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SCSmail

High Speed HF E-Mail System

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SCS

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1 Introduction

1.1 SCSmail, why another HF email program?

SCSmail has been developed to enable users of SCS PACTOR modems to easily establish an own email system without additional costs. SCSmail is freeware and is distributed via the SCS CD and the SCS website. It runs in an MS Windows (XP or later) environment and can be used as server and as client, which is decided simply with one mouse click in the setup. The main goal with the development of SCSmail was to make it easy to use. To achieve that, it uses a normal email client program (e.g. MS Outlook) that the user is accustomed to as front-end and interfaces it to the HF PACTOR system. With SCSmail any existent email account can be accessed via HF PACTOR for sending and receiving emails. SCSmail is also capable to administrate several host stations being available for email exchange and is able to control the HF transceiver to automatically hit the correct frequency.

It is not the intention of SCSmail to replace or to interfere with existing professional HF email providers with their highly sophisticated solutions and services. Its purpose is just to give private users and small organizations the chance to quickly install an own, private email service without additional costs and without the need to subscribe to an existing provider and thus being dependent from an external service.

1.2 SCSmail, general configuration

Just like all programs which work together with SCS PACTOR modems, SCSmail also needs to be configured with some very basic settings, which are:

- Own call sign
- Transceiver modulation levels (FSKA/PSKA)
- COM port setting
- Radio control settings, if applicable

1.3 SCSmail in client configuration

Just a few settings are necessary to use SCSmail as client:

- Name and access data for the POP3 account to be used for receiving mails
- Name and access data for the SMTP account to be used for sending mails
- Creating a list of one or more server stations being available (calls and frequencies)
- SCSmail server access password for authorization of the SCSmail system usage
- Creating a new email account in the standard email client called "***localhost***"

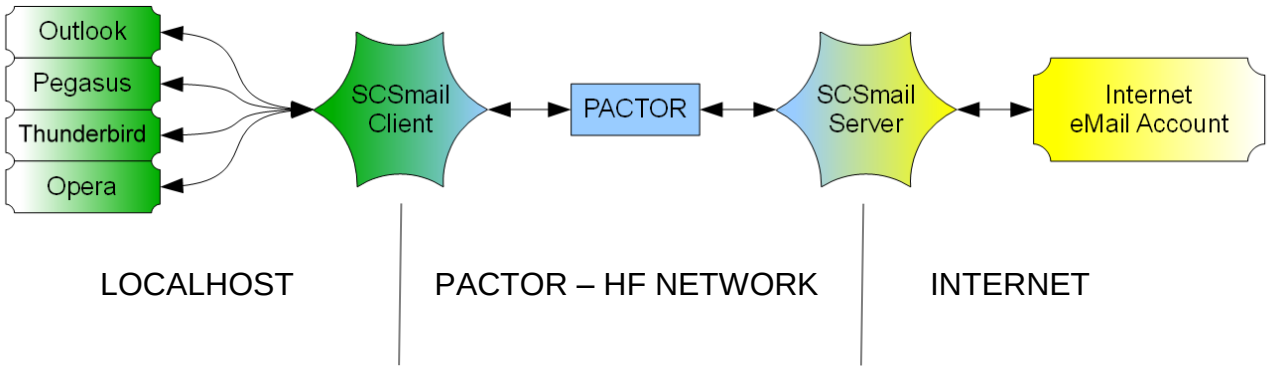
1.4 **SCSmail** in server configuration

Even fewer settings are necessary to use SCSmail as server.
Just the checkbox, ***Run SCSmail as server***, needs to be activated in the setup. Optionally, the following useful features are available to the SCSmail server operator:

- Create a list (names and passwords) of allowed clients.
- Create a list of (scanned) frequencies where the server can be reached over the air.

1.5 How **SCSmail** works

Flowdiagram of the SCSmail communication



Basically the internal communication between SCSmail and the HF email System can be divided into three sections:

1.5.1 LOCALHOST

In this section (green), emails coming via HF are accepted by the SCSmail client and handed over to the locally installed email client program. And, in opposite direction, mails being prepared by the locally installed email client are handed over to the SCSmail client, which stores them into a virtual mailbox until a connection to the SCSmail server via HF has been established.
This always happens via a TCP/IP connection between the email client and the SCSmail client. Mails are removed from the virtual mailbox after successful transfer to the SCSmail server side (yellow).

1.5.2 PACTOR – HF Network

Here (blue) mails are transferred wirelessly via HF/VHF PACTOR/Packet-Radio connection. Optionally, this connection can be encrypted (refer to Setup ***"Use Data Encryption"*** below).
The SCSmail server temporarily stores the mails before transferring them. In default configuration, all mails being available are transferred to the client side. But it's also possible to obtain an overview on the mails being available before transfer. This enables the user to selectively transfer mails or even delete them on the server side directly. This behavior can be configured in the "advance" menu of the setup screen.

1.5.3 INTERNET

Finally, this level of communication handles the email transfer between SCSmail email server and the service provider's server. In most cases this will happen over the Internet, but it can also be a private network (Intranet) or even the local computer, where an email server must have been installed by a skilled network administrator. The protocols for this communication are, as standard, POP3 / SMTP, or the encrypted SSL / TLS protocols. Only when all mails are confirmed as being transferred, they will be deleted.

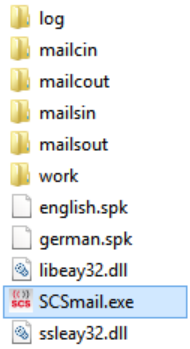
The functionality of SCSmail provides a large measure of individual solutions. Beginning with the opportunity to join worldwide email traffic, or to build a completely independent, secure email system without decentralized data storage in other hands, in case of needed.

2 The installation of SCSmail

SCSmail is delivered on the actual SCS CD. As the program develops continuously, we also recommend looking for the most recent release at the SCS website. All necessary program files are delivered in a ZIP archive ***(SCSmail.zip)***, which needs to be unzipped. To keep the program small, no installation routine is being used.

After unzipping the program in a separate folder *(SCSmail Vx.x.x.x)*, the ZIP archive is not needed any more and can be deleted.

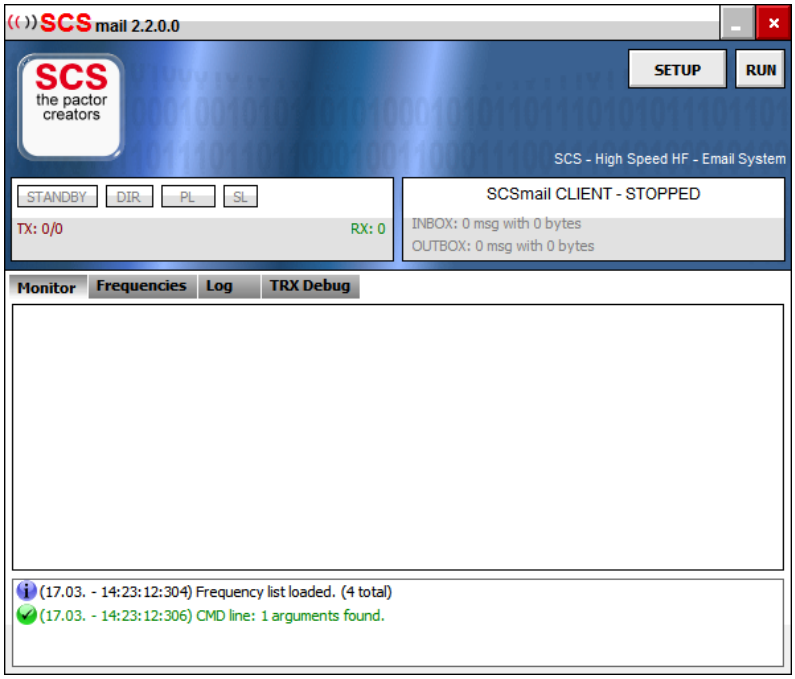
An installation on a mobile data carrier is also possible, as all settings are stored in the file ***settings.ini*** , which is contained by the same folder as the program itself.



Most of the folders appearing in the SCSmail folder are storage place for the virtual mailbox. If a needed folder does not exist, SCSmail will automatically create it at next program start. It is not recommended to edit the content of these folders manually, as destruction of data and instable operation of SCSmail may be the result. These folders should only be controlled by the program itself.

3 The SCSmail user interface

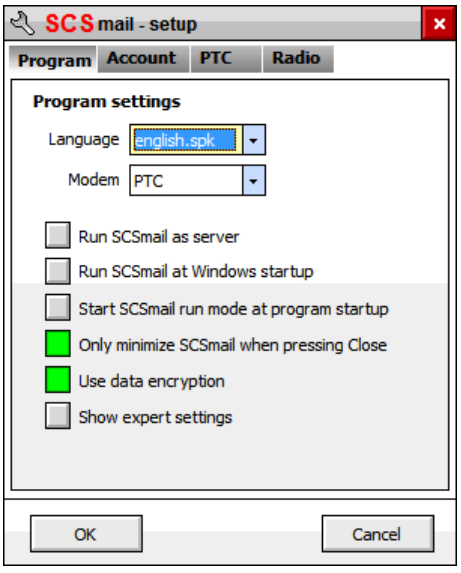
A clearly structured user interface with sections associated with their functions is evident after the first launch of SCSmail. The language is set to English by default, but can be altered to German (or other languages, if supplied). How to change language is described below.



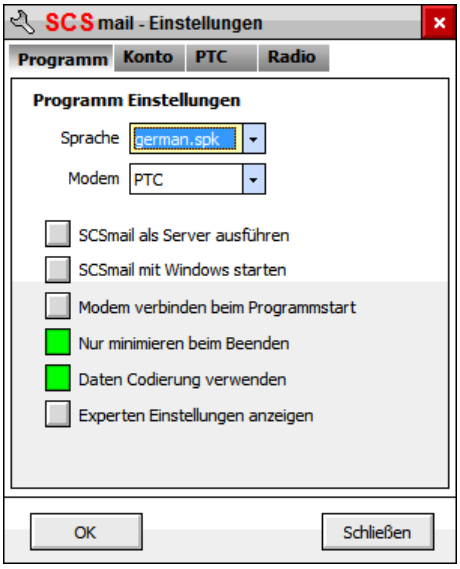
3.1 Altering the language of the user interface

Generally, to modify settings of the program, in this example the language of appearance, click on the button SETUP.

The SETUP button is only available when the program is in standby mode. It opens the following window:



The pull down menu ***"Language"*** offers several languages to be selected. If you e.g. would like to switch the program to German, you would need to select ***"german.spk"***, as shown below.



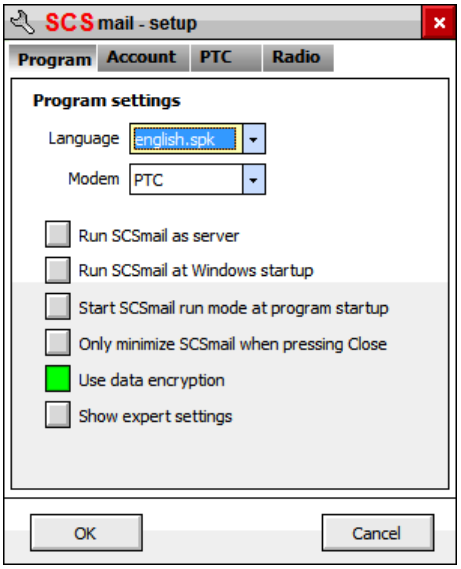
With OK the setup dialog can be terminated and the new settings are automatically stored in the file ***"settings.ini"***.

SCSmail is now configured to operate with a German user interface. Perhaps not applicable for the readers of this manual ☺.

Not all items can be translated into the respective language, because they have to be used in a unified way to a large extent for the communication with the support. This primarily concerns all items in the event log and all messages concerning the program states.

3.2 SCSmail Setup

3.2.1 Program



Language

Provides the possibility to adapt the program appearance to the desired language.

Modem

SCSmail supports all HF modems beginning with the legendary model ***PTC-II***. As there are differences in the possible modes of operation between the modems, the correct modem type needs to be selected. The possible parameters are:

PTC	for PACTOR operation
PTC PR	for PACKET operation with a PACTOR modem
TRACKER	for PACKET operation with the Tracker DSP – TNC

Run SCSmail as Server

Here must be selected, whether SCSmail shall be used in server or client mode. Dependent on that selected mode of operation, only applicable additional settings are displayed for being modified. This means e.g., that the next setup screen changes between **Server** or **Account** in accordance with this switch.

Run SCSmail at Windows startup

When this option is selected, SCSmail will start automatically with the start of Windows.

Start SCSmail run mode at program startup

This option can be activated, after SCSmail had a successful connection to a HF modem once. When activated, SCSmail immediately starts in RUN mode after program start.

Only minimize SCSmail when pressing Close

Prevents SCSmail from accidently being closed. SCSmail is a tool which regularly runs in the background. Accidently closing SCSmail will lead to unavailability of the email service. When this option is selected, SCSmail is minimized in the system tray instead of being closed completely.

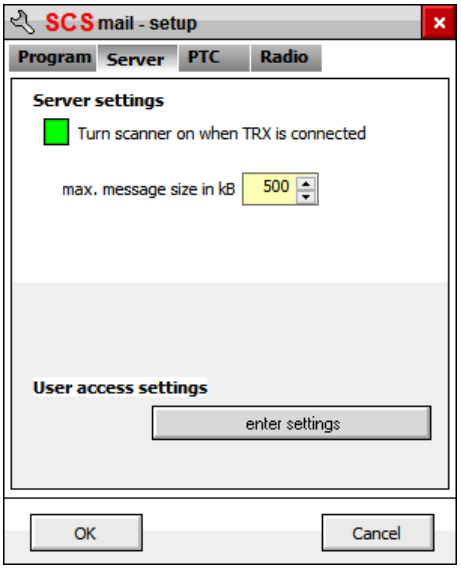
Use Data Encryption

Without this option activated, SCSmail will just transfer the account information with encryption. All other email content will be transferred over the air in plain text. When activated, all data will be transferred encrypted, using a key, which is only valid for the current connection. It is recommended to enable data encryption, if in accordance with legal regulations.

Show expert settings

For troubleshooting, additional options may be required. In case of error, the support will guide you accordingly.

3.2.2 Server (server operation)



This configuration screen is only available with SCSmail set to server operation mode (see above), as settings for server mode have to be entered here.

Turn scanner on when TRX is connected

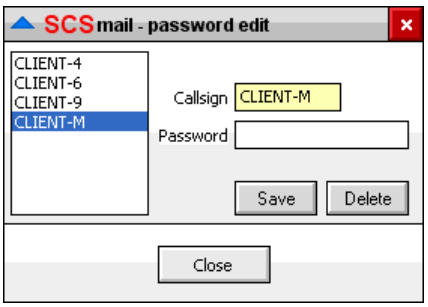
Enables the frequency scanner to start automatically, if the TRX control feature is generally enabled and properly configured (configuration page: **Radio**).

Max. message size in kB

To avoid picking very large mails from an email account via a narrow banded HF channel, the size of a message can be limited already at the server side. This setting refers to the real size of the whole email.

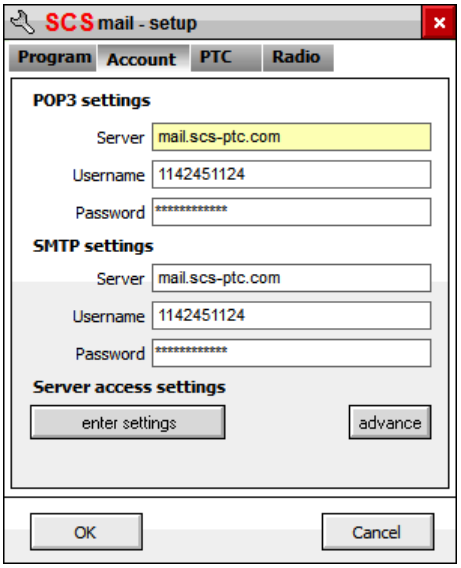
3.2.2.1 User access settings

With default settings, SCSmail would be available to any SCSmail client. It may be desirable to limit the availability to a certain group of users, this can be done with the access management system behind the button [enter settings], which will open the following configuration screen:



This example shows how an entry for ***"CLIENT-M"*** is created. If an entry shall be deleted, this can be done with the **Delete** button, after the entry has been selected. The same way, the Password can be changed, just select the entry to be changed and type in the new password and click on **Save**. **Close** terminates this configuration screen.

3.2.3 Account (Client operation)

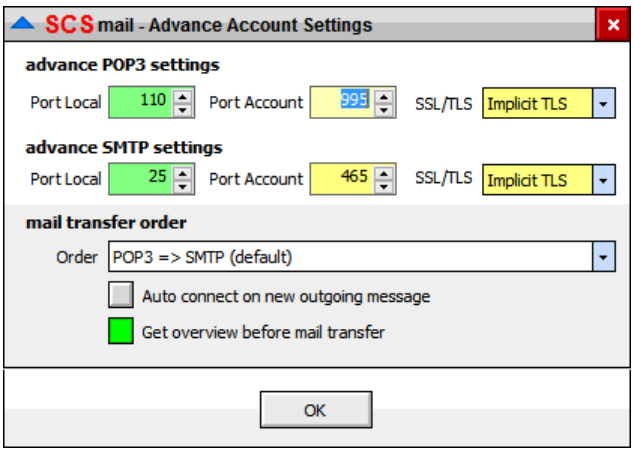


This configuration screen is only available with SCSmail set to client mode of operation.

Settings for the real email account are entered here. The parameters given, are transferred to the server and used by the server to connect to an email account e.g. via the Internet.

3.2.3.1 Advanced Account Settings

SCSmail is pre-configured to access standard email accounts with POP3/SMTP. As some accounts require different port settings, or utilization of SSL/TLS protocol, this can be configured using the advance switch. The following screen opens:



Advance POP3 Settings

The green field „***Port Local“*** identifies the port being used for the local POP3 connection between the email program and the SCSmail client. This value usually does not need to be changed at all.

The yellow field „***Port Account“*** identifies the port being used for the connection between the SCSmail Server and the email account at the service provider, over the Internet. The yellow checkbox ***„SSL/TLS“*** provides the possibility to select the protocol being used, if different from standard.

Advance SMTP Settings

The green field „***Port Local“*** identifies the port being used for the local SMTP connection between the email program and the SCSmail client. This value usually does not need to be changed at all..

The yellow field „***Port Account“*** identifies the port being used for the connection between the SCSmail Server and the email account at the service provider, over the Internet. The yellow checkbox ***„SSL/TLS“*** provides the possibility to select the protocol being used, if different from the standard.

Mail transfer order

Here the sequence of operation between SCSmail client <---> server can be defined. It may be desirable to have the POP3 connection at first and SMTP at last, or vice versa.

Auto connect on new outgoing message

If the SCSmail client is active and new messages appear from the email program, an HF connection to the last called SCSmail server station can be established automatically. This feature can be enabled here, but as it represents a fully automatic operation of the HF radio station, it shall only be used in accordance with the laws of the area of use.

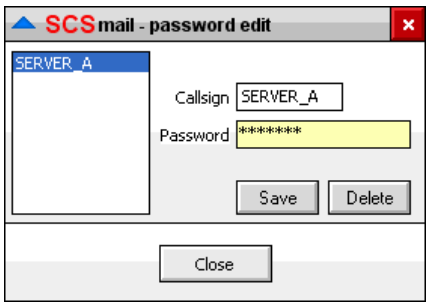
Get overview before mail transfer

With this option set, SCSmail just retrieves a list of emails available from the account server over the Internet as an overview, instead of downloading all these emails. This enables the user to preselect emails to be downloaded and transferred via HF radio and hence to avoid receiving spam, too large messages or other unwanted contents. It also enables the user to selectively delete mails from the service provider’s server.

OK closes this dialog window.

3.2.3.2 Setup for password protected server access

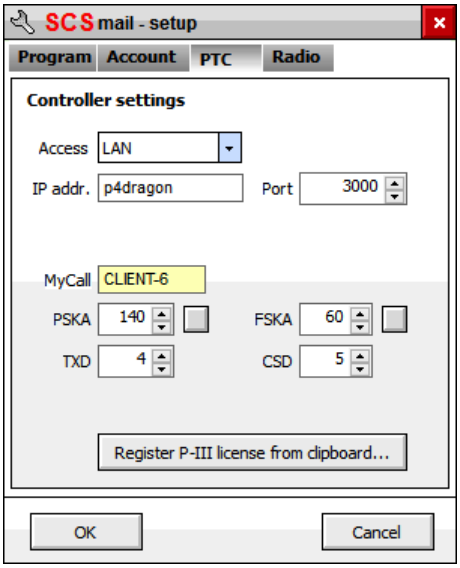
To get access to a password protected SCSmail server, it is necessary to enter the correct access codes. This codes (server names and passwords) can be managed using the enter settings button, which opens the window below.



In this example, an entry for ***"SERVER_A"*** has been created. To delete an entry, select it and press **Delete**. To change the password, select the entry and type the new password into the *Password* field and press **Save**.

Close terminates this dialog box.

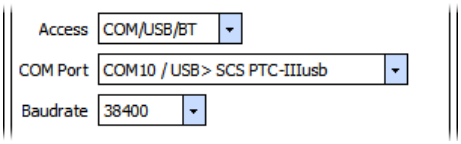
3.2.4 PTC



This dialog box is to setup the communication between the modem and SCSmail. All settings are important for proper modem operation, so care should be taken.

Access
SCS HF modems can communicate with the PC in several ways. The pull down menu provides the choice of the physical connection between LAN and COM/USB.

Is the modem connected via V24/RS232 COM-port, via USB or via Bluetooth, then the *Access* setting needs to be set to **COM/USB**.

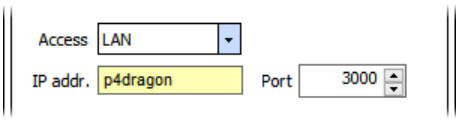


COM Port
This is the port, the modem is connected to. Is the modem connected via USB or Bluetooth, a driver needs to be installed previously. This driver creates a *virtual* COM port, which is treated the same way like a physical serial COM port. To find the correct COM port number, refer to the device manager of your Windows system (Connections → COM and LPT).

Baudrate
The baudrate selected here must be identical to the baudrate setting in the modem.

Both parameters must be set properly, otherwise the communication between the modem and the PC will not work.
If you use a P4dragon modem or a PTC-IIIusb, the setting of the baudrate does not care, as the driver handles that automatically.

To gain maximum flexibility in connecting and operating an SCS HF modem, some modems can have an Ethernet/LAN connector optionally. When this connector shall be used to access the modem, the *Access* setting has to be set to **LAN**.



IP addr.
The IP address of the modem shall be entered into this field (IPv4). As an example 192.168.100.141, if this is the assigned IP address of the modem. Alternatively, the HOSTNAME can be entered here as well.

Port
Defines the TCP/IP port, being used for communication. Usual setting is 3000.

Both parameters must be set properly, otherwise the communication between the modem and the PC will not work.
Is the HF modem connected to a router, it may be necessary to configure a port redirection within this device.

All following parameters are necessary and independent from the way of modem access.

MyCall
Defines the own callsign. It must be unique in the whole system. In the example above, it would be „CLIENT_A“.

PSKA / FSKA
Defines the modem's audio output level do modulate the transmitter. The values are given in mVp-p. If the values are already known from a different application, they can easily be taken over. If they are unknown, the proper values have to be evaluated for the present combination of modem and transceiver.

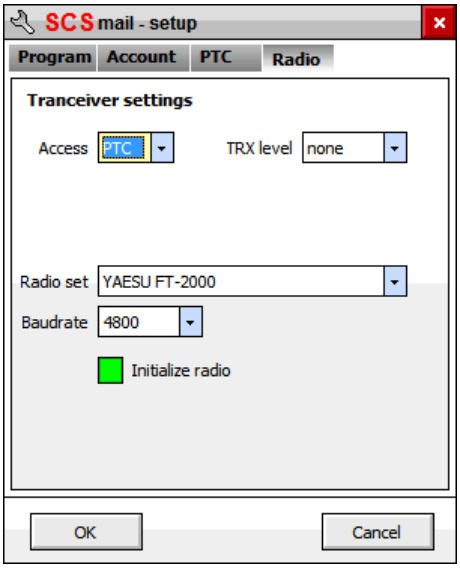
The small buttons right beside the PSKA/FSKA entry fields can be used to find the correct levels. Clicking on one of them will switch the transceiver into transmission mode and will modulate it with the associated modulation („unproto“ transmission). Now the modulation level can be adjusted with the **page up** and **page down** keys on the keyboard in 10 mV steps, or with the **up** and **down** keys in 1 mV steps

TXD / CSD
These parameters allow the adjustment of the PACTOR timing to match with the radio being used. Usually no change of the defaults is necessary, just older transceivers may need adjustments.

Register P-III license from clipboard
This option supports registering the PACTOR-III license. Before doing this, the complete key must be copied into the clipboard. Not necessary with P4dragon modems or the PTC-IIIusb.

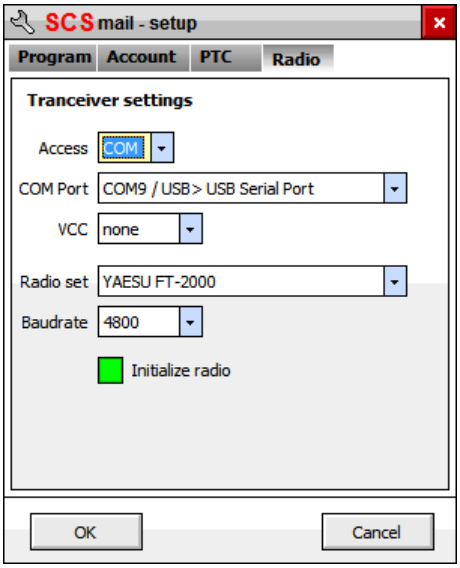
3.2.5 Radio

This menu configures the transceiver remote control parameters. The transceiver can either be connected to the control output of the modem (Access set to PTC) or to a second communication port of the PC (Access set to COM).



If the transceiver remote control port is connected via the modem, the user has the choice between 5V-TTL and V24 control levels by using the **TRX Level** selector.

If the HF modem used does not provide the possibility to control the radio at all, it is not necessary to live without that convenient way of automatically setting the radio's frequency. In this case, the radio can be connected directly to another free COM port of the PC.



COM Port
Defines the COM port of the PC, where the transceiver is connected to.

VCC
Provides the possibility to supply level converters of low power consumption to be supplied directly from the COM connector of the PC. The following options are possible:

none	no supply out of the COM port
DTR	only the DTR wire is set to H level
RTS	only the RTS wire is set to H level
BOTH	both, DTR and RTS are set to H level

All following parameters are necessary and independent from the physical connection from which the transceiver is controlled.

Radio
Every manufacturer uses its own protocol for remote controlling the transceiver. Even the same manufacturer may use different protocols for different radios of his brand. SCSmail knows the programming languages of the most common radios and provides the possibility to select them here.
In the case that the radio being used is not listed, the chance is high, that the setting of another same family radio being listed, is working as well.

Baudrate
Defines the communication baudrate between the control interface at the modem (or PC) and the transceiver. Refer to the transceivers operating manual to obtain the correct value for this setting.

CI-V adr (only for ICOM)
The communication with ICOM transceivers is bus orientated. Every ICOM radio has an individual address. This address needs to be entered here. The value has to be given hexadecimal.

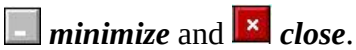
3.3 Features of the main window

Here the graphic user interface of SCSmail will be described top down and in detail.

3.3.1 Headline

In the headline, upper left, the program symbol, name and version number are shown.

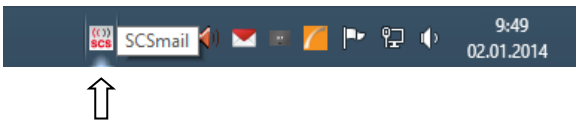
At the right side, the usual buttons

 ***minimize*** and ***close***.

are visible.

With standard settings, clicking on ***close*** results identically to clicking on ***minimize***. This is made to avoid accidentally closing the program. This behavior can be individually programmed, as described in the section *setup*.

When minimized, the SCSmail symbol appears in the Systray – bar, left to the clock.



A double click on the symbol restores the main window of the program. The program can be terminated with a right mouse button click on the symbol and selecting ***close***.

At termination, all setting of the program will be saved, to be restored at next start.

3.3.2 Access- and status area

3.3.2.1 In General

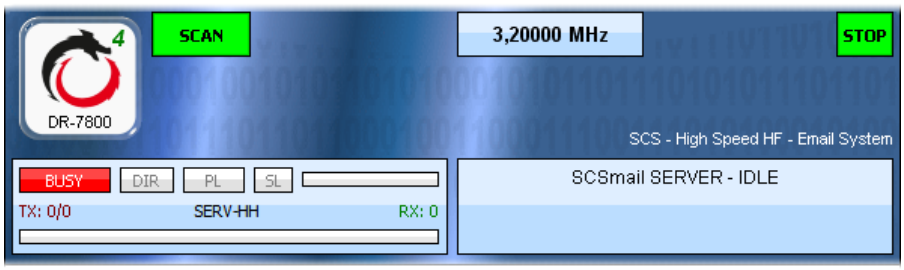
In *Standby* condition (not operating, but ready for configuration), all status fields are grayed out.

The SETUP button enables the program setup menus. Refer to last chapter above for detailed descriptions of the setup screens.

RUN sets SCSmail into the operating mode. Before using this button, the setup as described above should have been completed.

As soon as SCSmail has changed its mode of operation, the appearance on the screen is adapted accordingly. With this, there are different screens for client and server use, which differ in color and selectable options in the status and access area of the program screen.

3.3.2.2 Server - operation



In server mode and in active operating condition, the status fields are of light blue background color. On the left side is the modem status area, it shows the most important information about the HF modem being connected. In this example a Dragon HF modem DR-7800 is in use. The maximum usable PACTOR level in this configuration is 4.

Right beside the modem symbol is the SCAN switch. If frequencies have been defined and scanning is enabled, these frequencies will be checked in a consecutive way.

The blue frequency field displays the frequency that was last switched to.

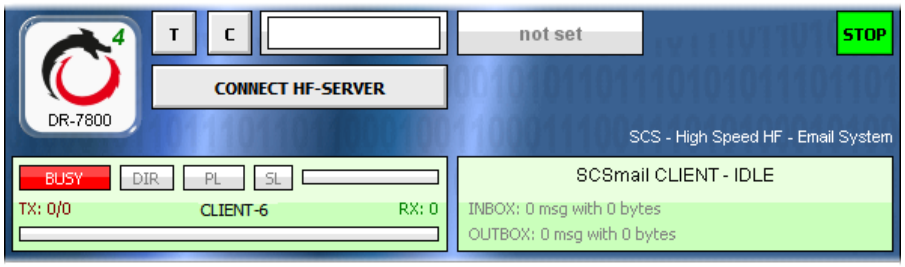
Below the modem symbol, the most important modem operating conditions are shown graphically:

BUSY / STBY	Indicates if a frequency is detected as occupied or free. Before connecting to a distant station, the BUSY indicator should be verified to be inactive; otherwise there could be collisions with other stations already using this channel.
DIR / IRS / ISS	Indicates the transmission or reception conditions.
PL / 1-4	Indicates the PACTOR level currently used.
SL / 1-10	Indicates the Speed Level currently used, possible values 1-6 for PACTOR 3 or 1-10 for PACTOR 4.

The small progress bar right besides the SL indicator shows the amount of data being left for transmission inside the modem's transmit buffer.

The right side shows the actual operating condition of SCSmail. The example screen above shows SCSmail in idle state, scanning over the frequencies as being programmed. In this condition, the SCSmail server is ready to accept incoming connects from possible clients.

3.3.2.3 Client - operation



In client operation the status fields are of light green background color.

The status display of the modem area does not differ between server and client mode, meanings are just the same.

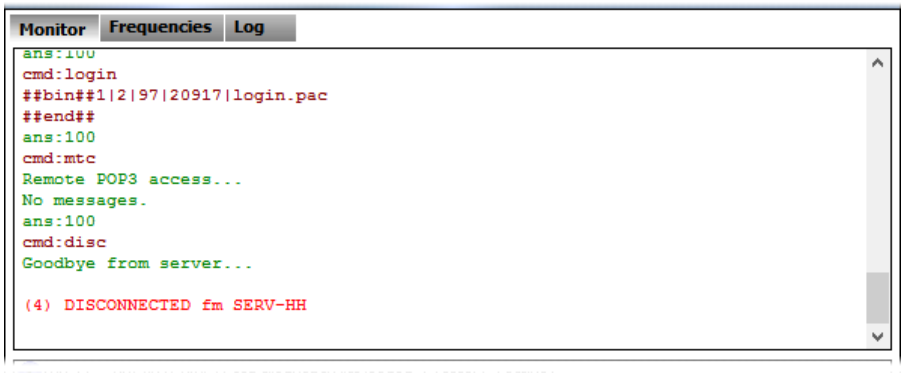
In client mode, left to the white call sign field, there are additional buttons available:

T	Provides the possibility of a test connection with the server station, without any data exchange. The purpose is just to verify the access to the distant email account.
C	Initializes a keyboard chat with a possibly available human operator at the server side at the next connect. If there is no operator present in person, then the connection is terminated after 30 seconds automatically.
CONNECT HF – SERVER	Establishes a connection to a SCSmail server.

Also here, on the right side, the actual operating condition is displayed. The example above shows the SCSmail client in idle mode, providing the possibility to exchange emails with the locally installed email client program. If there are mails in the virtual mailbox of SCSmail, the indicators **INBOX** and **OUTBOX** will show their quantity.

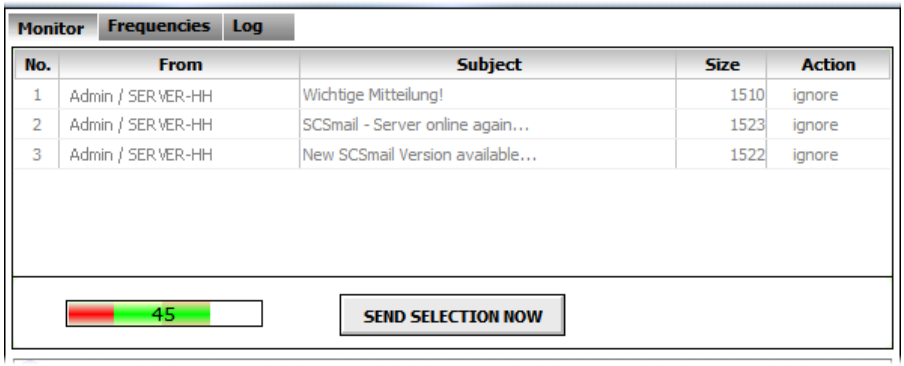
3.3.3 The Monitor

3.3.3.1 Normal Client / Server operation



Within normal operation, all information about the progress of a HF connection is displayed here. Transmitted data is shown in dark red, received data is shown in green color. Status messages are displayed in light red color.

3.3.3.2 Selecting messages



By default, SCSmail is configured in a way, that all messages are picked and transferred in the order of their appearance. If the client side is configured to just obtain a list of messages being available, then this list represents just an overview of the mails available, before they are transferred over the air.

This feature is very useful to avoid server access time and airtime to be wasted for spam or actually unwanted emails. It also can be used to avoid transferring too large messages.

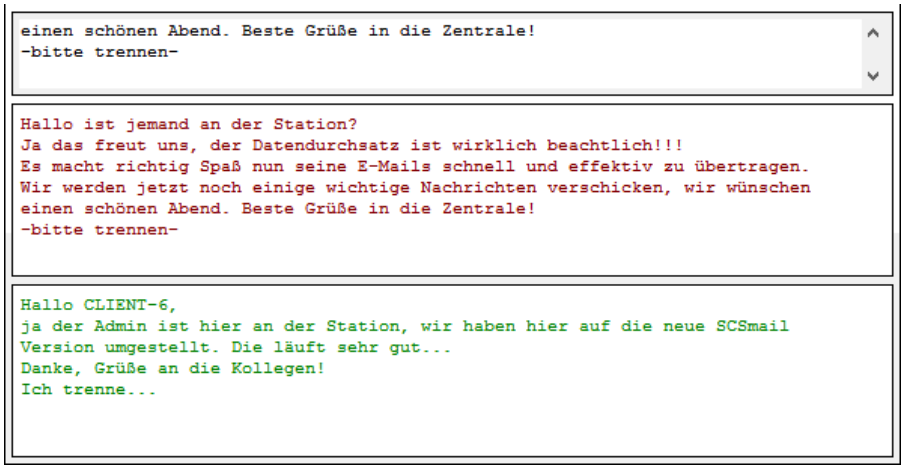
The example above shows three messages contained by the postbox, which could be picked by SCSmail.

The operator at the client side has the possibility to assign a treatment attribute to every message. If this does not happen within a certain time, the HF connection will be terminated automatically.

There are three treatment attributes possible for every message, which are assigned by multiple double clicking on the message entry.

ignore	The message is **not** transferred and **not** deleted, but simply ignored.
read	The message will be transferred via HF and in case of success, deleted at the server side.
delete	The message will be deleted without being transferred (e. g. if spam).

3.3.3.3 Chat operation



If the **T** button has been activated prior to a connection to the server, SCSmail will establish the connection in chat mode. The chat window appears divided into three sections. From top to bottom, these sections are:

- the data entry area
- the transmission area and
- the data reception area

If no operator is available for chat at the server side, the connection will be terminated automatically after an appropriate timeout.

3.3.4 Generating a list of operating frequencies

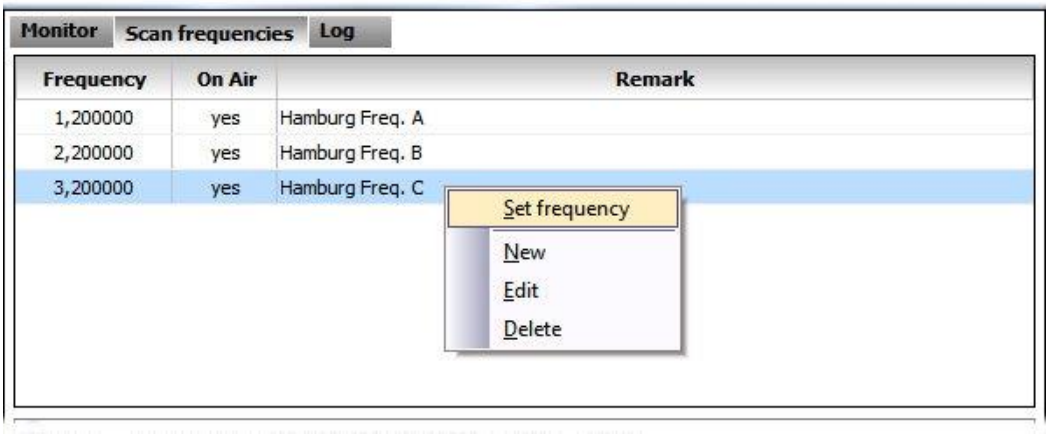
3.3.4.1 Generally

To assure that the used transceiver actually scans the frequencies entered in the list, it is necessary to do a proper setup of the transceiver control feature before. Also refer to the manual of the transceiver to obtain values for correct settings.

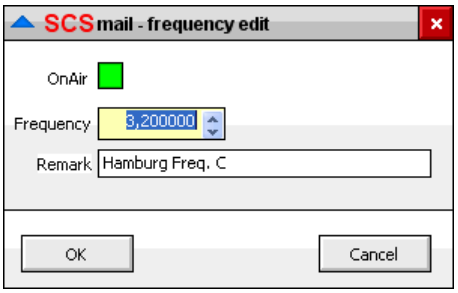
All frequencies displayed herein are to be treated as examples!

3.3.4.2 Server – operation

In server operation, the frequency entries can be added with a small comment text. For manually testing the transceiver control feature or the availability of a free frequency, this can be done with a right mouse button click over the frequency entry. A menu "***Set frequency***" pops up, which allows to send the selected frequency to the transceiver, or to manage the entry being selected.



If an entry shall be added or edited, another option window will pop up:

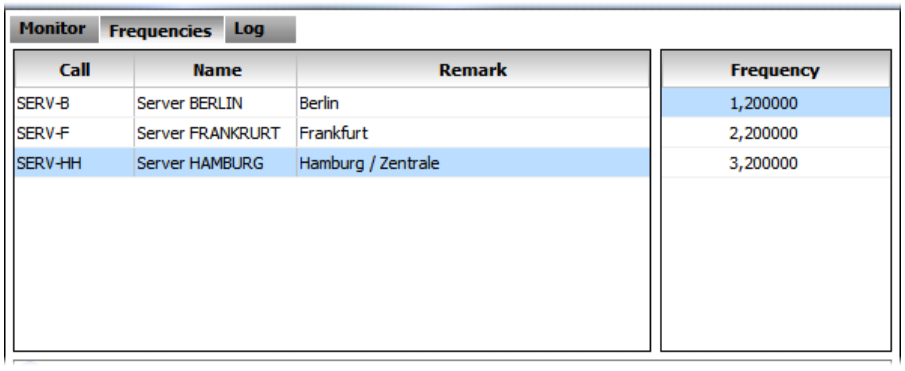


The **On Air** switch defines, whether the selected frequency entry is used for **SCAN** operation or skipped. The entry remains in the list, also when disabled for the current scan operation. It can be enabled later again, if required.

The field **Frequency** contains the frequency in MHz. If a frequency is entered in kHz, it will be converted into MHz automatically when the menu is closed.

Remark is used as a comment field and can be filled by the user with some explaining text, associated with the frequency entry.

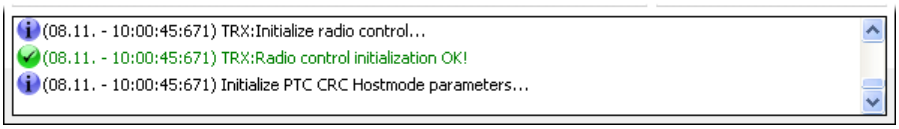
3.3.4.3 Client – operation



To operate a good and stable HF network, it is desirable to have more than one SCSmail server on different locations, probably also operating on different frequencies. To support that in client operation, several frequencies and several servers can be listed.

Also here, the right mouse button opens the known menu to manage the entries of this list.

3.3.5 The Event log



The lower area of the main window represents the event log. Its purpose is to view and verify all actions SCSmail does, mainly for the purpose of trouble shooting and skilled operator's information. The entries shown here can be grouped into four categories:

Blue **i**	Information about normal program activity.
Green **check mark**	Information about a successful program activity.
Red **X**	Reference to an erroneous program activity
Yellow **!**	Reference to a limitation in a program activity

The content of this window will also be stored in the file ***"Program.log"*** at the folder ***"log"*** within the SCSmail program folder.

If SCSmail does not behave as expected, the event log should be used as a help for trouble shooting. This should quickly lead to a result on what might have gone wrong, e. g. the transceiver control or the communication to the modem.

4 Example configurations

To exchange emails using SCSmail, an email account in the Internet is required. There are free providers like GMX, GMAIL or WEB.DE. Generally it should work with all of them, as the communication protocols are standardized. An account which utilizes secure SSL/TLS communication is recommended!

Basically, the local communication between SCSmail and the email client program runs via the Pop3 as well as SMTP protocol. As server "LOCALHOST" is being used.

The basic parameters for incoming mails (POP3) are:

- Server, always LOCALHOST
- Username, always the same as the email account itself
- Password, always the same as the email account itself
- Port 110 / no secure connection (no SSL/TLS)
- Optionally activate „Delete emails after dowrnload"!

The basic parameters for outgoing mails (SMTP) are:

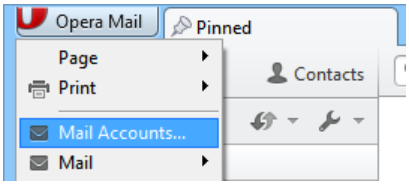
- Server, always LOCALHOST
- Username, always the same as the email account itself
- Password, always the same as the email account itself
- Port 25 / no secure connection (no SSL/TLS)

The following examples will explain how the email client and SCSmail are to be configured for flawlessly operation.

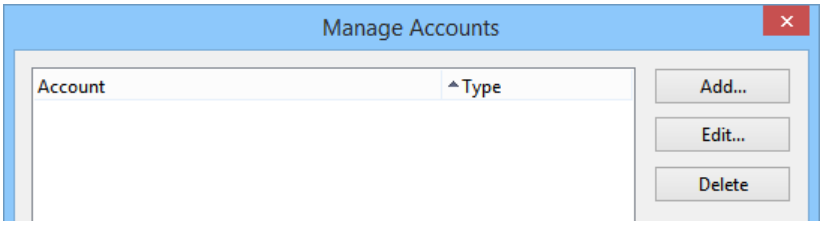
4.1 Opera Mail (Version 1.0)

This example assumes an email account at the provider GMAIL, which communicates in the Internet via SSL/TLS only.

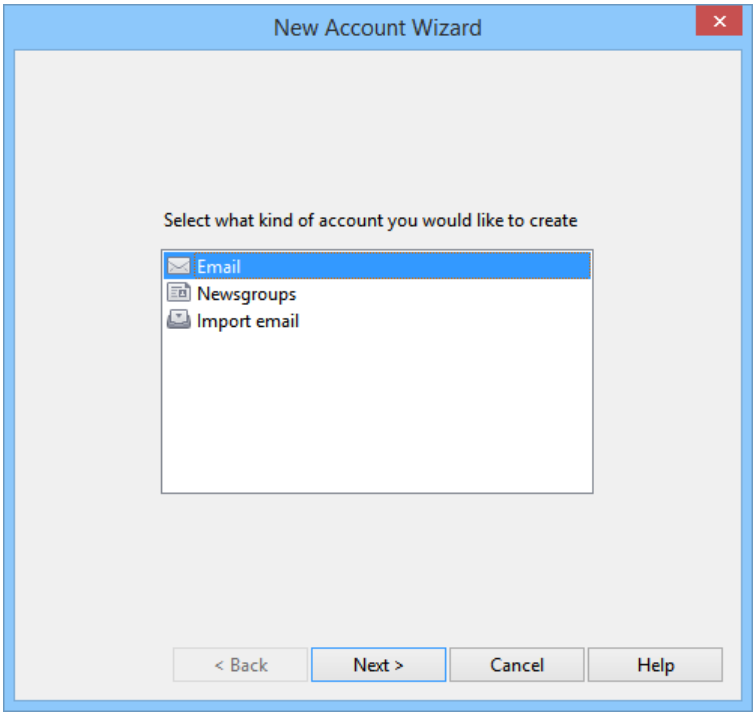
At first, a new email account will be created. For that, open the Opera Mail menu right above and click on the item “Mail Accounts…“.



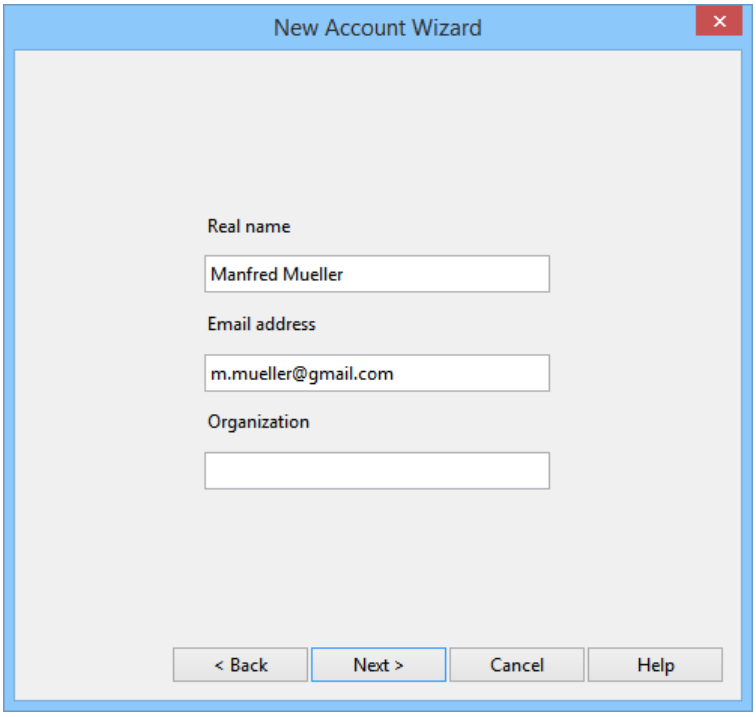
An overview over all email account appears next…



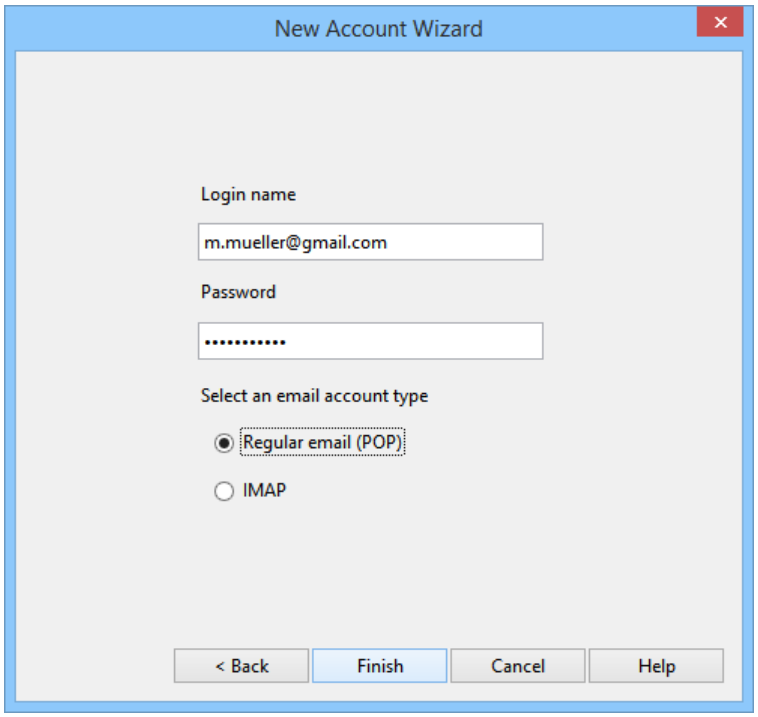
…now click on “Add“.



Select “Email“ and click on “next“…

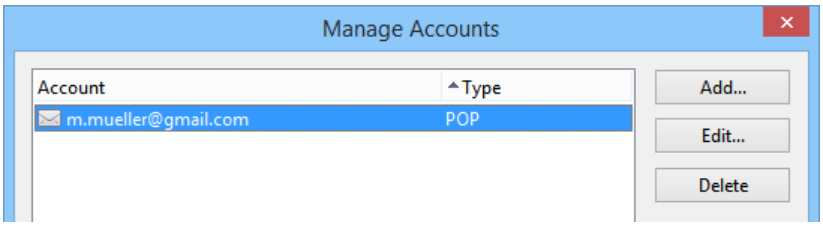


Fill in the fields “Real name“ and “Email address“ and then click on “next“…



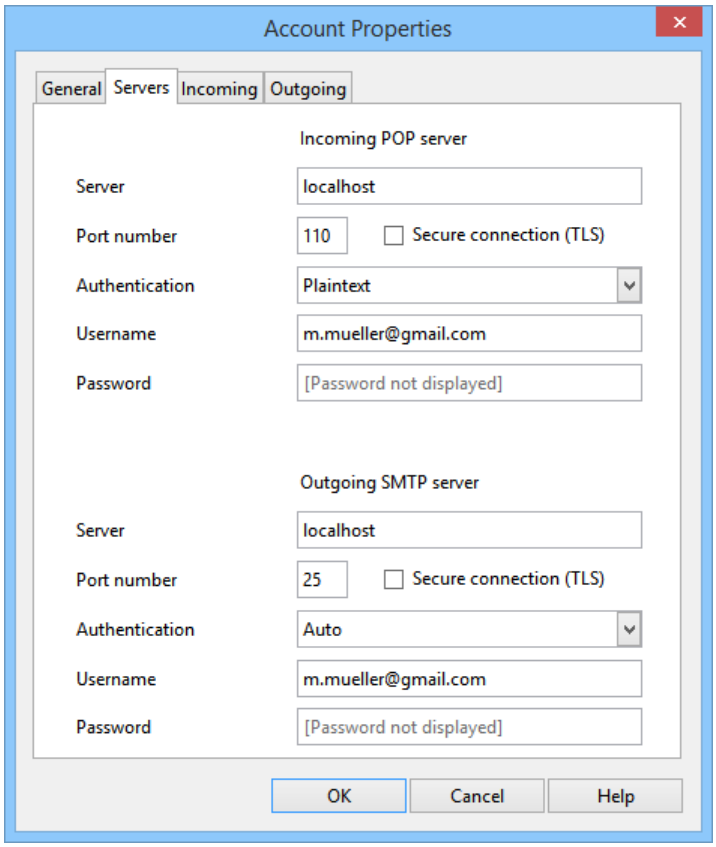
Now enter the correct password for the GMAIL account, this will also be used for the local communication between the email client and SCSmail. Click “Finish“ afterwards...

The new created account appears in the overview now.



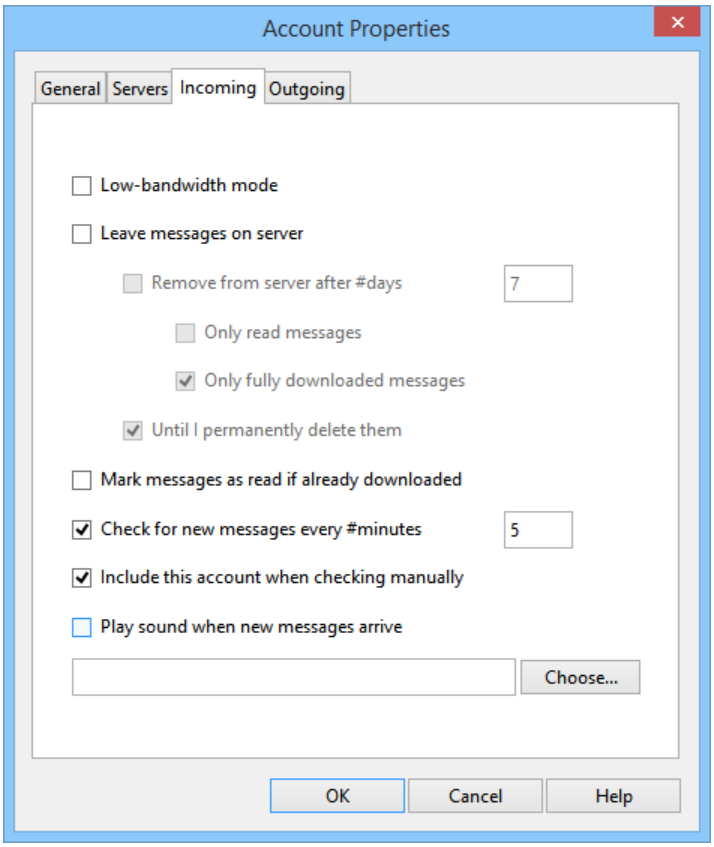
…for additional settings, now select the new account and click on “Edit…“.

On the configuration mask “Server“, the following modifications need to be done for the local communication with SCSmail.



Now, click on “Incoming“.

Do the modifications on “Incoming“, as shown below.

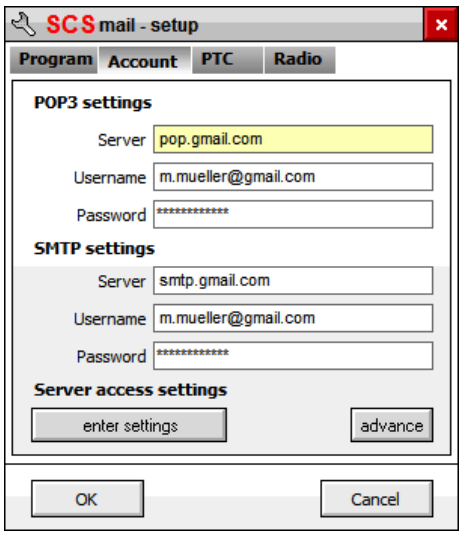


With this, Opera Mail is ready for the communication via SCSmail.
The next chapter shows how SCSmail is to be configured to do the job with GMAIL

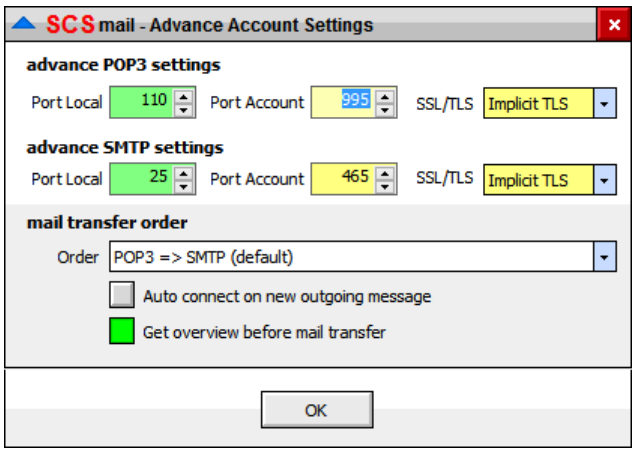
4.2 Creating a GMAIL account in SCSmail

The SCSmail setup needs the real world user access data for the GMAIL email account over the Internet. This is the purpose of the settings done here.

At first, open "Account" in the SCSmail setup…



Here the user access data for the email account is entered. As a GMAIL account requires a communication via SSL/TLS, there are additional settings necessary. For that, click on "advance".



With this, the email account configuration in SCSmail is done.