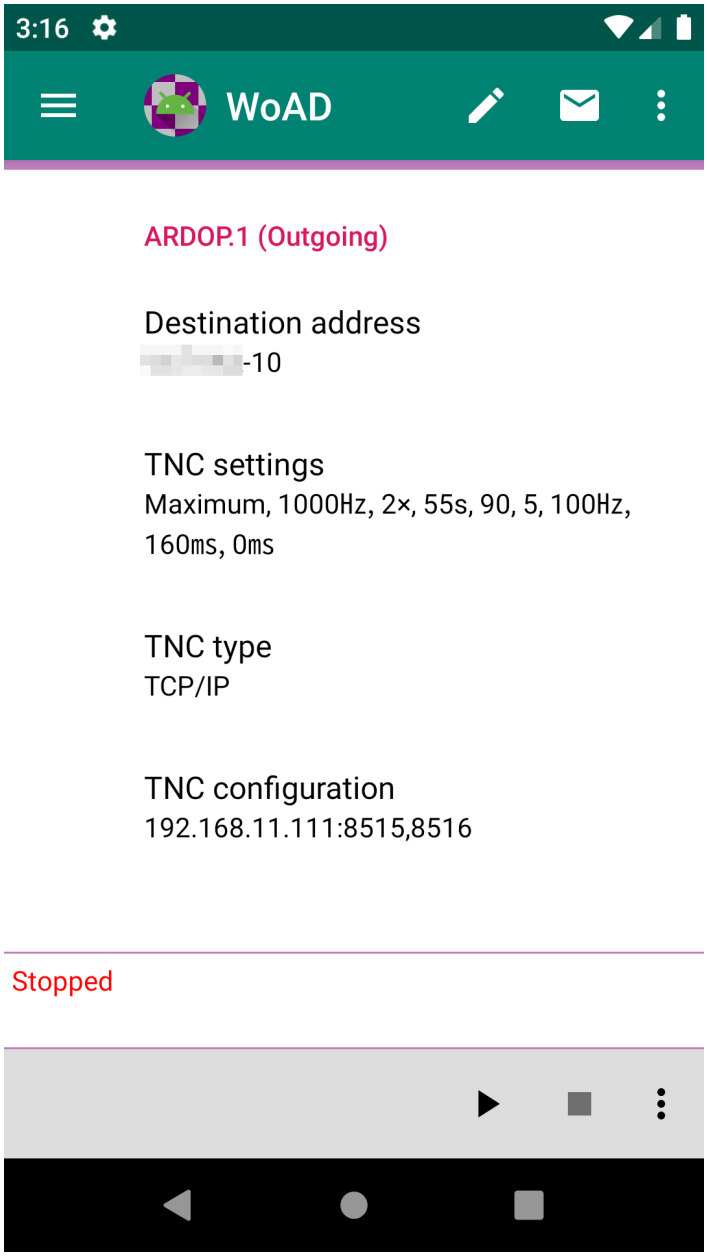
APRS-IS Server

The APRS-IS server to forward packets to. It is customary to select the region covering your current location.

Packets are forwarded using the UDP protocol in order to reduce network bandwidth.

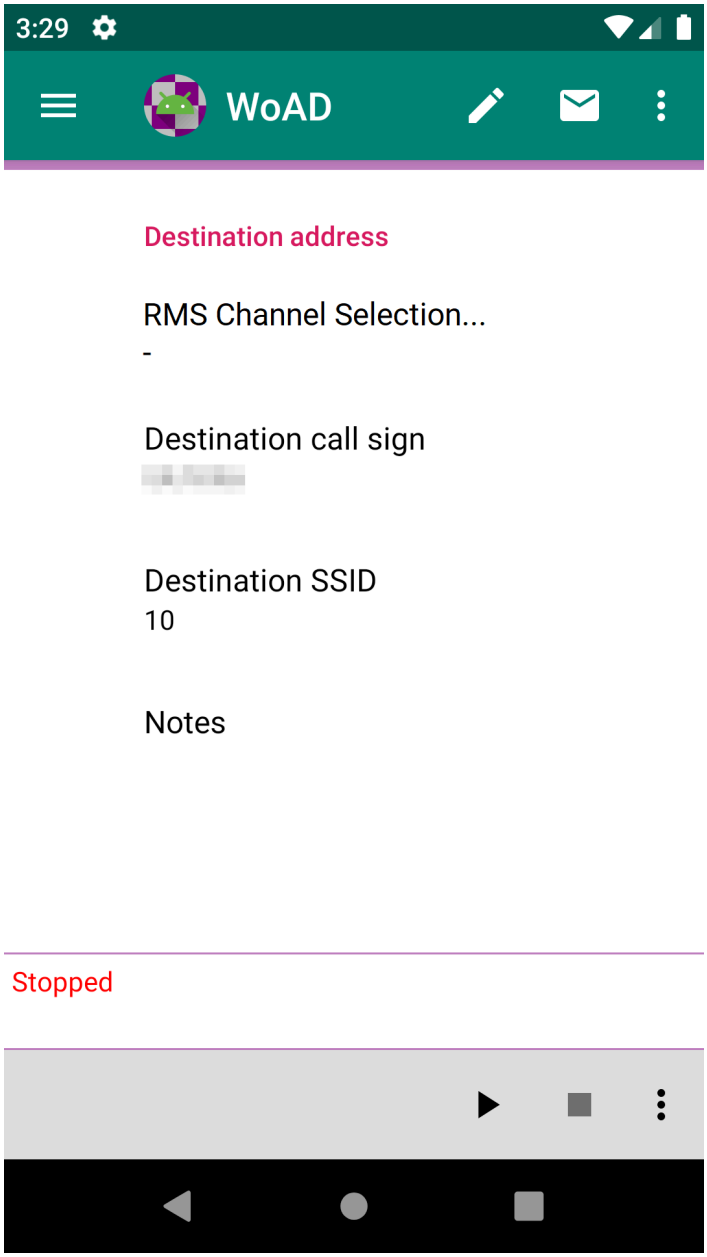
© 2019-2025 Sumus Technology Limited

ARDOP.1 (Outgoing)



© 2019-2025 Sumus Technology Limited

Destination address



RMS Channel Selection...

RMS Channel Selection provides a method to select the desired destination address from a list of RMS channels.

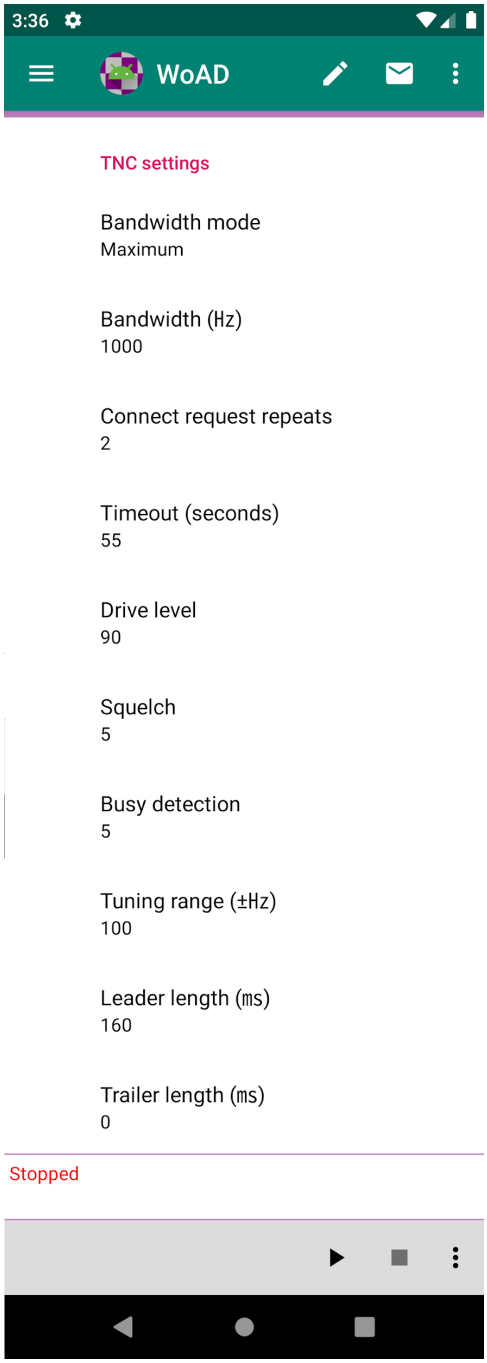
© 2019-2025 Sumus Technology Limited

Destination call sign
Destination SSID

Call sign and SSID of the destination.

© 2019-2025 Sumus Technology Limited

TNC Settings



Bandwidth Mode

Can be **forced**, setting the bandwidth to a specified value, or **maximum**, setting a maximum value for the negotiated bandwidth.

© 2019-2025 Sumus Technology Limited

Bandwidth (Hz)

Can be one of 200, 500, 1000, or 2000Hz.

Connect request repeats

The maximum number of connection request cycles.

Timeout (seconds)

-

Drive level

-

Squelch

Squelch affects the sensitivity of the busy detector and leader detector (low values represent higher sensitivity).

Busy detection

-

Tuning range (±Hz)

-

Leader length (ms)

The leader is a sequence of 10ms symbols at 1500Hz of alternating phase (0, 180°). This is equivalent to each symbol containing a 10ms burst of 1450 and 1500Hz (Two tone) . The leader length may be from 10 symbols (100 ms) to 100 symbols (1000 ms).

Trailer length (ms)

-

TNC Type

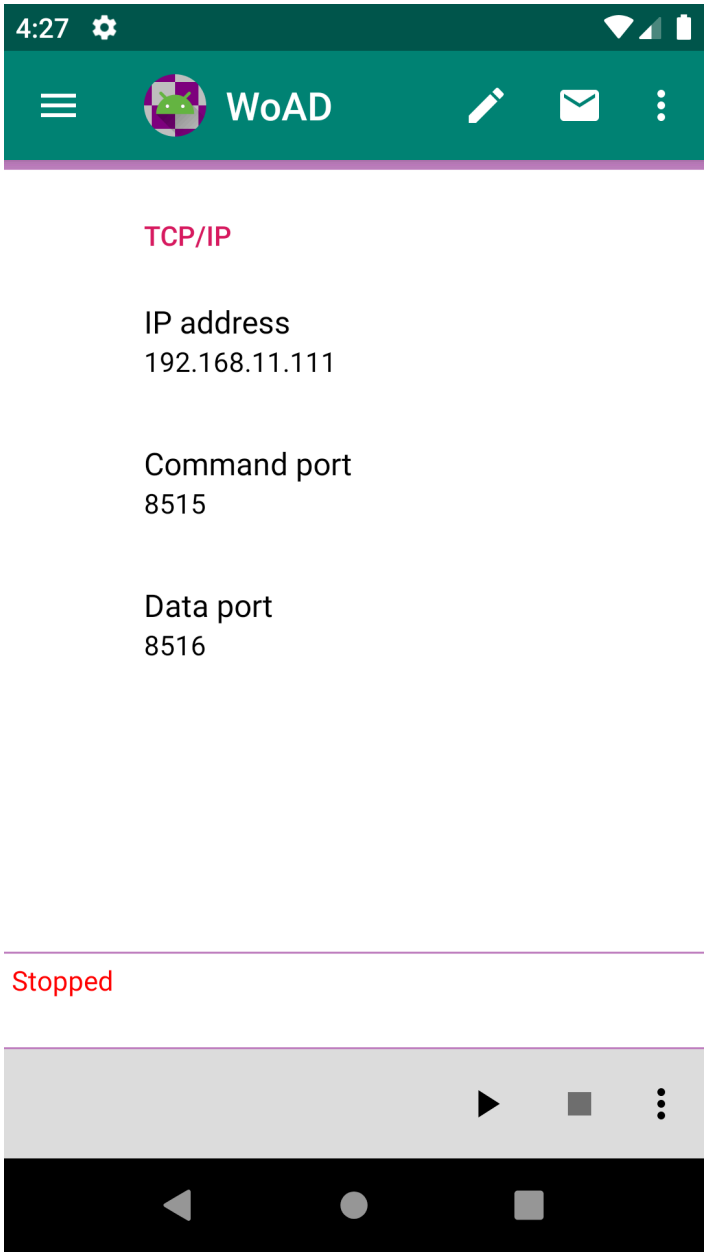
© 2019-2025 Sumus Technology Limited

The **TNC type** can be one of:

- TCP/IP

TNC Configuration

TCP/IP



IP address

The IP address used to connect to an ARDOP.1 virtual TNC.

© 2019-2025 Sumus Technology Limited

Command port

IP port number used for the command interface.

Data port

IP port number used for the data interface. This value is not configurable and is set to be one more than the command port.

© 2019-2025 Sumus Technology Limited

ARDOP.1 (Listener)

The **ARDOP.1 (Listener)** session, once started, will run until stopped. It listens for incoming connection requests on the interface specified.

Once an incoming connection is accepted a new temporary session will be created which will handle the actual exchange of messages. The temporary session will be called **<name> (<call sign>)**, where **<name>** is the name of the existing listener session and **<call sign>** is the call sign of the incoming connection**.** The temporary session protocol will be ARDOP.1 **(Incoming)**. The temporary session will be deleted once the message exchange completes.

The settings for the **ARDOP.1 (Listener)** are the same as for the **ARDOP.1 (Outgoing)**, except that the **destination address** is not present in the former.

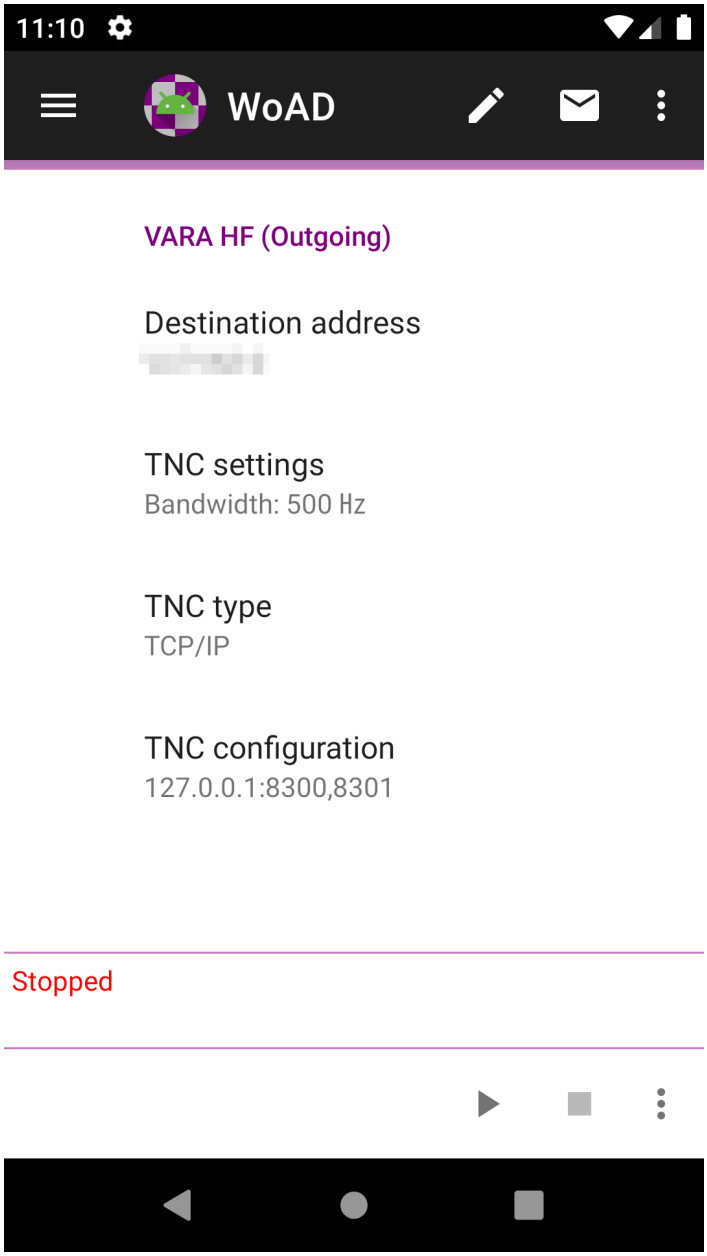
© 2019-2025 Sumus Technology Limited

VARA HF (Outgoing)

“VARA is a High Performance HF modem based on OFDM modulation. VARA Modem, brings state of the art [...] technology to new and existing HF data. Introduces a new standard of technology available for Amateur [...] use. Designed for operation within a SSB Bandwidth of 2400 Hz.” (https://rosmodem.wordpress.com/2017/09/03/vara-hf-modem/)

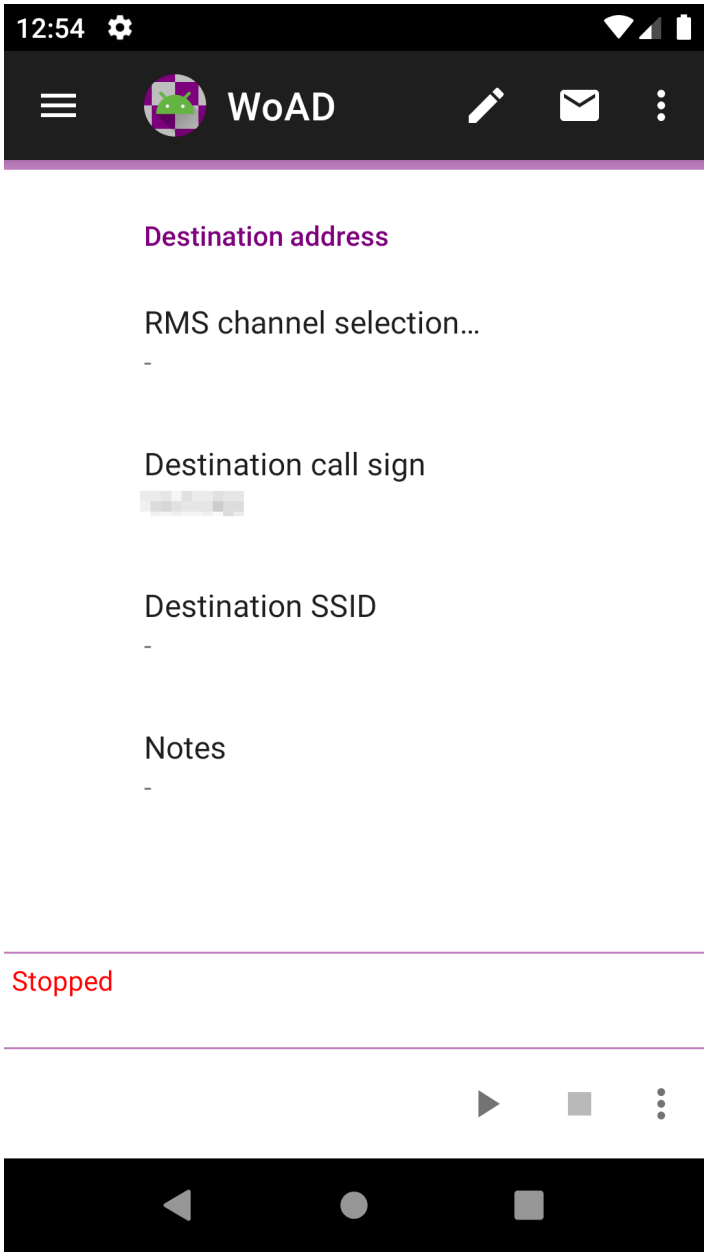
VARA HF runs as a Windows executable, to which WoAD connects through a TCP/IP connection. The VARA HF Windows application can be downloaded from https://rosmodem.wordpress.com.

© 2019-2025 Sumus Technology Limited



Destination address

© 2019-2025 Sumus Technology Limited



RMS Channel Selection...

RMS Channel Selection provides a method to select the desired destination address from a list of RMS channels.

Destination call sign
Destination SSID

Call sign and SSID of the destination.

© 2019-2025 Sumus Technology Limited

TNC settings

Bandwidth (Hz)

Can be one of 500, 2350, or 2700.

TNC type

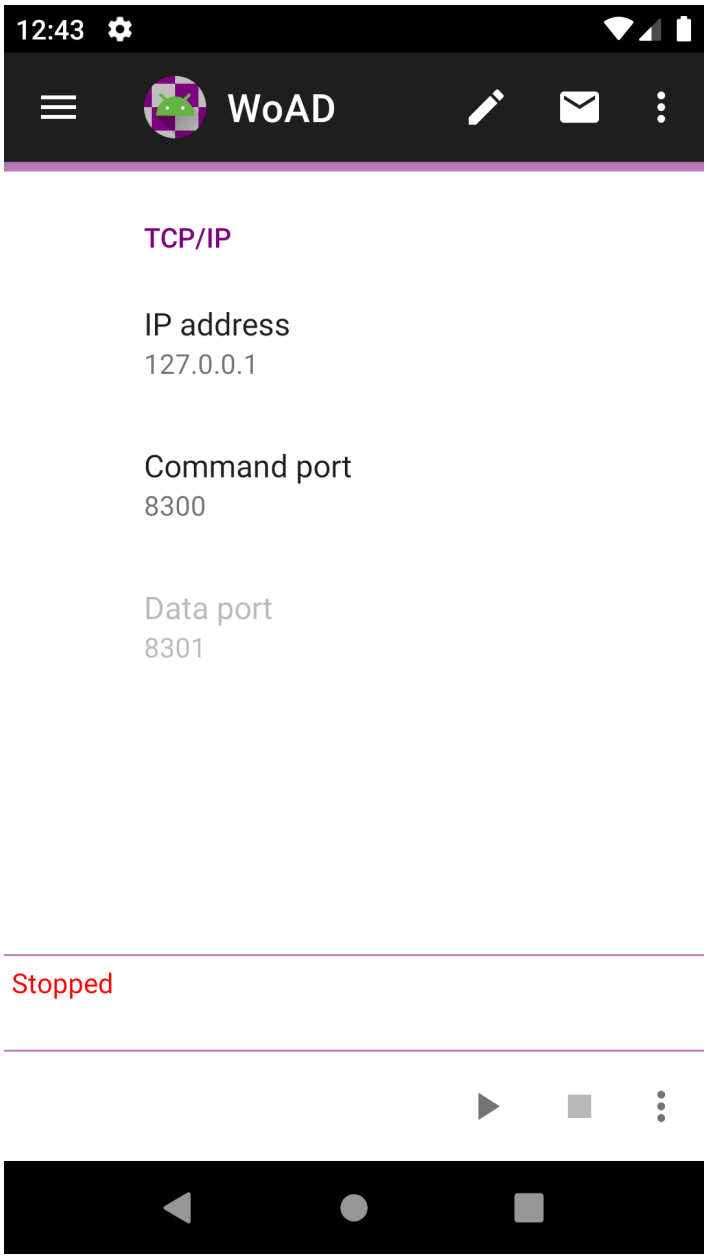
The **TNC type** can be one of:

- TCP/IP

© 2019-2025 Sumus Technology Limited

TNC configuration

TCP/IP



IP address

The IP address used to connect to a VARA HF virtual TNC.

© 2019-2025 Sumus Technology Limited

Command port

IP port number used for the command interface.

Data port

IP port number used for the data interface. This value is not configurable and is set to be one more than the command port.

VARA HF (Listener)

The **VARA HF (Listener)** session, once started, will run until stopped. It listens for incoming connection requests on the interface specified.

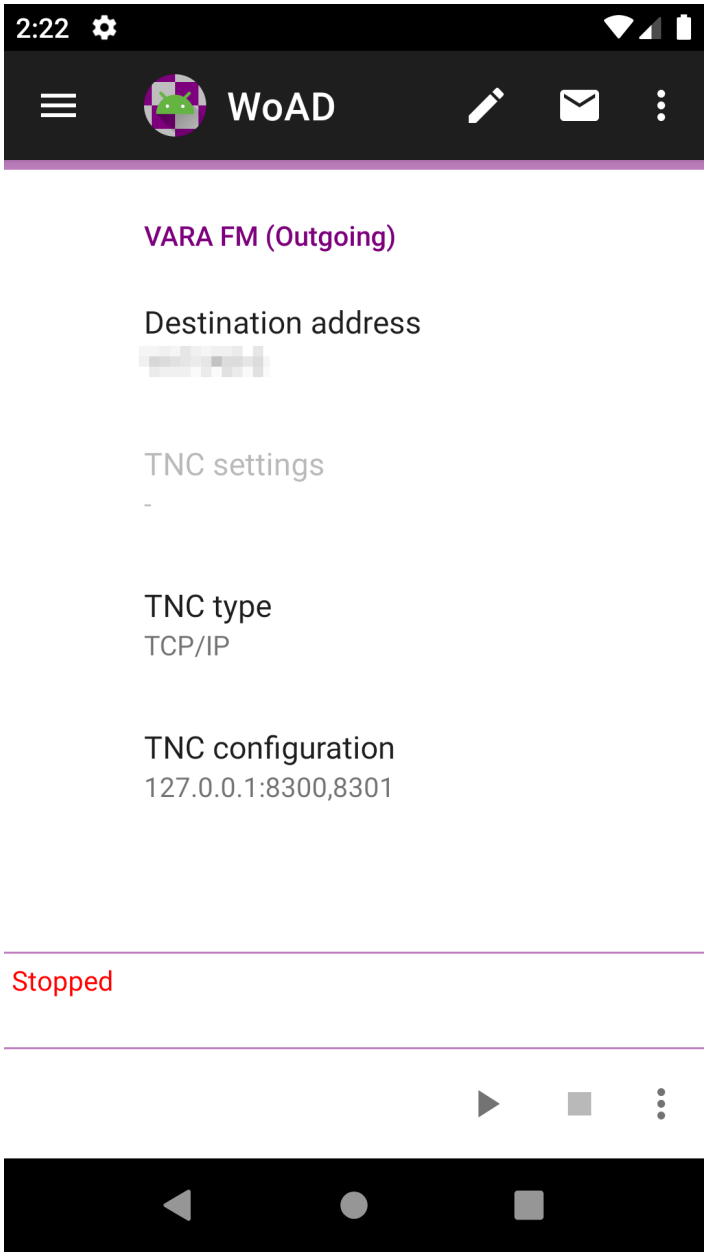
Once an incoming connection is accepted a new temporary session will be created which will handle the actual exchange of messages. The temporary session will be called **<name> (<call sign>)**, where **<name>** is the name of the existing listener session and **<call sign>** is the call sign of the incoming connection**.** The temporary session protocol will be VARA HF **(Incoming)**. The temporary session will be deleted once the message exchange completes.

The settings for the **VARA HF (Listener)** are the same as for the **VARA HF (Outgoing)**, except that the **destination address** is not present in the former.

© 2019-2025 Sumus Technology Limited

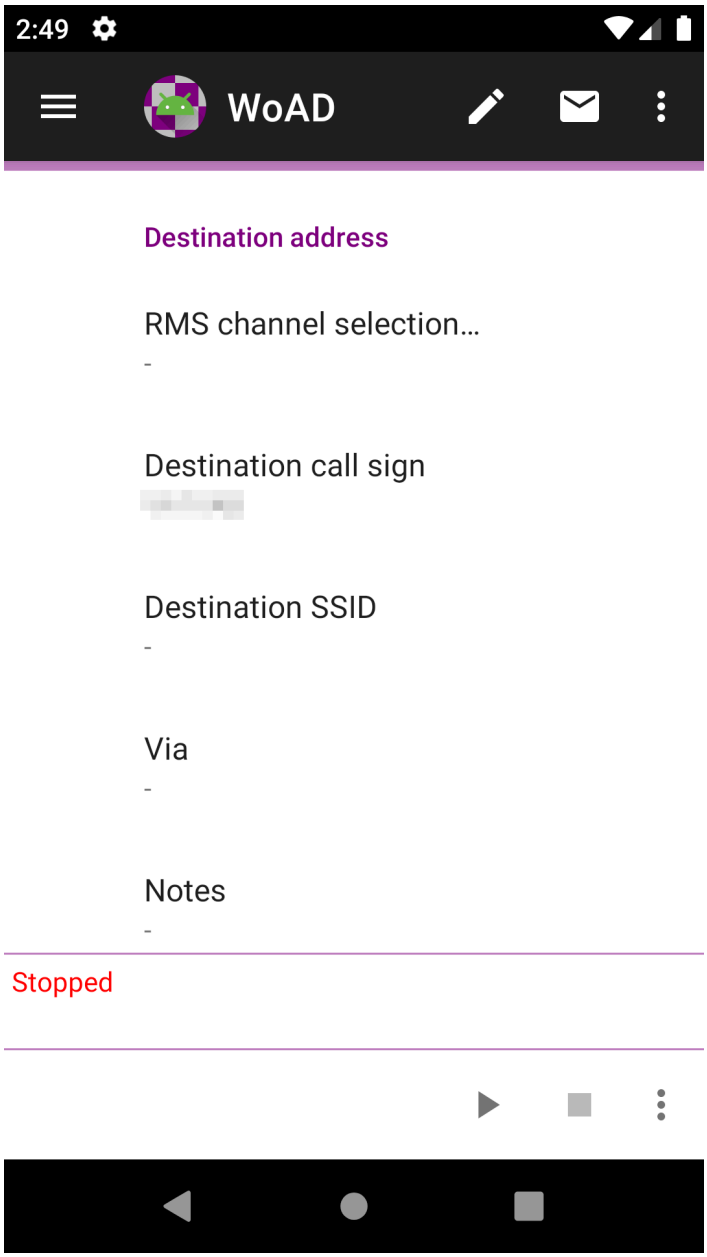
VARA FM (Outgoing)

VARA FM runs as a Windows executable, to which WoAD connects through a TCP/IP connection. The VARA FM Windows application can be downloaded from https://rosmodem.wordpress.com.



© 2019-2025 Sumus Technology Limited

Destination address



RMS Channel Selection...

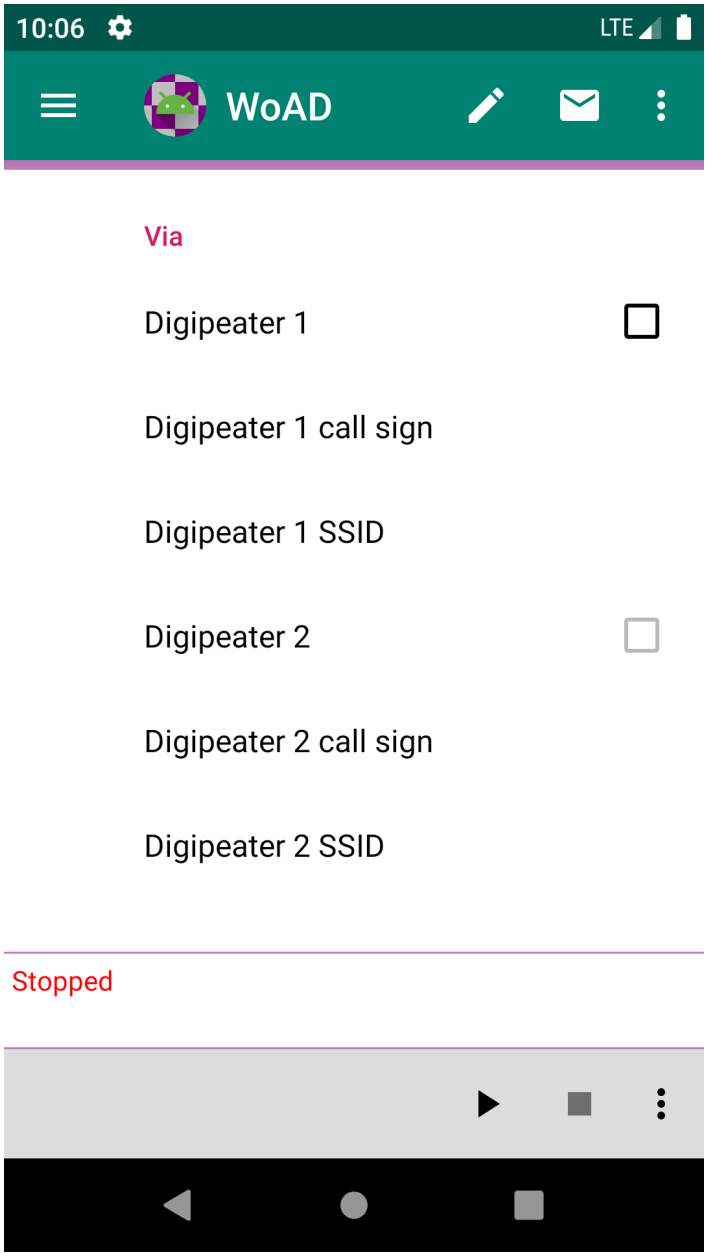
RMS Channel Selection provides a method to select the desired destination address from a list of RMS channels.

Destination call sign
Destination SSID

© 2019-2025 Sumus Technology Limited

Call sign and SSID of the destination.

Via



One, or two, digipeaters can be specified in order to reach the destination address.

Digipeater 1 must be checked to enable the Digipeater 1 address settings and **Digipeater 2** checkbox. Similarly, **Digipeater 2** must be checked to enable the Digipeater 2 address settings.

© 2019-2025 Sumus Technology Limited

TNC settings

-

TNC type

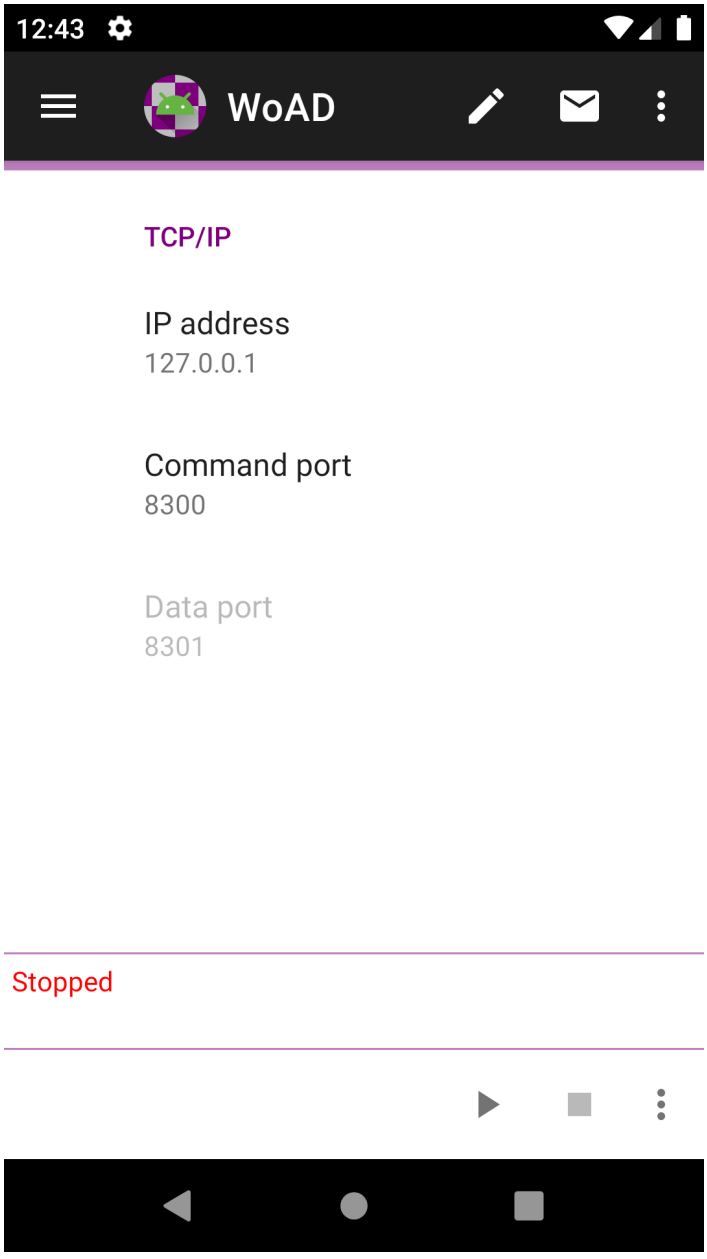
The **TNC type** can be one of:

- TCP/IP

© 2019-2025 Sumus Technology Limited

TNC configuration

TCP/IP



IP address

The IP address used to connect to a VARA FM virtual TNC.

Command port

© 2019-2025 Sumus Technology Limited

IP port number used for the command interface.

Data port

IP port number used for the data interface. This value is not configurable and is set to be one more than the command port.

VARA FM (Listener)

The **VARA FM (Listener)** session, once started, will run until stopped. It listens for incoming connection requests on the interface specified.

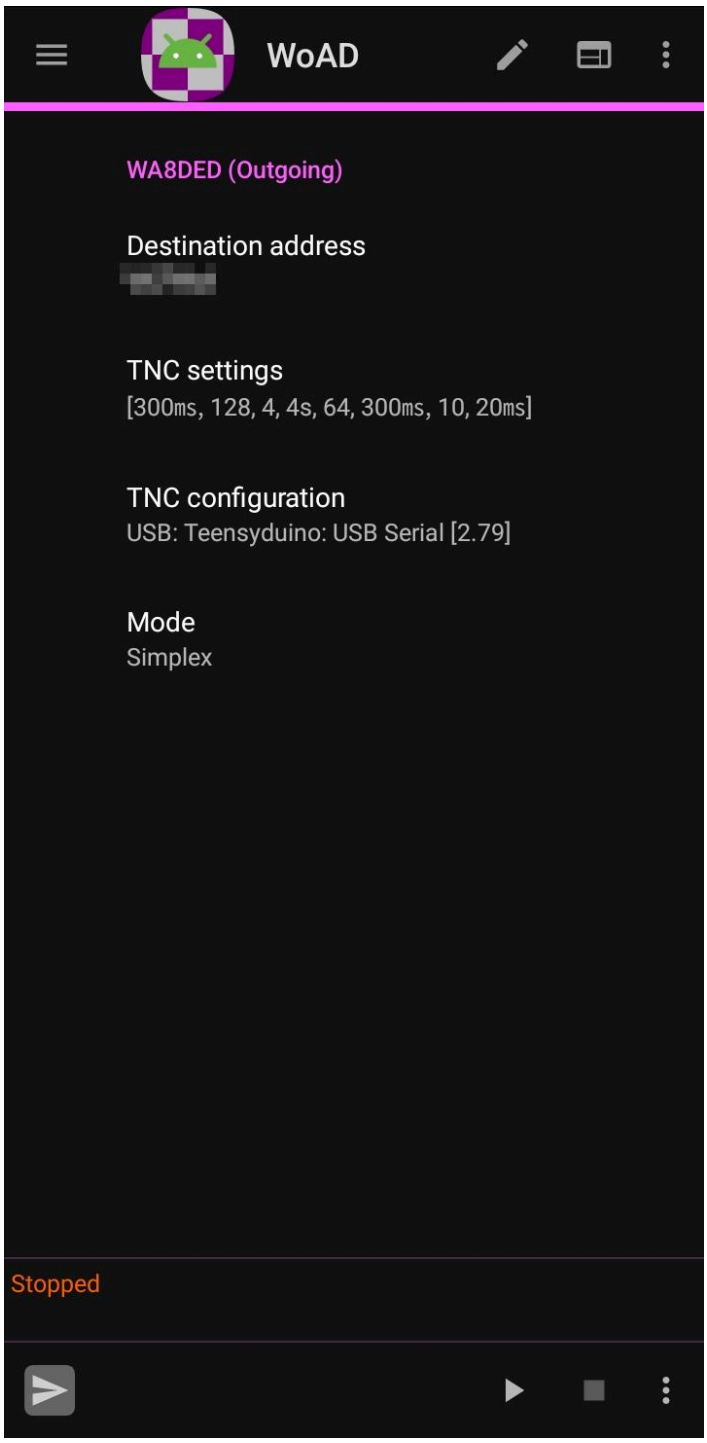
Once an incoming connection is accepted a new temporary session will be created which will handle the actual exchange of messages. The temporary session will be called **<name> (<call sign>)**, where **<name>** is the name of the existing listener session and **<call sign>** is the call sign of the incoming connection**.** The temporary session protocol will be `VARA FM (Incoming)`. The temporary session will be deleted once the message exchange completes.

The settings for the **VARA FM (Listener)** are the same as for the **VARA FM (Outgoing)**, except that the **destination address** is not present in the former.

© 2019-2025 Sumus Technology Limited

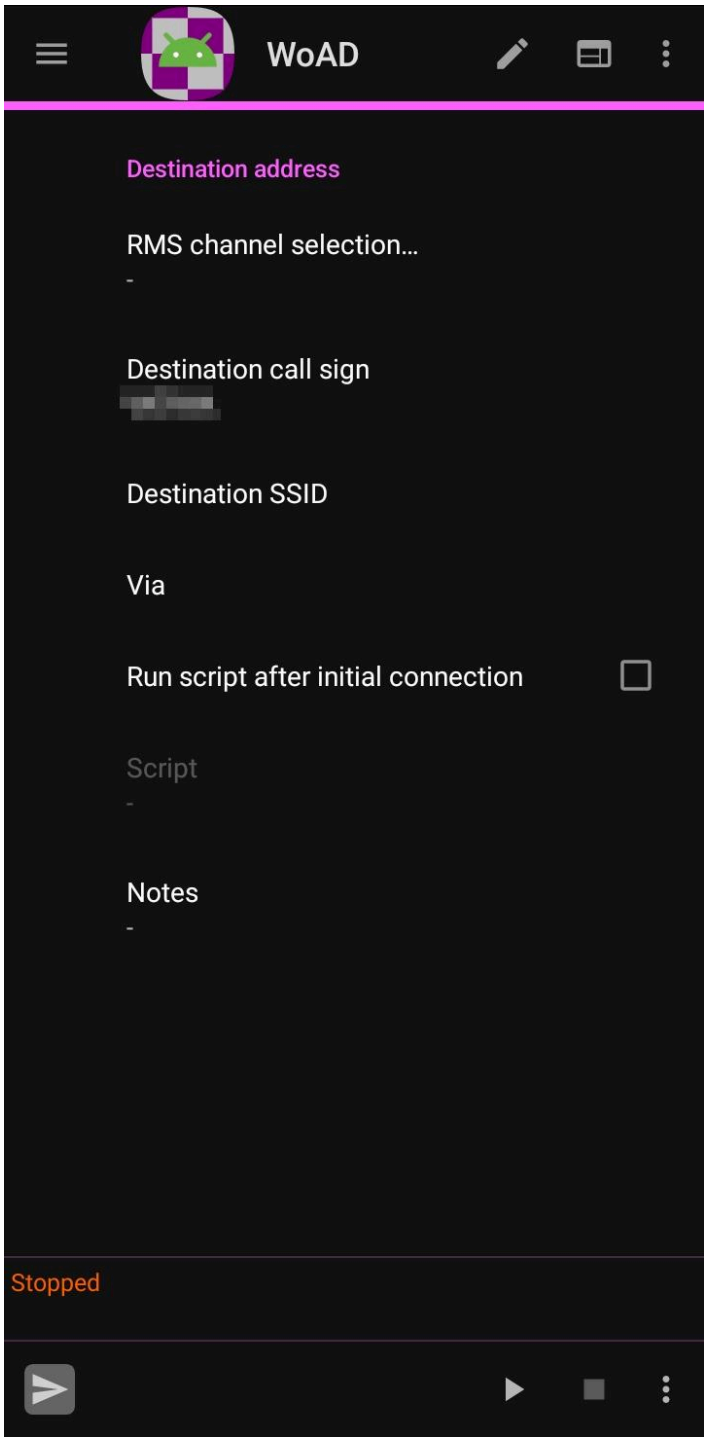
WA8DED (Outgoing)

WA8DED devices are TNCs that support WA8DED host mode. WoAD supports up to 4 channels, automatically assigning the next free channel number to a session when it is started.



© 2019-2025 Sumus Technology Limited

Destination address



RMS Channel Selection...

© 2019-2025 Sumus Technology Limited

RMS Channel Selection provides a method to select the desired destination address from a list of RMS channels.

Destination call sign
Destination SSID

Call sign and SSID of the destination.

Via

Up to eight digipeaters can be specified, as a space separated list.

Run script after initial connection

If checked the **script** will be used to guide the connection through the packet network.

Script
This setting will be enabled only if '**Run script after initial connection'** is checked.

A script can contain three different line types:

4. Command line: can appear anywhere in the script, begins with a '!' (exclamation point), and is optional: in their absence default values are used.
    a. `!CONNECTTIME` <seconds> — specifies the duration, in seconds, allowed for each connection through the network. The default value is 60.
    b. `!TOTALTIME` <seconds> — specifies the total duration, in seconds, allowed for the entire script to complete. The default value is 300.
    c. `!WAITFOR` <text> — specifies that the script is to wait until the specified text is found in the response from the server.
5. Response: the first non-command line is assumed to be the desired response from the specified **destination call sign**. The script will continue only when the specified response is found anywhere in the response from the packet node. Each subsequent response must be preceded by a connection request.
6. Connection request: a connection request to establish a link with the next node in the network *e.g.* `CONNECT VE1PKT`. The final connection request is assumed to terminate at either a Winlink CMS or P2P server, for which no response line is necessary. Note that the syntax of each connection request will depend on the node being communicated with.

Notes

Any notes that you want to associate with the script.

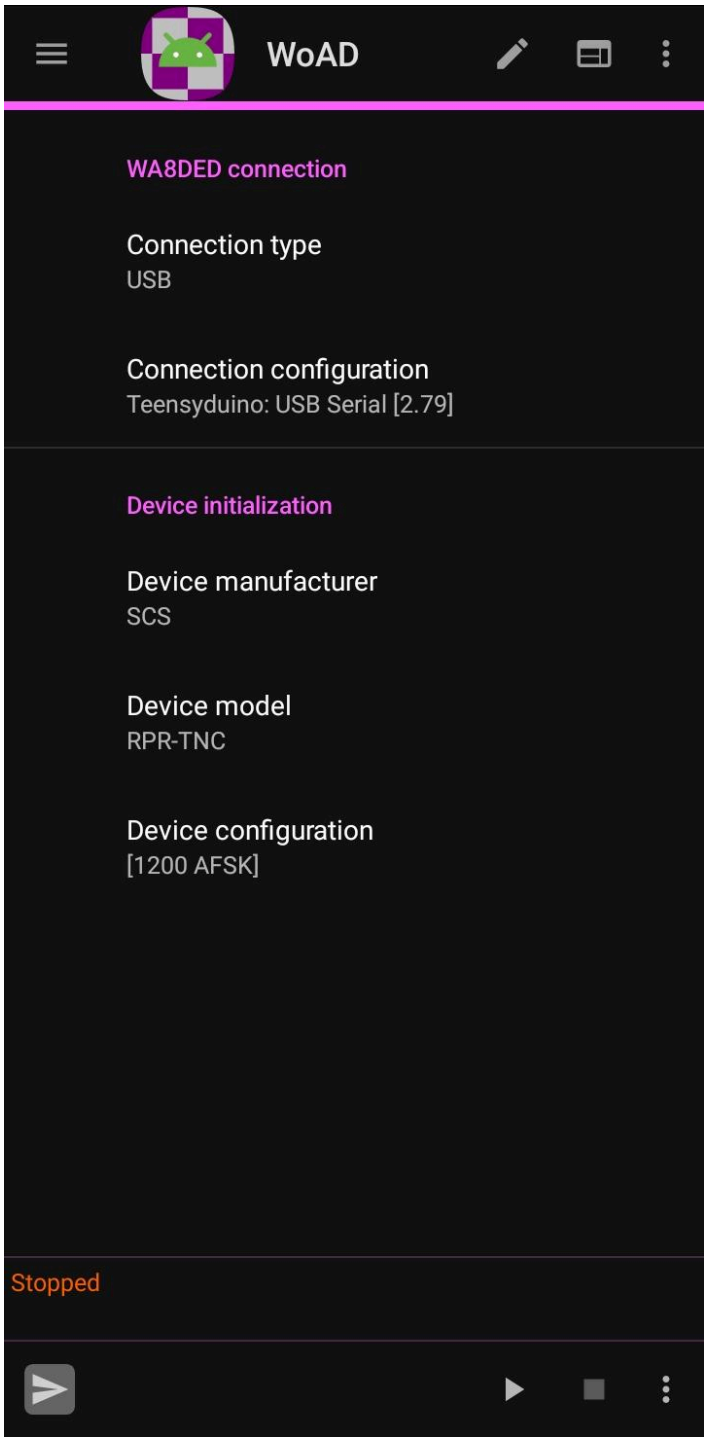
© 2019-2025 Sumus Technology Limited

TNC settings

The TNC settings are the same as for Packet (Outgoing).

© 2019-2025 Sumus Technology Limited

TNC configuration



Connection Type

© 2019-2025 Sumus Technology Limited

Can be one of:

- **Bluetooth**
- **TCP/IP**
- **USB**

This must be set to reflect the type of connection made from the Android device, either directly to the radio, or to the initial intermediary device.

One or more of these options may be absent or disabled if the underlying technology is not supported by your device. In particular, not all devices support USB host (OTG) mode, Bluetooth, or BLE.

Connection configuration

The connection configuration will depend on the selected connection type:

- **Bluetooth**:

  Device

  Allows selection of the Bluetooth® device to communicate with from the paired devices.

  Settings…

  Launches the Android Bluetooth® settings screen. This can be used to pair with the desired device.

- **TCP/IP**:

  IP address
  IP port

  The IP address and port used to connect to the internet-enabled device.

- **USB**:

  In order to communicate with a radio or modem via your Android device's USB connection, the Android device must support USB host mode, also known as On-The-Go (USB OTG).

  USB port

  The USB port to which the radio (or intermediary device) is attached. If one or more suitable devices are found the entries will be something like:

© 2019-2025 Sumus Technology Limited

```
Silicon Labs: CP2102 USB to UART Bridge Controller
[/dev/bus.usb/001/002]
```

Use device settings

If checked the device selected (see device initialization) will be initialized appropriately based on its known settings and specified configuration values. Otherwise the specified serial configuration properties (baud rate, data bits, stop bits, parity, DTR, and RTS) will be used.

Device manufacturer

Select the manufacturer of the device to be initialized. Unless you are connecting directly to a listed device manufacturer and model this should be left at **Generic**.

Device model

If applicable, select the particular model produced by the selected manufacturer.

Device configuration

The configuration settings, if any, will depend on the choice of manufacturer and model.

Mode

Set the transmission mode to either **simplex** or **duplex**. This setting may be ignored if it is not supported by the underlying hardware. The default is **simplex**.

WA8DED (Listener)

The **WA8DED FM (Listener)** session, once started, will run until stopped. It listens for incoming connection requests on the interface specified.

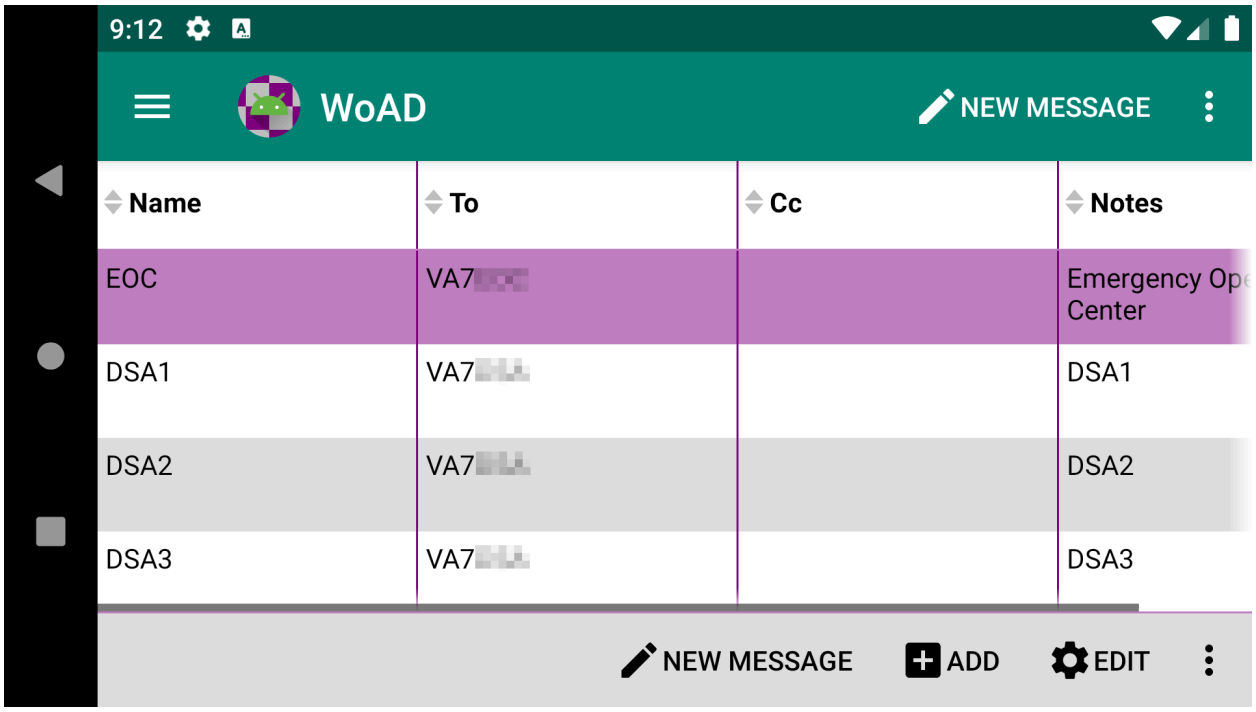
Once an incoming connection is accepted a new temporary session will be created which will handle the actual exchange of messages. The temporary session will be called **<name> (<call sign>)**, where **<name>** is the name of the existing listener session and **<call sign>** is the call sign of the incoming connection**.** The temporary session protocol will be `WA8DED` **(Incoming)**. The temporary session will be deleted once the message exchange completes.

© 2019-2025 Sumus Technology Limited

The settings for the **WA8DED (Listener)** are the same as for the **WA8DED (Outgoing)**, except that the **destination address** is not present in the former.

© 2019-2025 Sumus Technology Limited

Contacts



Contacts can be used to store a list of addresses. Each contact can have numerous addresses in each of the **To** and **Cc** fields, separated by a space, comma, or semicolon.

You can select an existing contact using a short click, or edit an existing contact using a touch-and-hold (long press).

In the **New/Edit Message** screen an existing contact can be selected from the **Contacts…** item on the bottom app bar, which will automatically populate the **To** and **Cc** fields from the corresponding contact entry.

Menu

New message

Create a new message, with the To and Cc fields already filled with the corresponding fields in the selected contact. This item will be disabled if no contact is selected.

New message from template

© 2019-2025 Sumus Technology Limited

Create a new message from the selected template, with the To and Cc fields already filled with the corresponding fields in the selected contact. This item will be disabled if no contact is selected.

Note that some templates may override the specified **To** or **Cc** values. For example the `CIRM Medical Assistance/CIRM` template will set the **To** field to `telesoccorso@cirm.it`.

Add

Open the **Edit Contact** screen, allowing a new contact to be created.

Edit

Open the **Edit Contact** screen to allow editing of the currently selected contact. This item will be disabled if no contact is selected. You can also touch-and-hold (long press) an existing contact to edit it.

Delete

Delete the currently selected contact. This item will be disabled if no contact is selected.

Export

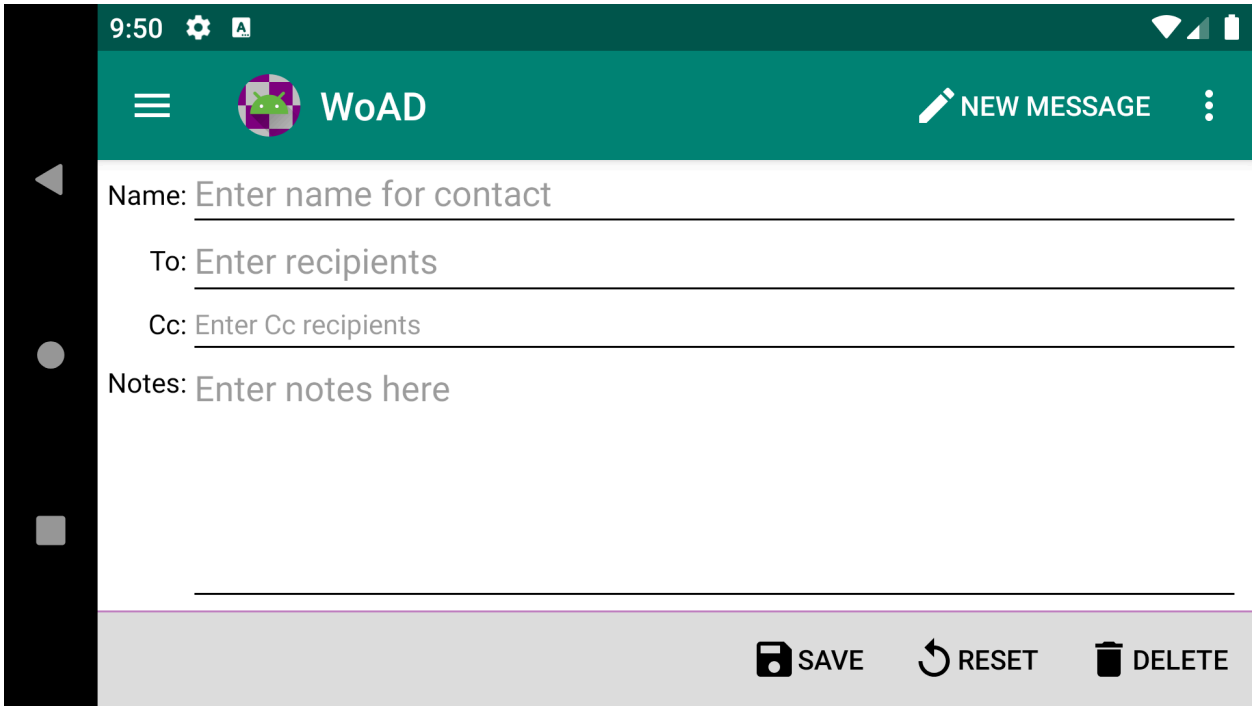
Export the contacts to a file.

Import

Import contacts from a file. The file can be the format exported either by WoAD or by Winlink. Contacts in the imported file with a name in common with an already existing contact will be ignored.

New/Edit Contact

© 2019-2025 Sumus Technology Limited



Menu

Save

Save the contact. This will close the **Edit Contact** screen and return you to the **Contacts** screen.

Reset

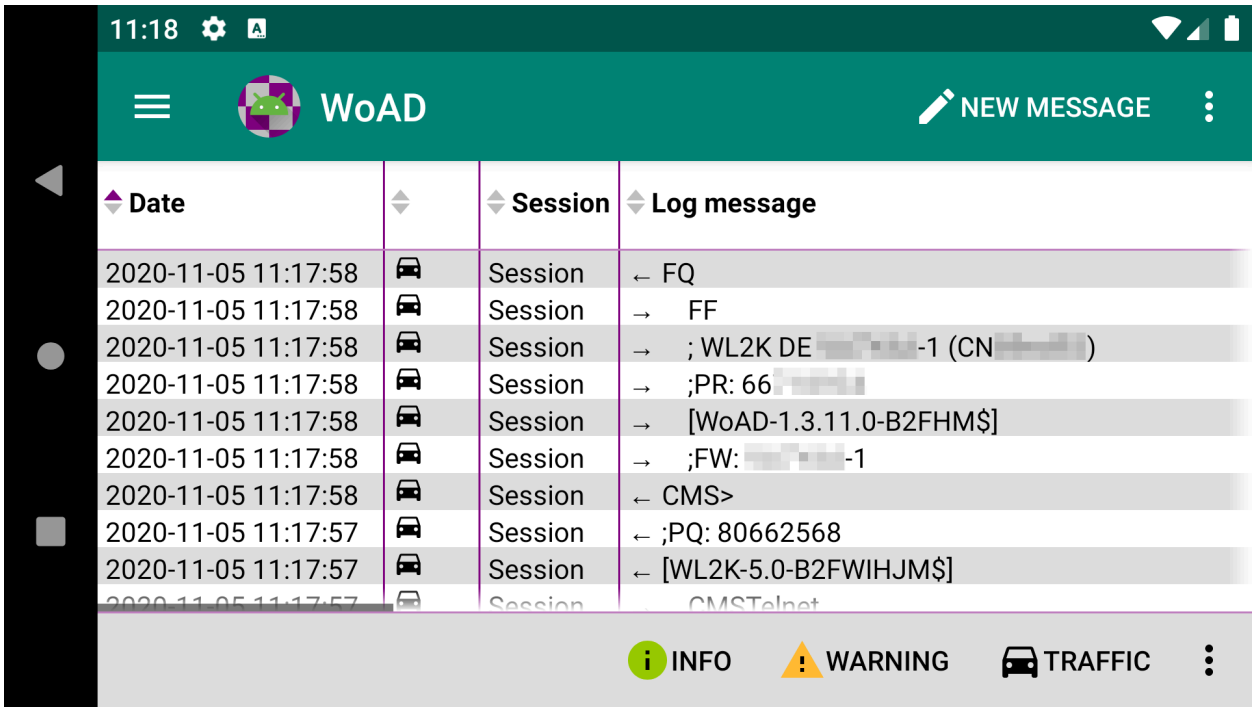
Reset the various fields to their original values.

Delete

Delete the contact. This will close the **Edit Contact** screen and return you to the Contacts screen.

© 2019-2025 Sumus Technology Limited

Logs



The **Logs** screen provides a log of recent app activity. You can toggle on and off the various types of log entries by selecting the corresponding item on the bottom app bar. Error log entries, denoted by , are always enabled.

The log entries can be saved to a text file through the Export item on the bottom app bar.

Log entries older than the duration specified in the Settings will be automatically deleted.

Menu

Info

Toggle display of info messages. Info log entries include, among others, the saving of messages, contacts, and sessions, and entries related to the receipt and delivery of messages.

Warning

Toggle display of warning messages. Warning messages include, among others, unexpected failures and user input problems.

© 2019-2025 Sumus Technology Limited

Traffic

Toggle display of traffic messages. Traffic messages include B2F traffic.

APRS

Toggle display of APRS messages.

Packet

Toggle display of packet messages. Packet messages include AX.25 information frames which are produced only when running a packet mode session.

Other Packet

Toggle display of other packet messages. Other packet messages include AX.25 supervisory and unnumbered frames, which are produced only when running a packet mode session.

Debug

Toggle display of debug messages. Debug messages include, among others, messages detailing the behavior of the various AX.25 state machines (relevant only in packet mode) and the behavior of the B2F state machine.

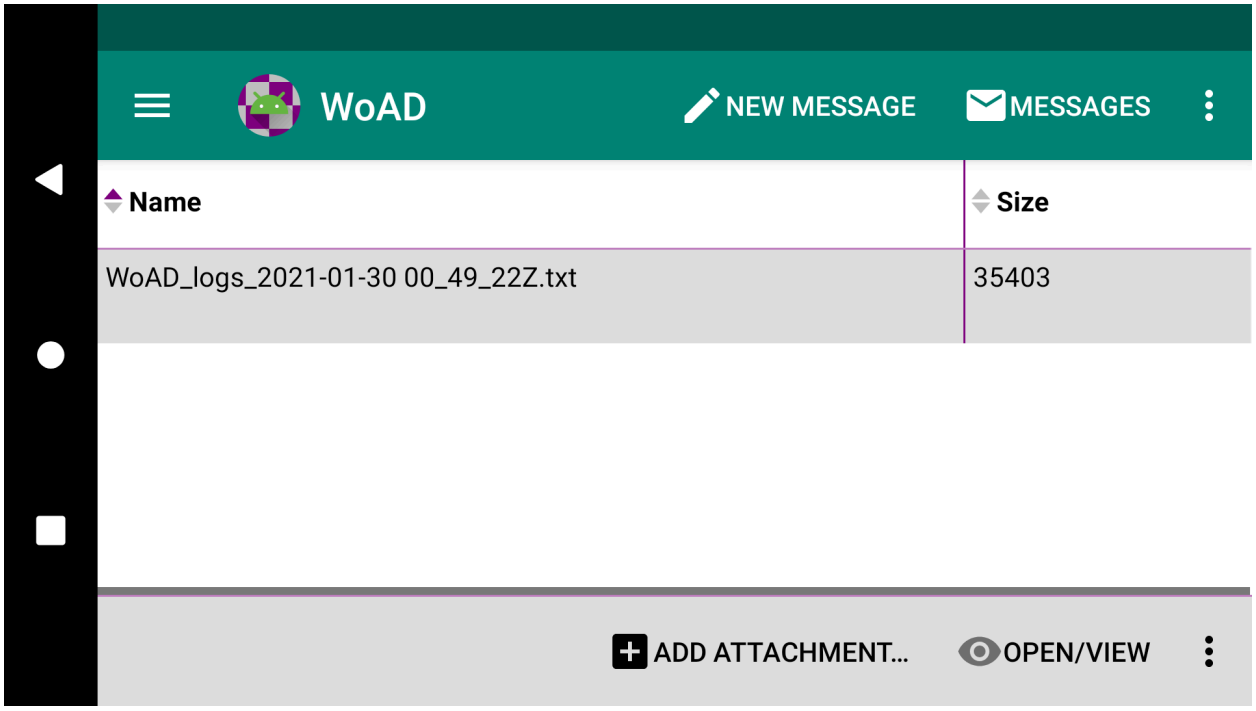
Export

Export the log messages to a text file. *Only those message types selected for display will be saved to the file.*

By default the text file will be called `WoAD_logs_<yyyy-MM-dd HH:mm:ss>Z.txt`, where `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_logs_2020-11-05 20_49_33Z.txt`.

© 2019-2025 Sumus Technology Limited

Attachments



The **Attachments** screen is always opened from within an open message that has not yet been sent. It allows attachments to be added to or removed from the message.

Columns

Name

The name of the attached file.

Size

The size of the attached file in bytes.

Menu

Add

© 2019-2025 Sumus Technology Limited

Add an attachment to the message.

Open/View

Opens or views the selected attachment, if a suitable intent could be found.

Delete

Delete the selected attachment from the message.

Export

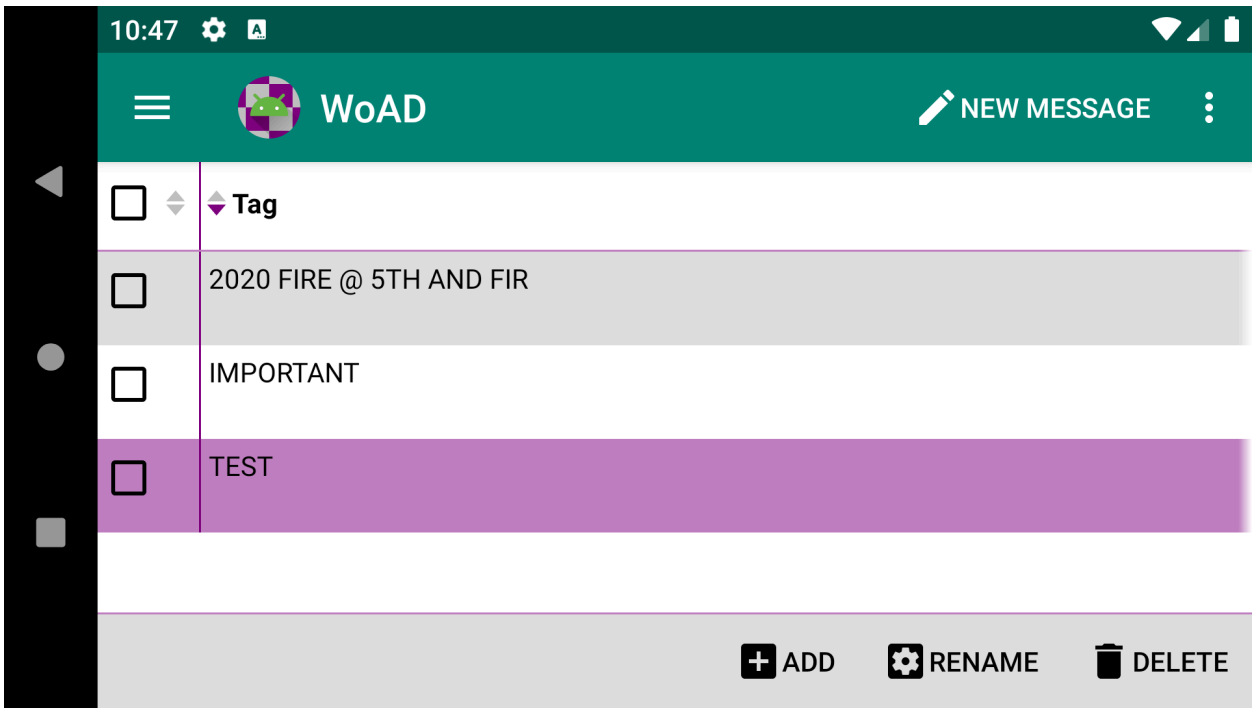
Export the selected attachment to a file.

Export all

Export all attachments to files.

© 2019-2025 Sumus Technology Limited

Tags



The **Tags** screen is always opened from a selected message or messages. It allows tags to be associated or disassociated with the selected message(s), as well as the creation of new tags and the renaming and deletion of existing tags.

Each tag created will appear in the navigation drawer, with the number of messages associated with that tag after it, in brackets. Selecting a tag from the navigation drawer will display the messages associated with the tag in the Messages screen.

Columns

Checkbox

The checkbox can be in one of three states:

☑ Checked: all of the selected message(s) are associated with the corresponding tag.

☐ Unchecked: none of the selected message(s) are associated with the corresponding tag.

▬ Indeterminate: some, but not all, of the selected message(s) are associated with the corresponding tag.

© 2019-2025 Sumus Technology Limited

Tag

The name of the tag, which will appear in the navigation drawer.

Menu

 Add

Create a new tag.

 Rename

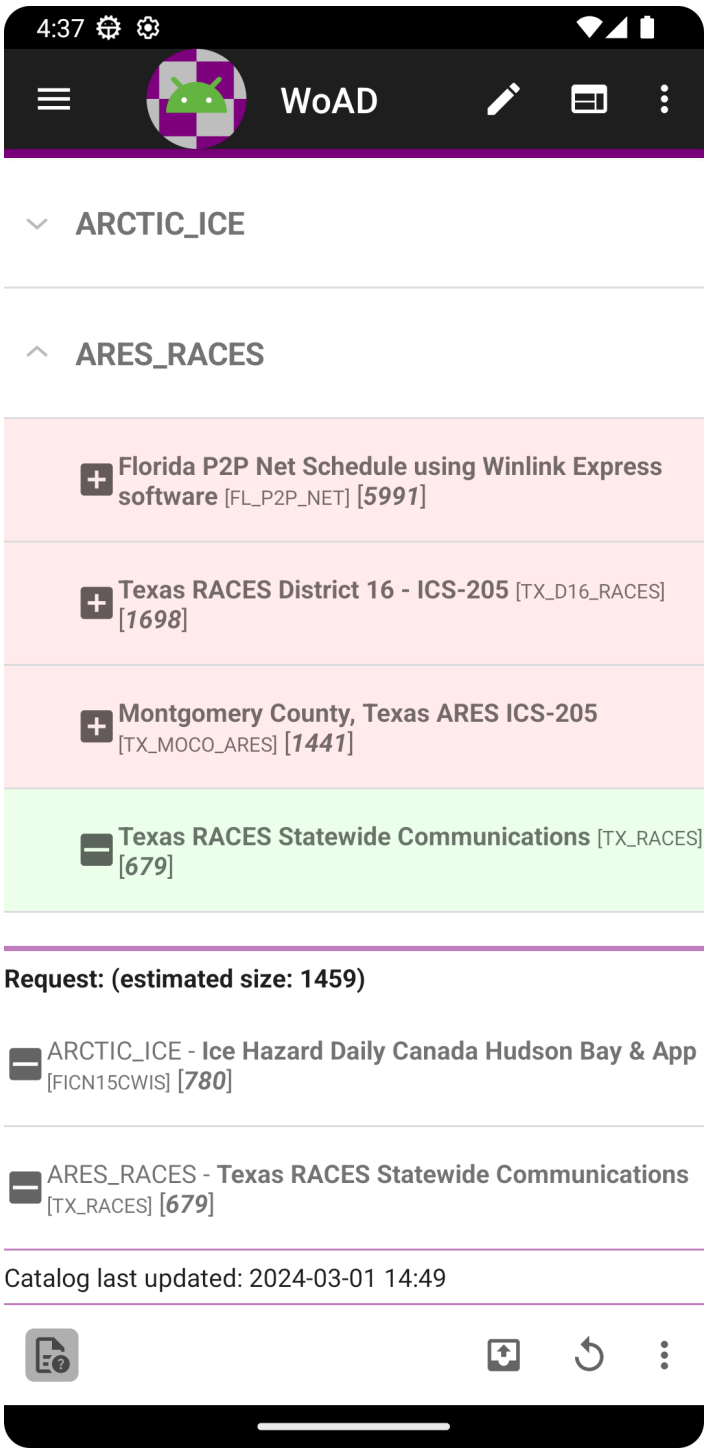
Rename the selected tag.

 Delete

Delete the selected tag. This will not affect any message that is associated with the tag, other than the removal of the association.

© 2019-2025 Sumus Technology Limited

Catalog Query



© 2019-2025 Sumus Technology Limited

The **Catalog Query** screen provides an interface for requesting information from saildocs (http://www.saildocs.com/) through a catalog of available queries which is made available by and downloaded from Winlink (https://winlink.org/). To make a request the catalog must be updated after first installing WoAD, as it is initially empty. The catalog should be updated from time to time as the available queries may occasionally change.

In the upper or left list (depending on whether your device is in portrait or landscape mode) the available queries are sorted into categories. A category may be expanded or collapsed by tapping on the category title.

Each query has a description, together with an associated identifier and estimated response size, both of which are given in square brackets..

A query can be added to, or removed from, a request by tapping on the query. When a query is part of a request it will be highlighted in green with a minus (⊟) symbol preceding it, else it is highlighted in red, with a plus (⊞) symbol preceding it.

In the lower or right list (depending on whether your device is in portrait or landscape mode) the queries that are part of a request are shown.with the total estimated response size directly above. Each query is shown with its associated category, description, identifier, and estimated response size. A query can be removed from a request by tapping on the query in the request list.

After creating a request with the desired queries, post the request to the Outbox and then run a session to send it. Wait at least a few minutes to run a session to retrieve the results.

Menu

Post request to Outbox

Post the request to the Outbox.

Reset request

Remove all queries from the request.

Update catalog via internet

Update the catalog through an internet connection.

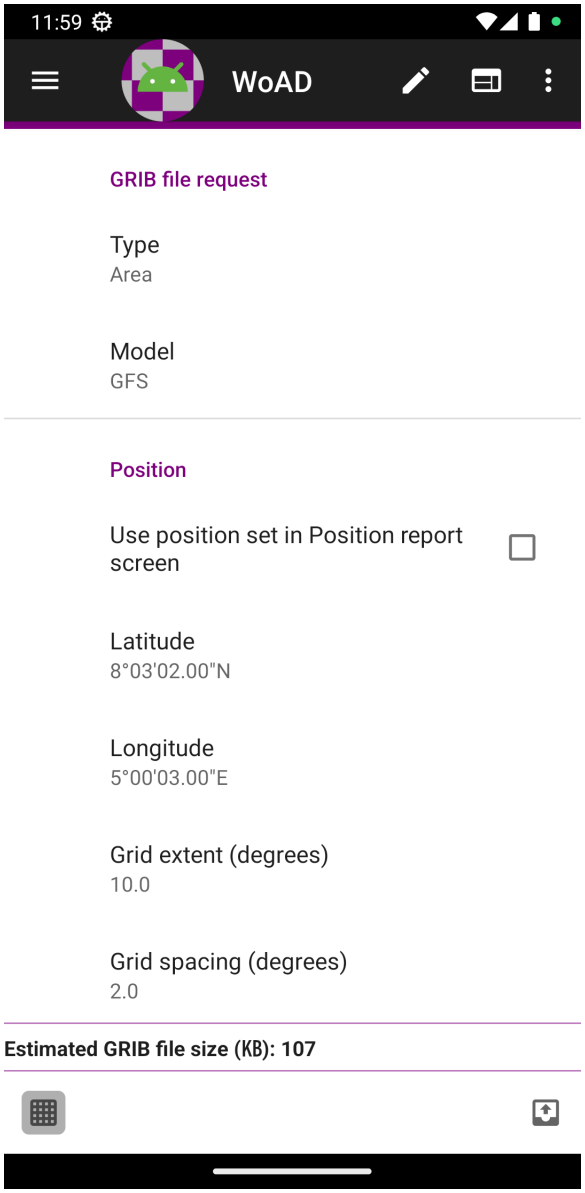
© 2019-2025 Sumus Technology Limited

Update catalog via message

Update the catalog via a message which will be posted to the Outbox.

© 2019-2025 Sumus Technology Limited

GRIB File Request



GRIB file requests are made by sending an appropriately constructed message to query@saildocs.com. You should ensure that you have read the information at https://saildocs.com/gribinfo so you have an understanding of the features and limitations of this service. You should also carefully read the notes sent with the first area and spot forecast responses that you receive.

© 2019-2025 Sumus Technology Limited

After sending the message be sure to allow sufficient time for saildocs to respond before attempting to retrieve the response.

In order to view the attached GRIB files you will need a GRIB file viewer installed on your Android device.

Type

Type can be **Area** or **Spot**.

When **Area** is selected the message sent in response will include a GRIB file as an attachment, containing a forecast covering the extended area and duration specified. When **Spot** is selected the message body sent in response will contain a forecast for the spot location and duration specified.

Model

The options available will depend on the **Type** selected.

Position

Use position set in Position report

If checked the forecast will be centered on the position set in the Position Report Screen and the **Latitude** and **Longitude** will be disabled.

Latitude
Longitude

The position for the forecast center. When '**Use position set in Position report'** is set these options will be disabled.

Grid extent (degrees)
Grid spacing (degrees)

When the **Type** is set to **Area** the forecast will cover the specified extent on a grid with the specified spacing. The options available will depend on the selected **Model**.
When the **Type** is set to **Spot** these options will be disabled.

Timing

Duration (hours)

© 2019-2025 Sumus Technology Limited

Minimum interval (hours)

The duration and minimum interval of the forecast in hours. The options available will depend on the **Type** and **Model** selected.

Information

The list of information available will depend on the **Type** and **Model** selected. Check an item to include it in the forecast.

Estimated GRIB file size

The estimated GRIB file size, in kilobytes, that will be sent in response to an **Area** query. It is important that you ensure the size of the expected response is reasonable given the associated session's connection type and speed.

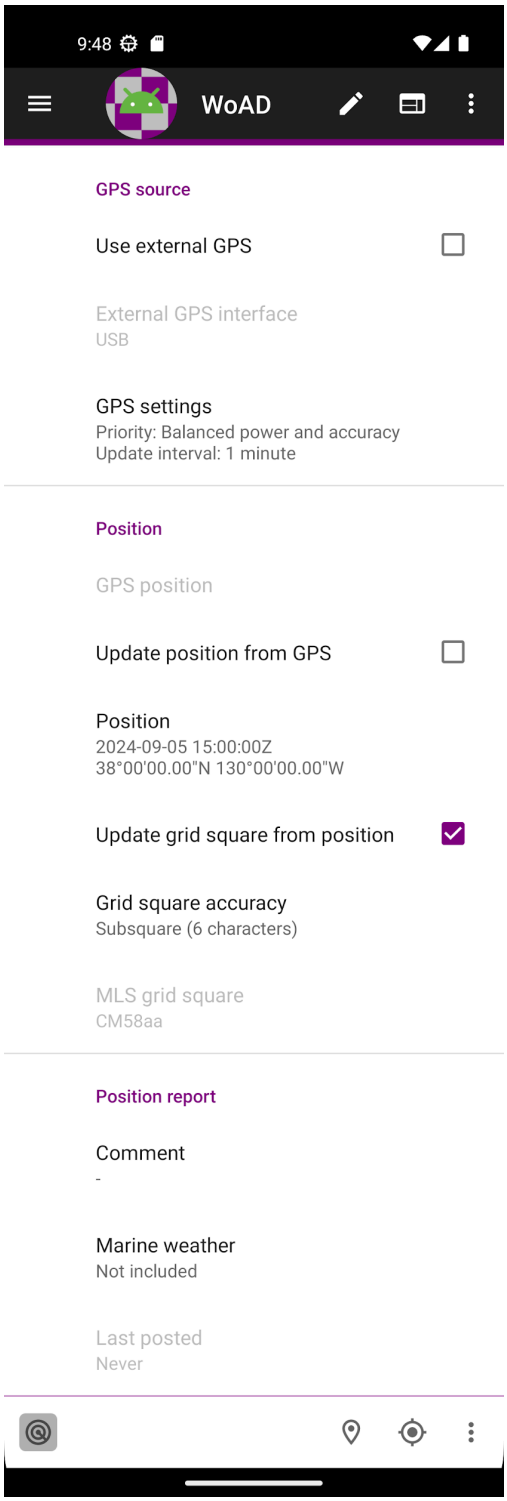
Menu

Post to Outbox

Post the GRIB file request to the Outbox.

© 2019-2025 Sumus Technology Limited

Position Report



© 2019-2025 Sumus Technology Limited

The Position Report screen allows configuration of the GPS (either internal or external) device which is used to determine a `GPS position`. The `Position` and `MLS grid square` can be updated from the `GPS position`, or set independently. These values are frequently used in message templates and HTML forms.

The Position Report screen also allows a position report to be configured and posted to the Outbox.

Use external GPS

The default for this option is unchecked, but if your Android device does not have an internal GPS you can check this option to interface with an external GPS.

External GPS interface

If **Use external GPS** is unchecked then this option will be disabled and the internal GPS will be used. If **Use external GPS** is checked then the options available to interface to an external GPS device will include:

- USB (default)
- Bluetooth
- TCP/IP
- UDP broadcast
- WebSocket

GPS settings

The GPS settings available will depend on the choice of **Use external GPS** and **External GPS interface.**

When **Use external GPS** is unchecked this allows configuration of the priority and update interval.

The priority can be one of:

- **Balanced power and accuracy**: provides “block” level accuracy, considered to be about 100 meter accuracy. Using a coarse accuracy such as this often consumes less power.
- **High accuracy**: provides the most accurate locations available.
- **Low power**: provides "city" level accuracy, considered to be about 10 km accuracy. Using a coarse accuracy such as this often consumes less power.
- **No power**: provides the best accuracy possible with zero additional power consumption. No locations will be returned unless a different client has requested

© 2019-2025 Sumus Technology Limited

location updates in which case this request will act as a passive listener to those locations.

The desired update interval can be specified in units of seconds, minutes, or hours. The specified interval has a direct influence on the amount of power used by your application. Choose your interval wisely. This interval is inexact. You may not receive updates at all (if no location sources are available), or you may receive them slower than requested. You may also receive them faster than requested (if other applications are requesting the location at a faster interval).

When **Use external GPS** is checked this allows configuration of the selected **External GPS interface**. For example if the **External GPS interface** is set to TCP/IP then the **GPS settings** will allow configuration of the TCP/IP address and port.

GPS position

A read-only field giving the date, latitude, and longitude of the most recent GPS update, if any. This may also contain a speed and bearing.

The values in this field can be used in message templates and HTML forms through the `GPS`, `GPS_DECIMAL`, and `GPS_SIGNED_DECIMAL` tags.

Update position from GPS

If checked the position, immediately below, will be automatically updated when a GPS update is received.

Position

This field is read-only when **Update position from GPS** is checked, else it is editable.

The values in this field can be used in message templates and HTML forms through the `Position` tag.

Update grid square from position

If checked the MLS grid square will be automatically updated from the specified position, overwriting any existing MLS grid square.

MLS grid square

© 2019-2025 Sumus Technology Limited

The Maidenhead Locator System (MLS) uses a brief string of alternating pairs of letters and digits to specify a latitude and longitude. The more alternating pairs that are used the greater the precision. Three pairs are typically used on VHF/UHF.

Manually entering an invalid MLS grid square value will result in a warning message and the MLS grid square setting will remain unchanged.

Comment

This comment is added to the position report.

Marine Weather

For use by marine users only, to give additional weather information.

Last posted

A read-only field giving the last time that a position report was posted to the Outbox.

Menu

Single Update

Request a single update of the geographical location of the device. Depending on the position settings, the update will be propagated to the latitude, longitude, and MLS grid square. A request for a single update will continue until a position is acquired or, in some situations, times out. It should be noted that an active single update will continue across WoAD being closed and reopened.

This option will be disabled if a single update or continuous updates is already active.

Start Continuous Updates

Start continuous updates of the geographical location. Depending on the position settings, updates will be propagated to the latitude, longitude, and MLS grid square. Continuous updates will continue until canceled. It should be noted that active continuous updates will continue across WoAD being closed and reopened.

This option will be disabled if a single update or continuous updates is already active.

© 2019-2025 Sumus Technology Limited

Cancel updates

Cancel a single update or continuous updates.

This option will be disabled if neither a single update nor continuous updates are currently active.

Post to Outbox

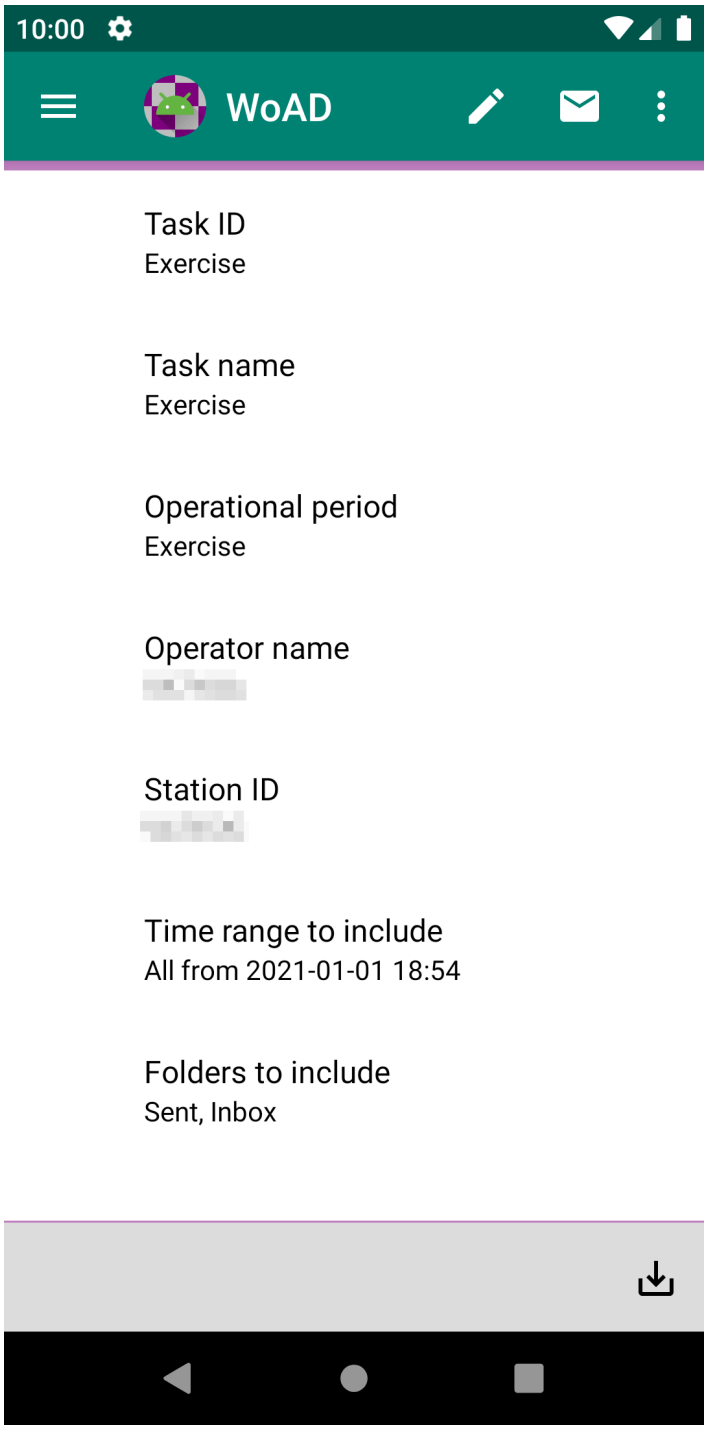
Post position report to the Outbox.

Reset

Reset the marine weather fields to their default values.

© 2019-2025 Sumus Technology Limited

Summarize (ICS 309)



© 2019-2025 Sumus Technology Limited

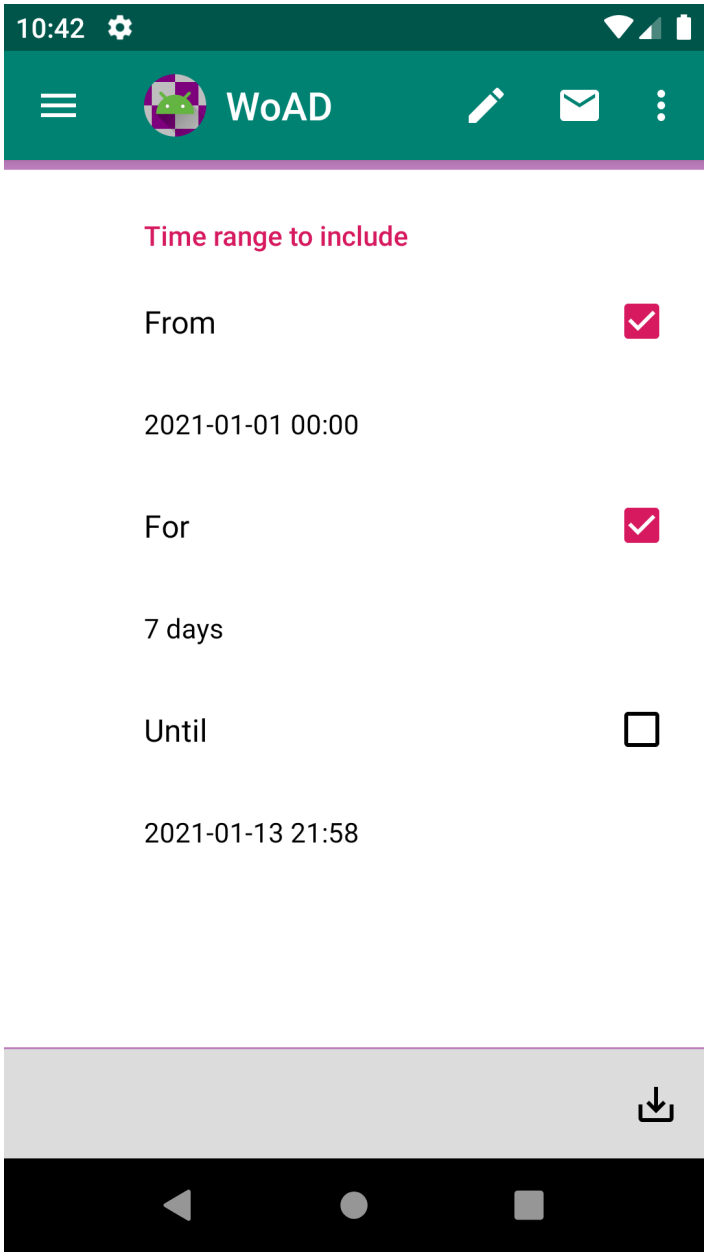
The Summarize (ICS 309) screen saves a summary of the messages in the ICS 309 format. The output file is exported as a PDF file, when running on Android 4.4 (KitKat) and newer, else it is saved as a CSV file.

Task ID
Task name
Operational period
Operator name
Station ID

All of the above are saved as part of the output file.

Time range to include

© 2019-2025 Sumus Technology Limited



Specifies the time range for messages to include in the summary:

- If no items are checked then there is no time restriction on the messages included
- If **From** is checked then only messages after the specified date will be included
- If **Until** is checked then only messages before the specified date will be included
- If **For** is checked then only messages within the specified interval will be included. The specified interval is defined relative to either the **From** date (if checked), the **Until** date (if checked) or the present date (if neither **From** nor **Until** is checked)
- Note that it is not possible to have all of **From**, **For**, and **Until** checked at the same time

Folders to include

© 2019-2025 Sumus Technology Limited

Only messages from the checked folders will be included in the summary. The folders include all the standard folders, as well as any user-defined tags.

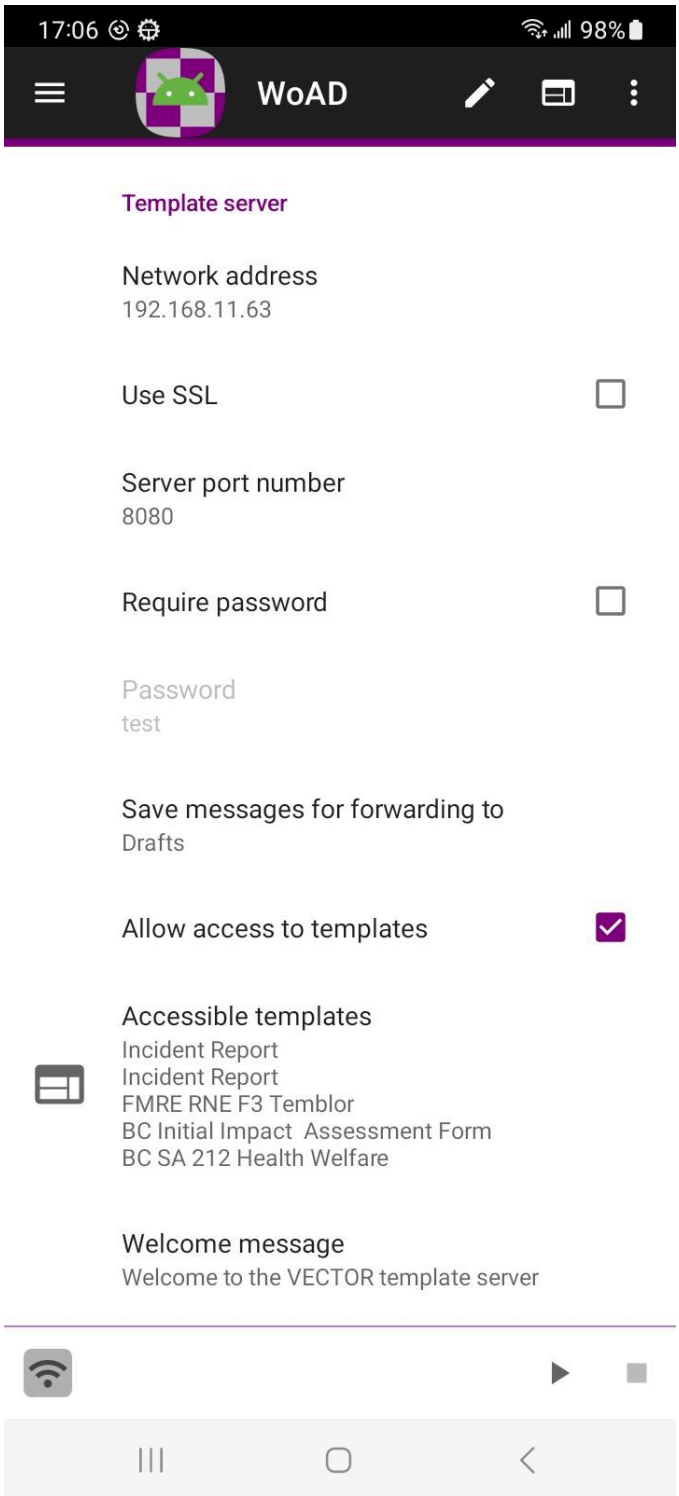
Menu

Export

Export the ICS 309 log subject to the values specified.

© 2019-2025 Sumus Technology Limited

Template Server



© 2019-2025 Sumus Technology Limited

The Template Server provides a mechanism for messages to be added to the Outbox or Drafts folder via a device connected to WoAD through an http(s) connection. This allows for one or more individuals to create messages for transmission from WoAD, without tying up the Android device. The Template Server can be configured to show a custom welcome message to the remote user and allow access to selected templates for message creation.

Changing the network address, SSL setting, or server port number will not be reflected if the server has already been started. To apply the changes stop and then start the server. All the other settings will take effect without the need to restart.

Network address

The network address can be selected from a list of all available network interfaces.

Selecting the loopback address (127.0.0.1) will allow the Template Server to be accessed from only the device running WoAD.

Use SSL

If checked the connection will be secure (https instead of http). This uses a self-signed certificate which will likely require the browser being used to connect to the WoAD server to be configured to accept the certificate.

Server port number
Secure server port number

The port number to be used for the (secure) server.

If not using the secure server the remote browser would connect to:
`http://<Network address>:<Server port number>`
e.g. `http://192.168.11.63:8080`

If using the secure server the remote browser would connect to:
`https://<Network address>:<Secure server port number>`
e.g. `https://192.168.11.63:8443`

Require password
Password

If **Require password** is checked the user of the remote browser will be prompted to provide the specified password as part of the initial identification.

© 2019-2025 Sumus Technology Limited

Save messages for forwarding to

Messages created remotely can be added to either the Outbox of Drafts folder. The former could be used when there is high confidence that the messages created are ready for transmission, while the latter would be used if the messages created need to be checked prior to transmission.

Allow access to templates
Accessible templates

If **Allow access to templates** is checked then the templates listed under **Accessible templates** will be available for selection by the remote user. The remote user will also be able to create a message from a blank form.

If **Allow access to templates** is unchecked then the remote user will create a message from a blank form.

Welcome message

The welcome message supplied will be displayed to the remote user on the initial identification page.

Menu

Start

Start the HTTP server to which the remote user will connect.

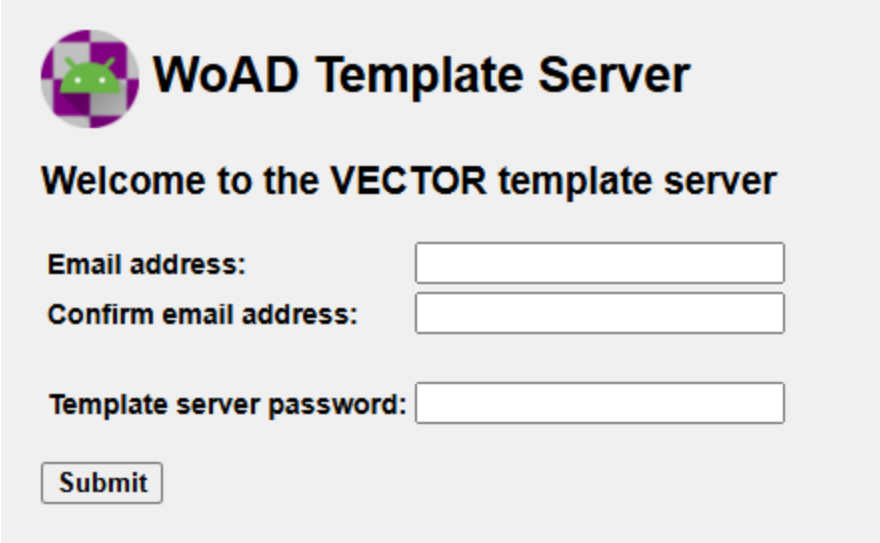
Stop

Stop the HTTP server. Keep in mind that this will terminate all connections from remote users.

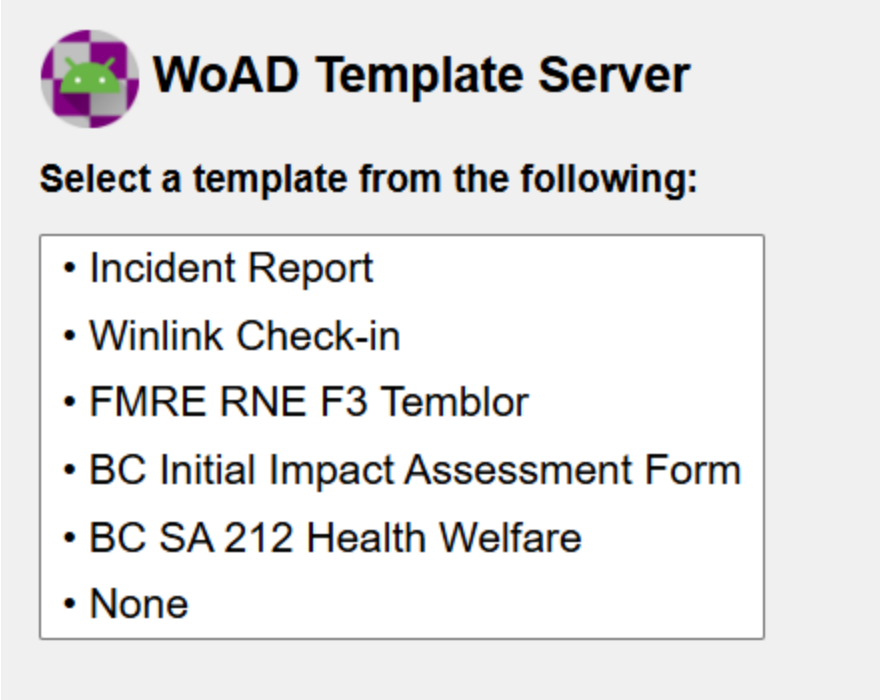
Usage

The interface presented to the user will depend in part on the configuration of the template server within WoAD. However, the basic steps are as follows:

© 2019-2025 Sumus Technology Limited



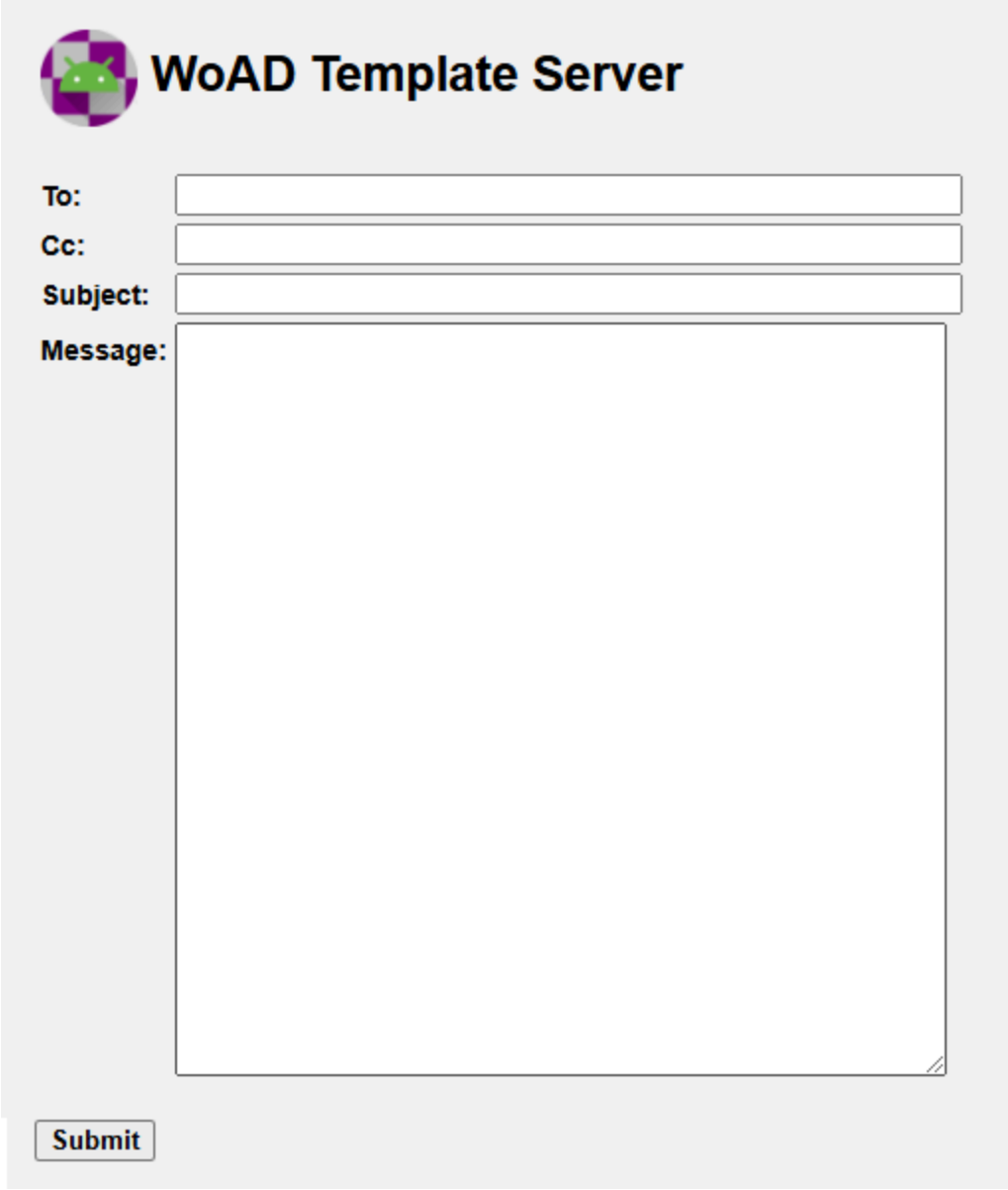
Enter and confirm an email address. This is added to the list of recipients on any message created. If configured the user must also enter the password specified in the server configuration.



Select the desired template or **None** to create a message from a blank form. If no templates have been configured to be accessible then the user will be taken directly to the blank form.

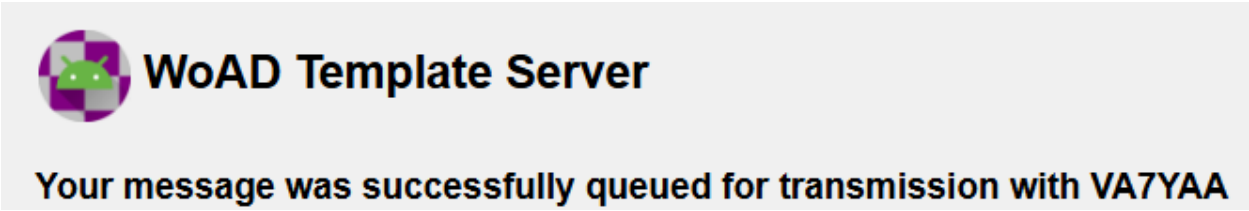
© 2019-2025 Sumus Technology Limited

If the remote user selects a template with an associated form that form will be displayed for completion by the remote user.



Fill in the fields for the message (which will be at least partially filled if a template was previously selected) and then click on **Submit**.

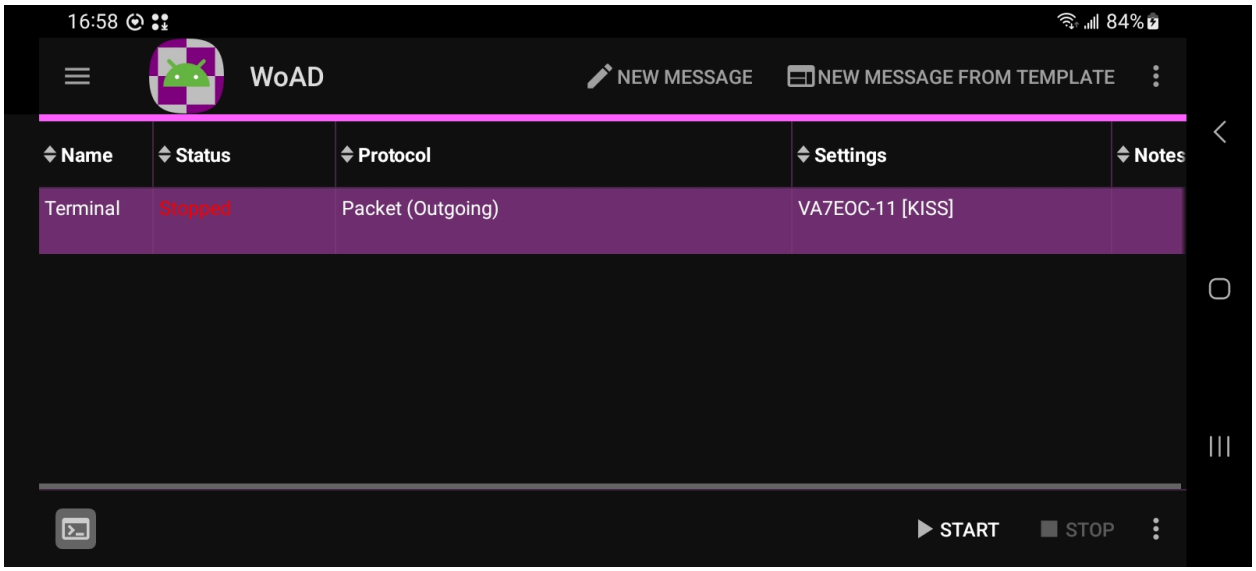
© 2019-2025 Sumus Technology Limited



After the message is successfully submitted and added to the Outbox or Drafts folder of WoAD, a confirmation message is displayed to the user.

© 2019-2025 Sumus Technology Limited

Terminals



A terminal provides an interactive session to a remote server such as a BBS. A terminal is not intended to interact with the Winlink Global Radio E-mail® system.

A terminal can be in one of three states, indicated by the **Status** column:

- **Running**
- **Stopping**: The terminal is transitioning out of the **Running** state. Depending on the terminal protocol a terminal may remain in this state for only a very brief interval
- **Stopped**

Columns

Name

The name given to the terminal.

Status

The terminal's status. This is one of: **Stopped**, **Running**, or **Stopping**

Protocol

The terminal protocol.

© 2019-2025 Sumus Technology Limited

Settings

A summary of the terminal settings.

Notes

Any notes assigned to the terminal.

Menu

Start

Start the selected terminal. This menu item will be disabled if no terminal is selected, or if the terminal is already **Running**. The Terminal screen will be opened when the terminal enters the **Running** state.

Stop

Stop the selected terminal. This menu item will be disabled if no terminal is selected, or if the terminal is already **Stopped**.

For some terminal protocols there may also be a discernible **Stopping** state, during which the terminal is politely terminated, usually involving a conversation with the remote end of the protocol. If **Stop** is pressed while in this state the terminal will be terminated abruptly and enter the **Stopped** state.

Edit

Open the New/Edit Terminal screen to edit an existing terminal. If the terminal is **Running** then the terminal screen will be opened instead.

Terminal

Open the terminal screen associated with the selected terminal.

Add

Open the New/Edit Terminal screen to create a new terminal.

© 2019-2025 Sumus Technology Limited

Copy

Create a copy of the selected terminal. The newly created terminal will be called **<Terminal> – Copy**, where **<Terminal>** is the name of the selected terminal that was copied.

In the event that there is already a terminal called **<Terminal> – Copy** then it will be called **<Terminal> – Copy (<n>),** where **<n>** is the smallest positive integer value that results in a unique terminal name.

Delete

Delete the selected terminal. A terminal can only be deleted when it is **Stopped**. This menu item will be disabled if no terminal is selected, or the selected terminal is not **Stopped**.

Refresh

Refresh the list of terminals and their associated states. Under normal circumstances this should never be needed.

Export

Exports all terminals to an xml file. This is intended primarily for assistance with resolving connection problems. All the terminals will be saved in a single xml file to the export location. The file will be called `WoAD_terminals_<yyyy-MM-dd HH:mm:ss>.xml`, where `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_terminals_2023-11-05 20_49_33.xml`

New/Edit Terminal

Menu

The menu is similar to that for New/Edit Session, with the addition of:

Terminal

Open the terminal screen associated with the selected terminal.

© 2019-2025 Sumus Technology Limited

Settings

The editing of a terminal is similar to editing a session, but the **Type** and **Auto-connect** options are absent, as they do not make sense in the context of an interactive terminal.

Name

The name of the terminal. The name must be unique.

Protocol

The protocol can be one of:

- Telnet
- Packet
- ARDOP.1
- VARA HF
- VARA FM

Settings

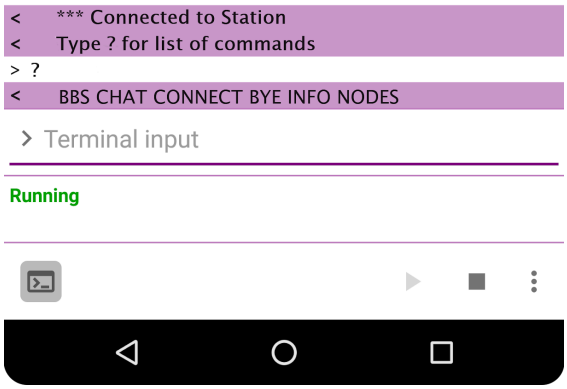
The terminal settings are contingent on the protocol selected. The settings are described in the Terminal Settings section.

Notes

Notes assigned to the terminal.

© 2019-2025 Sumus Technology Limited

Terminal



The terminal screen, from top to bottom, consists of the:

- Terminal log: with the incoming messages highlighted and prefixed by **<** and and the outgoing messages prefixed by **>**
- Terminal input: enter text here to be transmitted
- Terminal status: status of the current terminal

© 2019-2025 Sumus Technology Limited

Menu

Start

Start the current terminal. This menu item will be disabled if the terminal is already **Running**.

Stop

Stop the current terminal. This menu item will be disabled if the terminal is already **Stopped**.

Scroll to end

Set the terminal log to automatically scroll to the end of the log entries.

Clear

Clear the terminal log.

Export

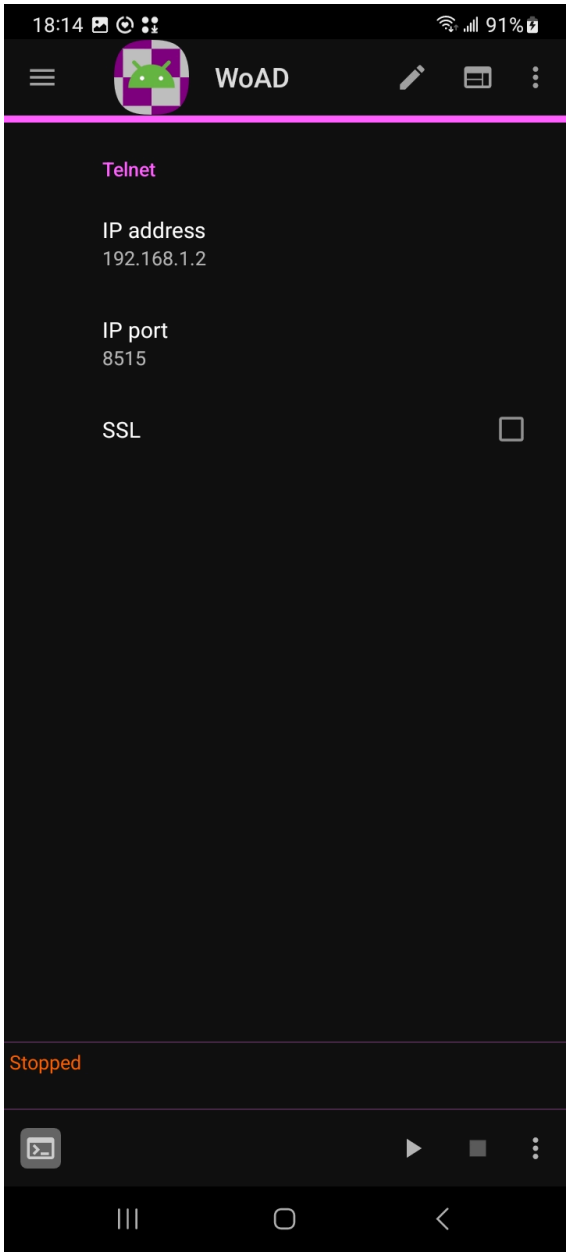
Export the terminal log. The terminal log will be saved in an xml file to the export location. The file will be called `WoAD_terminal_log_<yyyy-MM-dd HH:mm:ss>.xml`, where `yyyy`, `MM`, `dd`, `HH`, `mm`, and `ss` represent the UTC year, month, day, hour, minute, and seconds respectively, *e.g.* `WoAD_terminals_2023-11-05 20_49_33.xml`

Terminal Settings

The terminal settings are similar to the available Session Settings, except that the Telnet Winlink and Telnet P2P options are replaced by the single Telnet option, described below:

Telnet

© 2019-2025 Sumus Technology Limited



IP address
IP port

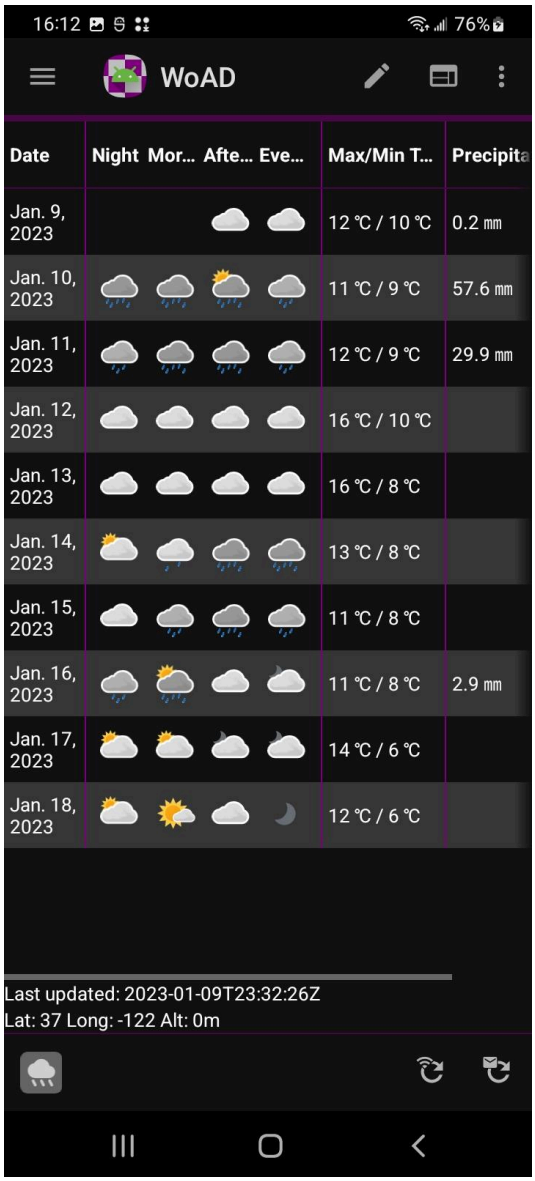
The IP address and port used to connect to the BBS.

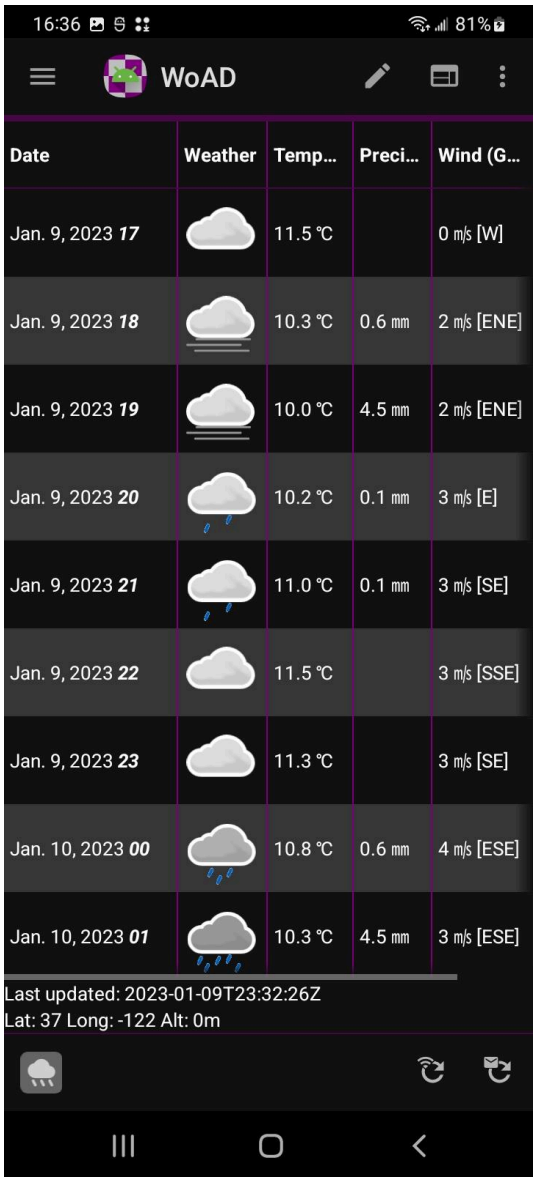
SSL

Whether or not the BBS requires an SSL connection.

© 2019-2025 Sumus Technology Limited

Weather





The Weather screen displays the current weather forecast, if any, courtesy of MET Norway. The various columns provide the date, predicted temperature, precipitation, wind, *etc*. Tapping on a row of the daily forecast will open the corresponding hourly forecast.

It is important to note that there are restrictions, imposed by MET Norway, on how often a weather forecast can be requested and WoAD makes every effort to honor those restrictions.

The forecast requested is for the latitude and longitude specified in the Position report screen.

© 2019-2025 Sumus Technology Limited

Last Updated

The time at which the current weather forecast was acquired.

Lat, Long, Alt

The location for the current weather forecast.

Menu

Update via internet

Updates the current weather forecast through an internet connection.

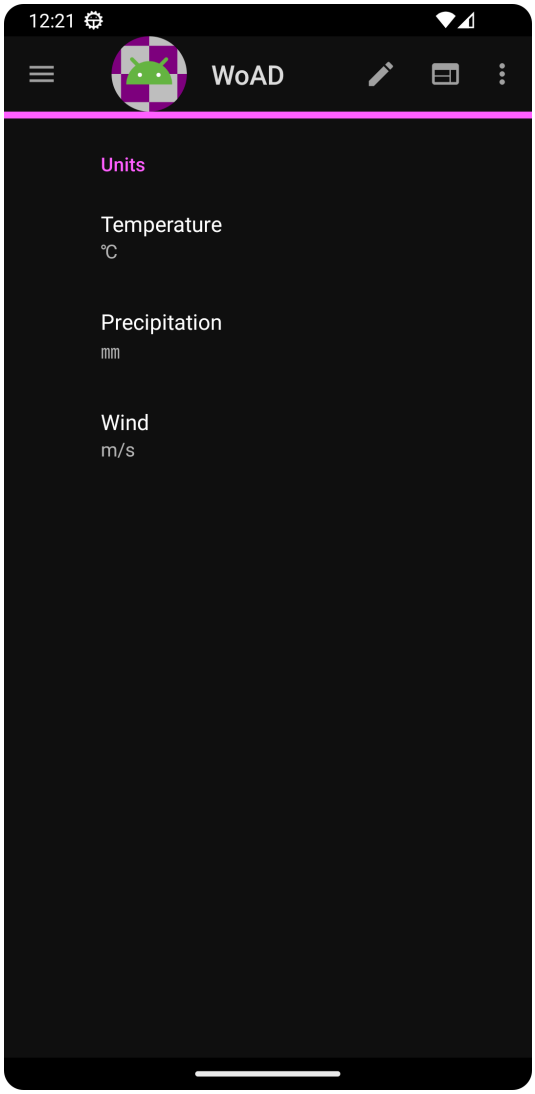
Update via message

Updates the current weather forecast through an outgoing message. A message will be created and posted to the Outbox, after which the message can be sent by running an appropriate session. The reply with the requested weather forecast will be created, which can take a few minutes under normal circumstances, and can be retrieved by running an appropriate session. **Note that weather update requests may be ignored if the system is being overloaded.**

Settings

Opens the weather settings screen and allows configuration of the units used to report the weather.

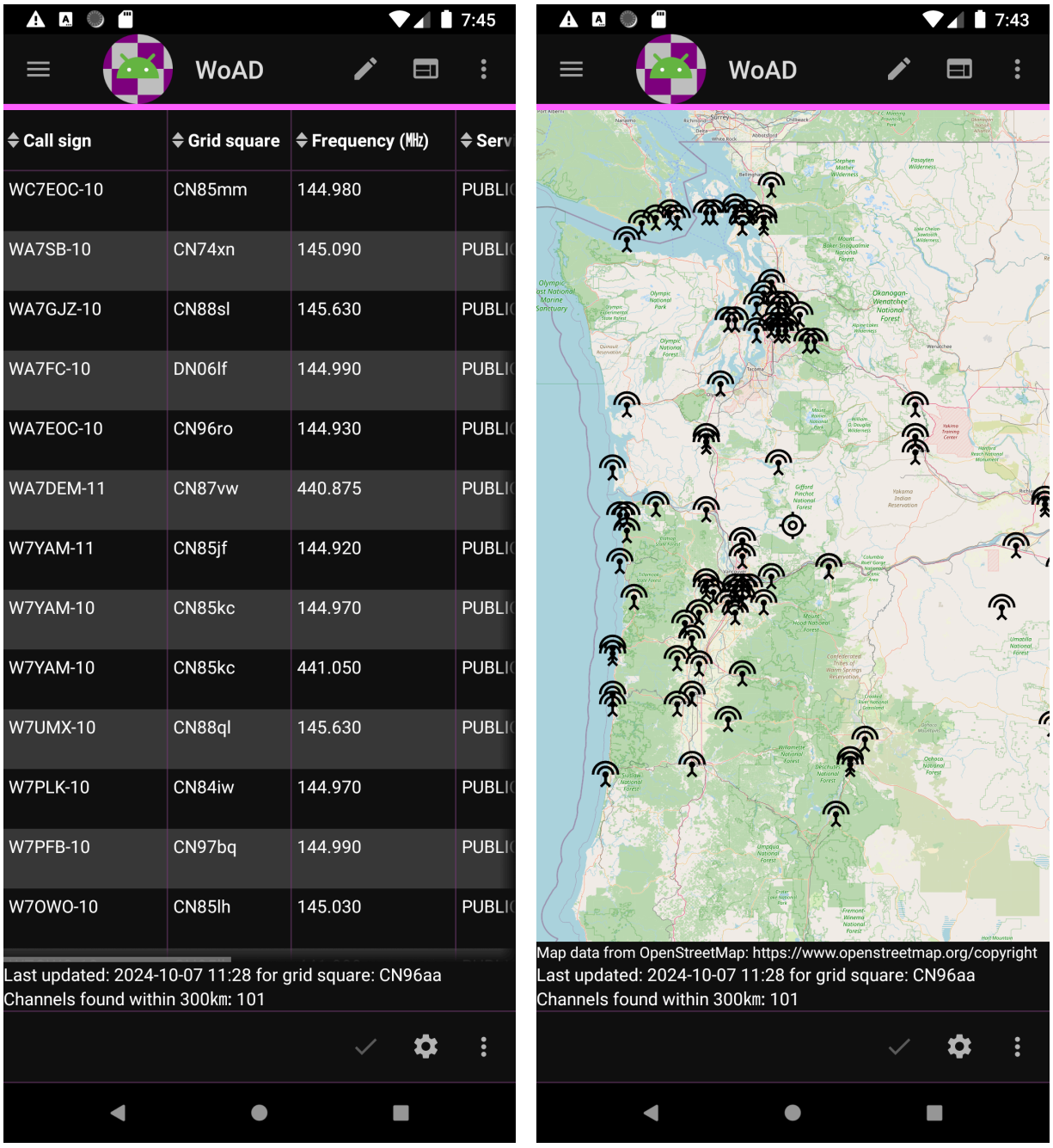
© 2019-2025 Sumus Technology Limited



- Temperature can be one of ℃, ℉
- Precipitation can be one of **mm**, **cm**, **in**
- Wind can be one of **m/s**, **km/h**, **ft/s**, **mph**

© 2019-2025 Sumus Technology Limited

RMS Channel Selection



The **RMS Channel Selection** screen is always opened from within the settings of an outgoing session, specifically the destination address screen. It allows the selection of an RMS Channel that matches the protocol of the session. The selected RMS Channel will override any destination address information that might have already been entered.

© 2019-2025 Sumus Technology Limited

The channels shown will depend on the protocol of the session being edited, allowing only the selection of a relevant channel. In addition in the case of a Packet session, only those stations within a certain distance will be displayed - making it important that the **MLS grid square** found in the **Position Report** screen is correctly set.

The list of available channels is made available by the Winlink Team of volunteers and can be found at winlink.org/RMSChannels.

Columns

Call sign

The call sign, including SSID, of the RMS channel

Grid square

The MLS grid square of the RMS channel

Frequency (MHz / kHz)

The center frequency of the RMS channel

Service code

The service code of the RMS channel

Distance (km)
Bearing

The distance and bearing are calculated from the grid square of the RMS channel together with the user's grid square, specified in the Position Report screen. The distance and bearing of each RMS channel are automatically updated if the user's grid square changes

Operating hours
Baud
Protocol

All basic properties of the RMS channel

© 2019-2025 Sumus Technology Limited

Menu

✓ Select

Selects the currently highlighted RMS channel and closes the screen.

⚙ Service Codes

This screen can be used to specify the service codes of interest. Every RMS channel has an associated service code, which identifies the channel usage (the following is taken from winlink.org/RMSChannels):

- **PUBLIC** is the service code for maritime and open amateur radio use, including emergency gateways that are open to the public
- **EMCOMM** is for emergency gateways that do not allow public access
- **Other** codes are used by groups who wish to keep gateway information private. If your group uses a special service code, please contact your group to obtain it. The Winlink Team does not distribute that information

When entering multiple **other** service codes, separate them with either a new line or a space.

If the service code settings are modified, then the list of active channels should be updated so that it reflects the service codes of interest.

The list of RMS channels in a newly installed WoAD is empty, so it must be updated at least once to be able to select an RMS channel. The date that the list was last updated is given by the **Last updated** field, where a dash, -, indicates that the list has never been updated.

🌐 View on map
☰ View as list

Switches between a list view and map view of the available RMS channels.

To select an RMS channel from the list view, tap on the desired RMS channel and then tap on ✓ **Select** in the lower menu or long-tap on the desired RMS channel.

To select an RMS channel from the map view, tap on the desired RMS channel and then tap on ✓ **Select** in the lower menu or tap in the info window of the RMS channel.

© 2019-2025 Sumus Technology Limited

Update via internet

Updates the list of active channels using an internet connection. Channels are updated for all modes.

Update via message

Updates the list of active channels via a message sent to the Winlink servers and the subsequent response. Only the channels using the mode of the current session will be updated. Be aware that the response from the Winlink server can be a large message, so you are strongly recommended to update via the internet whenever possible.

© 2019-2025 Sumus Technology Limited

Appendices

Export

Exporting refers to the saving of files from WoAD, allowing them to be used by other apps. Items that can be exported include messages, attachments, logs, sessions, and the ICS 309 summary. The exact behavior depends on the version of Android that is being run:

- For Android 5.0 (Lollipop, API 21) and later the exported files will be saved to a location specified by the user. This location can be specified in the Settings, or will be queried for when needed if not already set.
- For pre-Android 5.0 the exported files will be saved to WoAD's external storage folder. This will typically be something like Android/data/com.sumusltd.woad.

© 2019-2025 Sumus Technology Limited

Message Template Reference

Messages templates are `.txt` files located either in the **standard templates** folder or in the **other templates location**. The latter can be set from **Settings** → **Message Template** → **Other templates location**.

Commands

All commands are optional and can appear in any order, with the exception of the **Msg:** command, which, if it is present, must be the last command of the template.

Command	Parameter(s)	Description
`To:`	addresses	populate the **To** field, *e.g.* `To:user1@gmail.com; user2@gmail.com`
`Cc:`	addresses	populate the **Cc** field, *e.g.* `Cc:otheruser@gmail.com`
`Subj:`	subject	populate the **Subject** field, *e.g.* `Subj:Daily status report`
`Attach:`	file1[,file2…]	attach one or more files to the message, *e.g.* `Attach: /sdcard/file1.txt, /sdcard/image.png`
`SeqSet:`	value	set the sequence number to the specified value, *e.g.* `SeqSet: 0`
`SeqInc:`	value	increment the sequence number by the optional value. If no value is given the command must be terminated by a colon and a value of 1 is assumed. The increment may be negative. *e.g.* `SeqInc: 1`
`Readonly:`	Yes|No (True|False)	If set to Yes (or True), then the message created by the form cannot be edited by the user.
`Def:`	variable=value	define a variable and assign a value to it. The value may contain tag fields such as <ask> and <select>. The value of a variable can be inserted into a message by using the <var variable> template insertion tag. *e.g.*

© 2019-2025 Sumus Technology Limited

		• `Def: mycallsign=W4PHS` • `Def: mycallsign=<ask Callsign:,UP>` • `Def: statecode=<select Alabama=AL,Georgia=GA,Tennessee=TN>`
`Form:`	input[,display]	specify the names of the HTML input and display forms that are to be used to accept input data and display the message on the receiving end. See HTML Forms for further information.
`ReplyTemplate:`	template	specify the name of the template to be invoked on the receiving end when a reply is created for this message. This command only has meaning when used in conjunction with a **Form** command.

`Msg:`	message body	populates the message body. This command, if present, must be the last command of the template file and is the only command that can span multiple lines.*e.g.*
		`Msg:Here is today's status`
		`Total number of messages handled:`
		`Number of hours on station:`
		`My current location is: <GPS>`
		`Regards,`
		`<Callsign>`

Insertion Tags

Insertion tags are enclosed by angle brackets, '<' and '>'. When an insertion tag is encountered, it is replaced by the corresponding value.

Date and Time tags:

Tag	Description
`DateTime`	the current local date and time, *e.g.* `2020-07-12 17:13:05`
`UDateTime`	the current UTC date and time, *e.g.*

© 2019-2025 Sumus Technology Limited

	`2020-07-13 00:13:05Z`
`Date`	the current local date, *e.g.* `2020-07-12`
`UDate`	the current UTC date, *e.g.* `2020-07-12Z`
`Time`	the current local time, *e.g.* `17:13:05`
`UTime`	the current UTC time, *e.g.* `00:13:05Z`
`Day`	the current local day of week, *e.g.* `Tuesday`
`UDay`	the current UTC day of week, *e.g.* `Wednesday`
`UDTG`	the current UTC military style date-time group, *e.g.* `241205Z NOV 2020`

Location tags:

Tag	Description
`GPS`	the current GPS location (if available), *e.g.* `46-22.77N 121-35.01W`
`GPS_DECIMAL`	the current GPS location (if available), *e.g.* `46-22.77N 121-35.01W`
`GPS_SIGNED_DECIMAL`	the current GPS location as a signed decimal latitude/longitude (if available), *e.g.* `46.3795 -121.5835`
`GPSLatitude`	the current GPS latitude (if available), *e.g.* `46.3795`
`GPSLongitude`	the current GPS longitude (if available), *e.g.* `-121.5835`

© 2019-2025 Sumus Technology Limited

GPSValid	"True" or "False" depending on whether a GPS position is available.
GridSquare	the current MLS grid square as given in the Position Report screen. *e.g.* *PN19ng*
Latitude	the current latitude as given in the Position Report screen. The value returned will be between -90 and 90. *e.g.* `46.3795`
Longitude	the current longitude as given in the Position Report screen. The value returned will be between -180 and 180. *e.g.* `-121.5835`
Position	the current GPS location if available or the last reported position if GPS position is not available. This can be used to insert a position manually entered on the Position Report screen. *e.g.* `46-22.77N 121-35.01W`

Message property tags:

Tag	Description
MsgIsReply	"True" or "False" depending on whether the message being entered is a reply to another message.
MsgIsForward	"True" or "False" depending on whether the message being entered is being forwarded.
MsgIsAcknowledgement	"True" or "False" depending on whether the message being entered is an acknowledgment to another message.
MsgSender	Inserts the callsign, including SSID, of the message sender

For each of the following the insertion tag only makes sense if the message is a response to an original message. The response can be a reply, forward, or acknowledgement. If the message is a new message then the insertion is blank.

Tag	Description

© 2019-2025 Sumus Technology Limited

MsgOriginalSubject	the subject of the original message.
MsgOriginalSender	the address of the sender of the original message.
MsgOriginalBody	the body of the original message.
MsgOriginalID	the message ID of the original message. *e.g.* `TQK27Z758R5W`
MsgOriginalDateTime **MsgOriginalLocalDateTime**	the local date and time of the original message, *e.g.* `2020-07-12 17:13:05`
MsgOriginalUtcDateTime **MsgOriginalUDateTime**	the UTC date and time of the original message, *e.g.* `2020-07-13 00:13:05Z`
MsgOriginalDate **MsgOriginalLocalDate**	the date-time of the original message, *e.g.* `2020-07-13`
MsgOriginalUtcDate **MsgOriginalUDate**	the UTC date of the original message, *e.g.* `2020-07-12Z`
MsgOriginalTime **MsgOriginalLocalTime**	the local time of the original message, *e.g.* `17:13:05`
MsgOriginalUtcTime **MsgOriginalUTime**	the UTC time of the original message, *e.g.* `00:13:05Z`
MsgOriginalDTG **MsgOriginalUDTG**	the date-time of the original message in the format of a military date-time group *e.g.* `241205Z NOV 2020`
MsgOriginalSize	the size of the original message.
MsgOriginalAttachmentCount	the number of attachments to the original message.
MsgOriginalXML	the XML code with the form data, if any, that was attached to the original message.

Miscellaneous tags:

Tag	Description
SeqNum	the current value of the sequence number. *e.g.*

© 2019-2025 Sumus Technology Limited

	`003`
`ProgramVersion`	the current WoAD version, *e.g.* `1.3.12`
`Callsign`	the user's call sign, as given in the Settings screen
`Var` `variable`	the value assigned to a variable by a **Def** statement. *e.g.* `<var statecode>`

Query tags:

The following two insertion tags seek user input at the time that the message is created.

Tag	Description
`Select` *`prompt,item1[=value1],[item2[=value2]]...`*	Displays the **prompt** and a drop-down selection list of the **item**s. If an **item** is followed by an equal sign and another string, then the value after the equal sign is returned as the value when the item is selected. If there is no equal sign after an item, then the item text is returned for the selection. If you want to use a comma in a ***value***, enclose the value within quote marks. *e.g.* • `<select What type of operator are you:,Ham,MARS>` • `<select Which state do you live in:,Alabama=AL,Georgia=GA,Tennessee=TN>`
`Ask` *`prompt,options`*	Prompts the user to enter the value that will be inserted into the form. **Prompt** is the string to display to prompt for the field. If you want to use a comma in the **prompt** string, enclose the **prompt** within quote marks

© 2019-2025 Sumus Technology Limited

	Options are parameters affecting the input. If **options** are specified, separate them from the **prompt** string with a comma, and use commas to separate multiple **options**. You can spell out the full option keywords, but only the first two characters are significant. . The following options may be used: • **UP***PERCASE* — force input for the field to be upper-case characters. Typically this is used to accept call signs. • **MU***LTILINE* — accept a multi-line, free-form text field. If this isn't specified, a single-line field is accepted. *e.g.* • `<Ask Your callsign:,UP>` • `<Ask "Name, Position">` • `<Ask Time of incident (hh:mm UTC):>` • `<Ask Description of incident:,MU>`

HTML Forms

WoAD supports using HTML forms for requesting input from users. This is similar to using the **select** and **ask** fields in templates, but provides the full power of HTML, The HTML forms are stored locally to avoid a dependence on an internet connection.

Information entered through a form can be inserted into the message by using **`<var...>`** fields in a template. Optionally, the information can be packaged into an XML file and sent to the recipient. Assuming the receiving client has the necessary functionality, the attached XML file will be recognized as form data, and will be displayed using the appropriate HTML form.

Note: Insertion tags can also be used in HTML forms. When using insertion tags in a form, enclose the tag with "{" and "}" characters rather than "<" and ">". For example: {Callsign}.

Additional Input Fields

The functionality of HTML forms can be extended through the creation of additional input fields.

© 2019-2025 Sumus Technology Limited

Field	Description
`attached_file` **`attached_text`**	If both these fields are present then the value of **`attached_text`** is saved as an attachment, with the attachment name given by the value of **`attached_file`**, to the message. *e.g.* `if` **`attached_file = FormData.txt`** and **`attached_text = some meaningful text`** then the message will be created with an attachment named FormData.txt, whose contents are: some meaningful text

Load/Save Form Data

Many of the standard templates with associated HTML forms allow you to save and load the form data to and from file. The location of these files is specified in **Settings** → **Message Template** → **Form data location**.

Clicking on the **Save** button in an enabled form will prompt you for the file name, with a suitable default already supplied. The file will be saved in the location specified by **Settings** → **Message Template** → **Form data location**.

Clicking on the Load button in an enabled form will present a list of files found at the location specified by **Settings** → **Message Template** → **Form data location**. Selecting a file will load the data into the form. Swiping (flinging) left or right on a file will delete it.

© 2019-2025 Sumus Technology Limited

Acknowledgements

Sumus Technology Limited gratefully acknowledges the following for helping to make this project possible.

Winlink Express Forms

https://www.winlink.org/WinlinkExpressForms

All form template code is unlicensed open-source, in the public domain.

Android USB host serial driver library

https://github.com/mik3y/usb-serial-for-android

MIT License
Copyright © 2011-2013 Google Inc.
Copyright © 2013 Mike Wakerly

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

- The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.
- THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Weather data and associated icons

Provided by the Norwegian Meteorological Institute (MET Norway) under the Norwegian License for Open Government Data (NLOD) 2.0 (https://data.norge.no/nlod/en/2.0/) and Creative Commons 4.0 BY International licenses (http://creativecommons.org/licenses/by/4.0).

https://www.yr.no/en

Java WebSockets

https://github.com/TooTallNate/Java-WebSocket/

MIT License
Copyright (c) 2010-2020 Nathan Rajlich

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

- The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.
- THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

LA3QMA

PC RIG control commands for Kenwood TH-D72, TH-D74, and TM-D710.
https://github.com/LA3QMA/

osmdroid

OpenStreetMap-Tools for Android

https://github.com/osmdroid
https://github.com/osmdroid/osmdroid/blob/master/LICENSE

Map data from OpenStreetMap: https://www.openstreetmap.org/copyright

© 2019-2025 Sumus Technology Limited

NanoHTTPD

https://github.com/NanoHttpd/nanohttpd

Copyright (c) 2012-2013 by Paul S. Hawke, 2001,2005-2013 by Jarno Elonen, 2010 by Konstantinos Togias. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the NanoHttpd organization nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

LZHUF Compression Routine

lzhuf.c
written by Haruyasu Yoshizaki 11/20/1988
some minor changes 4/6/1989
comments translated by Haruhiko Okumura 4/7/1989

Material Icons

Some icons courtesy of https://fonts.google.com/icons

Licensed under the Apache License, Version 2.0 (the "License"); you may not use these resources except in compliance with the License.

You may obtain a copy of the License at http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

FFT Routines

https://www.nayuki.io/page/free-small-fft-in-multiple-languages

Copyright © 2017 Project Nayuki. (MIT License)

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

- The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software
- The Software is provided "as is", without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for a particular purpose and noninfringement. In no event shall the authors or copyright holders be liable for any claim, damages or other liability, whether in an action of contract, tort or otherwise, arising from, out of or in connection with the Software or the use or other dealings in the Software.

Gson Library

https://github.com/google/gson

Copyright 2008 Google Inc.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License.

You may obtain a copy of the License at http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

UriCodec

https://android.googlesource.com/platform/frameworks/base/+/master/core/java/android/net/UriCodec.java

Copyright (C) 2015 The Android Open Source Project

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License.

You may obtain a copy of the License at http://www.apache.org/licenses/LICENSE-2.0
Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

See the License for the specific language governing permissions and limitations under the License.

© 2019-2025 Sumus Technology Limited

Glossary

AFSK	Audio Frequency-Shift Keying
APRS	Automatic Packet Reporting System (was Automatic Position Reporting System)
APRS-IS	Automatic Packet Reporting System-Internet Service
ARDOP	Amateur Radio Digital Open Protocol
AREDN	Amateur Radio Emergency Data Network
ARQ	Automatic Repeat Query/Request
Auxiliary call sign	A normal Winlink call sign account used as a secondary address for sending and receiving messages
AX.25	Data link layer protocol derived from layer 2 of the X.25 protocol suite and designed for use by amateur radio
BBS	Bulletin Board System
BER	Bit Error Rate
BLE	Bluetooth Low Energy. A specification for KISS over BLE can be found at https://github.com/hessu/aprs-specs/blob/master/BLE-KISS-API.md
Bluetooth	A short-range wireless technology standard
BPS	Bits Per Second
BPSK	Binary Phase-Shift Keying
B2F	An extension of the original FBB amateur packet radio protocol
Call sign	Used to legally identify an amateur radio station or operator. Prefixes are assigned internationally, and a separating numeral plus suffix are added by a national body to produce this unique identifier.*
CAT	Computer Aided Transceiver
CMS	Common/Central Message Server

© 2019-2025 Sumus Technology Limited

CSV	Comma-Separated Values
DCS	Digital Coded Squelch
CTCSS	Continuous Tone Coded Squelch System
Digipeater	Digital repeater
Duplex	Two frequencies are used, one to transmit and one to receive. Full duplex allows reception and transmission to occur simultaneously. See also Simplex.
EML	Filename extension used for an email message saved as plain text in the MIME format
FBB	Bulletin board software and protocol for amateur packet radio
FEC	Forward Error Correction
FSK	Frequency-Shift Keying
FX.25	Extension to the AX.25 Link Layer Protocol providing FEC capability
GPIO	General-purpose input/output
GRIB	GRIdded Binary or General Regularly-distributed Information in Binary form
HF	High Frequency
HTML	HyperText Markup Language
ICS	Incident Command System
IRS	Information Receiving Station
ISS	Information Sending Station
KISS	A protocol for communicating with a TNC device
LFSR	Linear Feedback Shift Register. Used in FSK to minimize the chance of a long run of 0's or 1's.
MGRS	Military Grid Reference System
MLS	Maidenhead Locator System
OFDM	Orthogonal Frequency-Division Multiplexing

© 2019-2025 Sumus Technology Limited

OTG	USB On-The-Go allows USB devices to act as a host, allowing other USB devices to be attached to them
P2P	Peer-to-peer connection
PDF	Portable Document Format
PSK	Phase-Shift Keying
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase-Shift Keying
RMS	Radio Mail Server
RMS Relay	Supplemental Winlink program that provides temporary storage of messages and local routing in the event internet access to the CMS sites is lost
RTS	Request to Send. Used for flow control in serial devices.
SFI	Solar Flux Index measured at 2800 MHz (10.7 cm) which acts as an indicator of the F layer ionization
SID	System Identifier. A SID is used to describe the connecting program, its version number, and capabilities, within the FBB protocol. An example would be [WL2K-5.0-B2FWIHJM$]. Further details can be found at https://www.f6fbb.org/
Simplex	Bi-directional communication on a single frequency with stations taking turns to receive and transmit. See also Duplex.
SSID	Secondary Station Identifier. A number between 0 and 15, defined as part of a station address within the AX.25 protocol.
SSL	Secure Sockets Layer
Tactical address	Used in the Winlink system for functional email accounts rather than accounts of specific individuals. More information can be found at https://winlink.org/content/tactical_addresses
TNC	Terminal Node Controller. A device used to interface between the digital signal of a computer and the audio signal of a radio being used for AX.25 packet communication
UHF	Ultra High Frequency
USB	Universal Serial Bus

© 2019-2025 Sumus Technology Limited

VHF	Very High Frequency
WA8DED	AX.25 Version 2 Multi-channel TNC Firmware
WoAD	Winlink on Android Devices
WHN	Winlink Hybrid Network
XML	eXtensible Markup Language

© 2019-2025 Sumus Technology Limited