Waternet Operating Manual

Version 1.0.9.224 and higher

Contents

List of Illustrations

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1 Preamble

1.1 Overview

The Waternet program is used to configure the FAST GSM network (herein referred to as "*network*"), which allows independent acquisition of measurement data transmitted by the radio loggers. Such data can then be forwarded to a server. Illustration 1-1 below shows a simplified network structure including the relevant components. Data flow is marked red and illustrates network operation, with the data being forwarded from Repeater Box (RB) to Repeater Box and finally being stored on a server. Data transfer among the devices during network set-up follows the blue arrows as shown below.
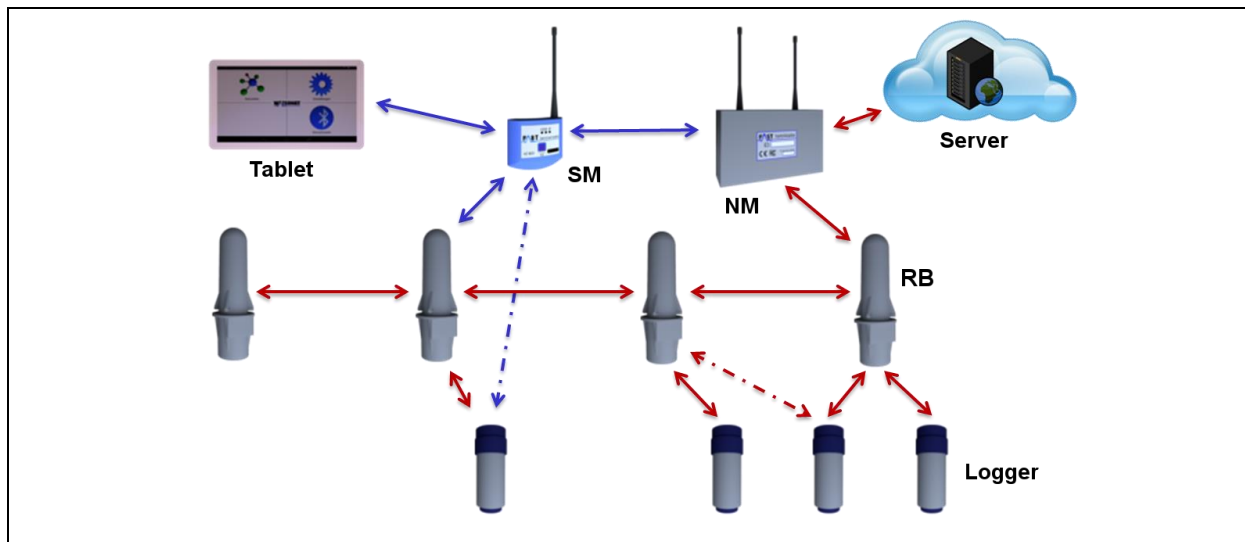
Illustration 1-1: Network schematic

Network operation (Illustration 1-1, red data flow) comprises four devices. The radio loggers acquiring the measurement data constitute the lowest level. One level higher, the so-called Repeater Boxes (in Illustration 1-1 shown as RB) are positioned. These Repeater Boxes receive and store the measurement data transmitted by the single radio loggers. As soon as the data from the radio loggers is available in the Repeater Boxes, the data is interchanged among the Repeater Boxes at a fixed point of time. The measurement data is not distributed on a random basis but follows a defined structure. All measurement data received from the radio loggers finally reach the Networkmaster (in Illustration 1-1 indicated as NM), which virtually constitutes the brain of the network. The Networkmaster (NM) is the only device to be equipped with a GSM modem allowing the NM to transmit the collected data to a web server via the cellular radio system.

Two addional devices are required for the network set-up process (Illustration 1-1, blue data flow): a tablet and a Servicemaster (in Illustration 1-1 indicated as SM). The tablet is used to control a so-called Servicemaster, which then will process the orders issued by the Waternet program and forward the data to the Networkmaster, to the Repeater Boxes, and to the radio loggers. The data is exchanged between the tablet and the Servicemaster via Bluetooth connection. Data exchange between the Servicemaster and the network devices is conducted via a 433Mhz band radio connection. Both devices, the tablet and the Servicemaster, are only required for network set-up. Once the network has been set up, subsequent network operation is virtually autonomous.

1.2 Tablet specifications

The tablet, which is to host the Waternet program, needs to meet certain software and hardware requirements for installation via the Play Store. The required software specification is related to the tablet operating system, which needs to be any android version between 4.4 and 7.12 to run the current Waternet version (1.0.8.100). Concerning hardware, the following components are required for programme installation on the tablet:

- Bluetooth receiver

- WiFi or 3G / 4G network (optional)

- Rear or front camera (optional)

- GPS receiver (optional)

- Internal free memory capacity

1.3 Installing the Waternet program

Please note that you need to install a free Play Store account before you are able to download the Waternet program to your android tablet. If you already have a Play Store account, please activate the account on your tablet for the download of the Waternet program from the Play Store. If you do not have a Play Store account yet, please install a new Google account. The account can be created on a PC either through the following link or directly on the tablet.

Creating a Google account on the PC

Please proceed as described below if you wish to install the account on your tablet directly:

1. Call the "Settings" program on your tablet.

2. Select "Accounts & Synchronization" and then "Add account" at the lower edge of the screen.

3. Please select "Google" as the type of account. You will now be asked if you intend to add an already existing account or if you wish to create a new account. Click on "New".

4. Now you need to enter your first name and your surname into the corresponding boxes, then click on "Continue".

5. The next step is to enter the requested e-mail address. Please note that you can only choose the part before the "@" symbol. This newly created e-mail address will be your log-in e-mail address for the Play Store from now on. Once you have finalized your e-mail address, click on "Continue".

6. Now please select a password for your new account. This password needs to consist of at least eight characters. The system will request you to enter your password again in the second box for verification purposes.

7. Now enter an already existing e-mail address (e.g. with GMX, Yahoo, or WEB.DE) you have access to. Please also select a security question and enter the appropriate answer in the corresponding box.

8. The system will now ask you if you also wish to register with Google+. Please note that it is not required to register with Google+ to operate the Waternet app. So if you do not wish to register with Google+, click on "Not now".
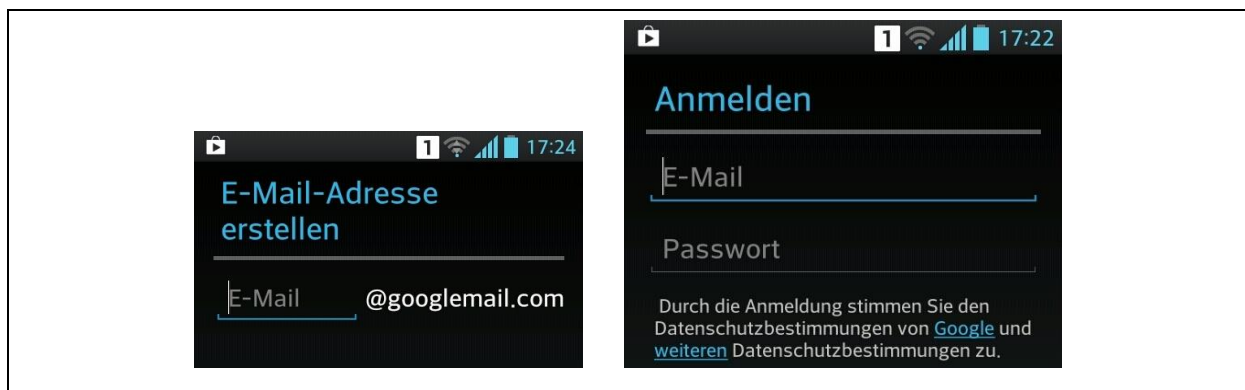

Illustration 1-2: Play Store account

As a final step, you can now activate the web protocol for your account. This web protocol function assimilates search results on the basis of your search requests and of the visited websites. If you do not wish to activate this function, please remove the corresponding tick. Click on "I agree" to accept the Google terms of use and the Google data privacy policy.

As soon as the account has been activated on your tablet, you can start the Play Store programme on your tablet. The corresponding icon of this programme looks like a little shopping bag. The Play Store search function is activated by tapping on the magnifying lens, which is usually located in the upper right corner. Enter "Waternet" and tap again on the lens. After a while the system should display our programme as the search result. Now tap on the image of our programme in order to be directed to the Description section, where you will have to tap on the "Install" button to install the programme on your tablet. Once the programme has been installed, close the Play Store programme. The Waternet programme can now be started and is ready for operation.

1.4 Servicemaster

The Waternet program can process the data received from the network devices as soon as the Servicemaster device has been connected with the tablet via Bluetooth. So the Servicemaster receives the radio signals issued by the network devices at one end, and at the other end it forwards this information to the Waternet program via Bluetooth and vice versa respectively.

1.4.1 Visual device status indication and user interface

The Servicemaster has three status indicating LEDs to visualize its operating status. Two of these LEDs indicate the charge state of the Servicemaster battery and are located directly beneath the battery symbol (see Illustration 1-3). As soon as the Servicemaster has been switched on, these two LEDs should be constantly lit in red. If the battery is running out of power, the LEDs will start flashing to indicate that the Servicemaster needs to be recharged (see Chapter 1.4.2). The third LED is located under the Bluetooth symbol, which is the symbol to the right of the battery symbol, and indicates the status of the Bluetooth connection between the Servicemaster and the tablet. If the Servicemaster has not yet been interconnected with the tablet after the Servicemaster was switched on, this third LED flashes red every second. As soon as the connection between the two devices has been established (see Chapter 2.1.1), this third LED is illuminated in blue and data exchange can commence.
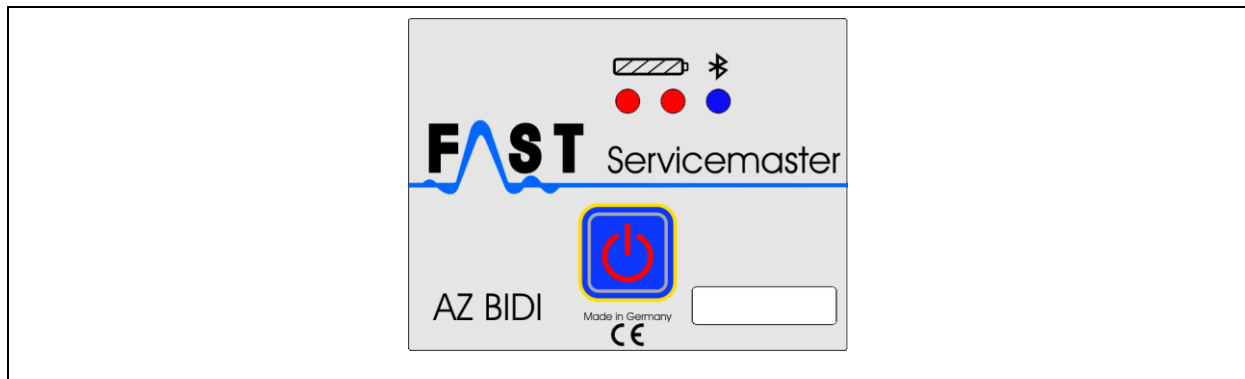
Illustration 1-3: Servicemaster user interface

It may occasionally happen that the connection between the Servicemaster and the tablet is cut without any operator's input. This is indicated through the Bluetooth LED, which in such case starts flashing in red. Data exchange between the two devices is interrupted now and a new connection needs to be established before the exchange of data can be continued. One reason for such an unintended interruption of the connection may be an excessive distance between the Servicemaster and the tablet. The longest possible distance between the Servicemaster and the tablet is usually around 5 meters. Please note that an excessive distance may cause data exchange failure.

The On/Off switch for the Servicemaster device is located in the center of the user interface. Pressing this switch for approximately one second activates the Servicemaster. Once the Servicemaster has been switched on, the LEDs are illuminated. Pressing the switch again for approximately one second deactivates the Servicemaster, and the LEDs go out.

1.4.2 Charging the battery

The Servicemaster device is equipped with a battery which allow approximately 7 to 8 hours of operation before it needs to be recharged. As soon as the battery is running low, the battery LEDs start flashing once every second. This indicates that the Servicemaster needs to be connected to the charger with the enclosed USB cable as soon as possible. When the charging cable has been plugged in on the upper side of the Servicemaster, the battery LEDs are illuminated in orange indicating that the battery is being recharged. The battery can be charged when the Servicemaster is switched off and also while operating the Servicemaster. When the recharging process has been completed, the battery LEDs are illuminated in green and the charging cable can be unplugged and removed. Please note that the Servicemaster can be operated without any limitation while being recharged.

1.4.3 Initializing Bluetooth

The Bluetooth module integrated in the Servicemaster device needs a so-called standard configuration for the communication with the tablet. This standard configuration is set during device production at the F.A.S.T. facility. If, however, this standard configuration has got lost and the Servicemaster does not establish any connection with the tablet, the Bluetooth module can be configured again in the Servicemaster. For such re-configuration, the Servicemaster requires firmware version 2.4 or higher (see Chapter 3.3). Please swith off the Servicemaster device completely before you start on the configuration set-up process. All status LEDs on the Servicemaster have to be off. Now press the ON/OFF button of the Servicemaster and keep it pressed until the accummulator LEDs start flashing alternately. Now release the button to allow Servicemaster Bluetooth module configuration. The configuration has been completed as soon as the accummulator LEDs are lit permanently and the Bluetooth LED flashes every second. The tablet and the Servicemaster can now be interconnected again.

1.5 Networkmaster

The Netzwerkmaster device is the central unit of the network and the link to the Watercloud. It not only stores all measurement data collected from the single Repeater Boxes, it also stores the settings of the single interconnected network devices. The Networkmaster needs to be set to communication mode to be capable of saving all tablet configuration data (Illustration 1-1, blue data flow), as the communication mode allows data exchange between the tablet and the Networkmaster. The communication mode is activated by placing the magnet at the bottom of the Networkmaster housing. The magnet will then active the magnet switch located inside the Networkmaster. For the exact position of the magnet swith, please refer to Illustration 1-4 (position marked with a red circle).

Once the device has been set to communication mode as described in Chapter 4.11, data can be synchronized between the Networkmaster and the tablet. If there is data transfer malfunction, such malfunction usually occurs as the Networkmaster is not set to communcation mode. In such a case, just repeat the setting process at the bottom of the Networkmaster housing and restart the data exchange process.

Illustration 1-4: Networkmaster

If the mode of the Networkmaster is not clear, the housing can also be opened by loosening the four screws at the corners of the housing. Remove the cover to find the status LEDs on the left-hand side inside the Networkmaster. The orange LED No. 2 indicates the mode the Networkmaster is currently set to. So if this LED is on, the Networkmaster is set to communication mode and is capable of communicating with the tablet. If the LED is off, there is no communication between the device and the tablet. Attach the maget to the bottom of the housing for a second if you wish to switch from one mode to the other.

1.5.1 SIM card

The Networkmaster uses the cellular radio GSM, GPRS, EDGE, and UMTS system standards to transfer data to the Watercloud server. This data transfer requires a mini SIM card to be activated via the internet. This SIM card is installed in the device by pushing the silver stop lever back, lifting the SIM card holder, and inserting the SIM card into the holder. Finally, the SIM card holder is lowered again, and the stop lever is pushed to the holder securing position.

1.5.2 Changing the accummulators

Power supply for the Networkmaster is provided with four accummulators, type 18650, connected in series. When these accummulators are no longer capable of providing the device with power, they need to be replaced. In order to replace the accummulators, please unscrew the four bolts at the corners of the Networkmaster housing and remove the cover from the housing. The accummulators can now be removed, and new, fully charged accummulators can be inserted. The Networkmaster is not equipped with an internal charger which would allow charging the accummulators. So the accummulators need to be charged externally with an additional charging unit.

1.5.3 Forced data transmission

The Networkmaster system offers the option to force the device manually with the magnet to transmit its device ID and the network ID to the Servicemaster. If you wish to force data transmission, please place the magnet at the position at the bottom of the housing (see Illustration 1-4) and leave it there. After about 5 seconds, the status LED at the inside of the Networkmaster will start flashing, and the device will send its data to the Servicemaster with every flash until the magnet is removed from the housing.

1.6 Repeater Box

The Repeater Box is the data collector of the network. It receives the data transmitted by the radio loggers and transmits such data to a neighboring Repeater Box at a fixed point of time until the entire data is received by the Networkmaster. The Repeater Box also needs to be programmed during network configuration (Illustration 1-1, blue data flow) to be fully operational in combination with the network.

Like the Networkmaster, the Repeater Box is programmed throug the Waternet program while the Waternet program is set to communication mode. The Repeater Box is switched to communication mode by attaching the magnet to the housing at the position of the magnet switch located inside the Repeater Box. Illustration 1-5 indicates this position with a blue spot. Turning the notch of the Repeater Box (Illustration 1-5, marked red) to you, the position of the magnet switch is on the right side of the housing right behind the locking notch above the housing notch (marked red in Illustration 1-5).
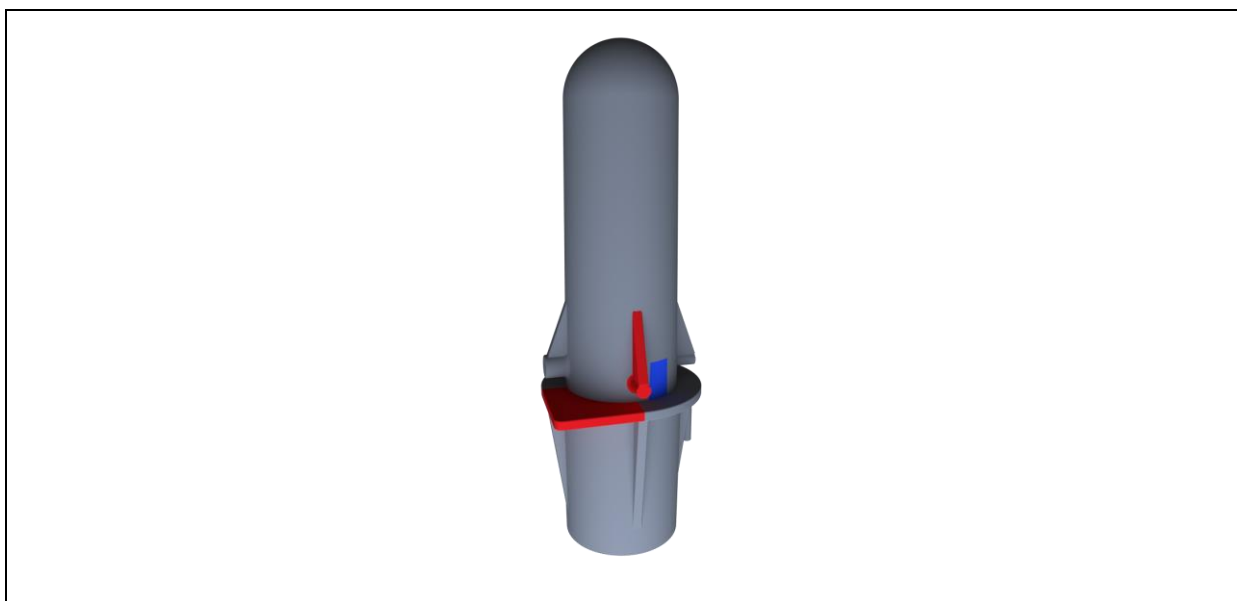

Illustration 1-5: Repeater Box

When the device is set to communication mode, data can be transferred between the Repeater Box and the tablet as described in Chapter 4.11. If the data transfer between Repeater Box and tablet is subject to a malfunction, the error is usually caused by the Repeater Box as it has not been set to communication mode. In such a case, please repeat the switching process at the bottom of the housing and start data synchronization again.

1.6.1 Changing the battery

Power is supplied to the Repeater Box with a 3.6 volt Mono D battery. The battery can be changed by removing the battery cover at the bottom of the housing (turn it anti-clockwise). As soon as the cover has been removed, the battery will drop out and can be replaced with a new battery (positive pole pointing into the housing). Please do not forget to fix the battery cover by turning it clockwise into the housing.

1.6.2 Forced data transmission

The system offers the option of manually forcing the Repeater Box with the magnet to transfer its device ID and the network ID to the Servicemaster. If you wish to force data transmission, please place the magnet at the position at the bottom of the housing (see Illustration 1-5) and leave it there. After about 5 seconds, the Repeater Box will send its data to the Servicemaster once a second until the magnet is removed from the housing.

1.7 Radio logger

Another component of the network system is the radio logger itself. The logger cap of the radio logger hosts the status LED and a solenoid switch. This switch is located under the circular icon beneath the serial number. Here the magnet has to be moved to initiate a switch in mode. The radio logger can be switched to communication mode or to measurement data transmission mode through the solenoid switch. Positioning the magnet at the solenoid switch permanently results in enforced measurement data transmission.

1.7.1 Operation modes

As already stated before, the radio logger has two different modes of operation (see Illustration 1-6), namely the data transmission mode (sending mode) and the communication mode. The standard mode of the radio logger is the data transmission mode. If the radio logger has been set to communication mode, it will automatically be reset to its sending mode after approximately 5 minutes unless there is any data exchange with the tablet. With the

radio logger being set to data transmission mode, it transmits only the saved noise level values subject to the set data transmission times. If no particular transmission times have been set, the radio logger turns to idle and sends no data.
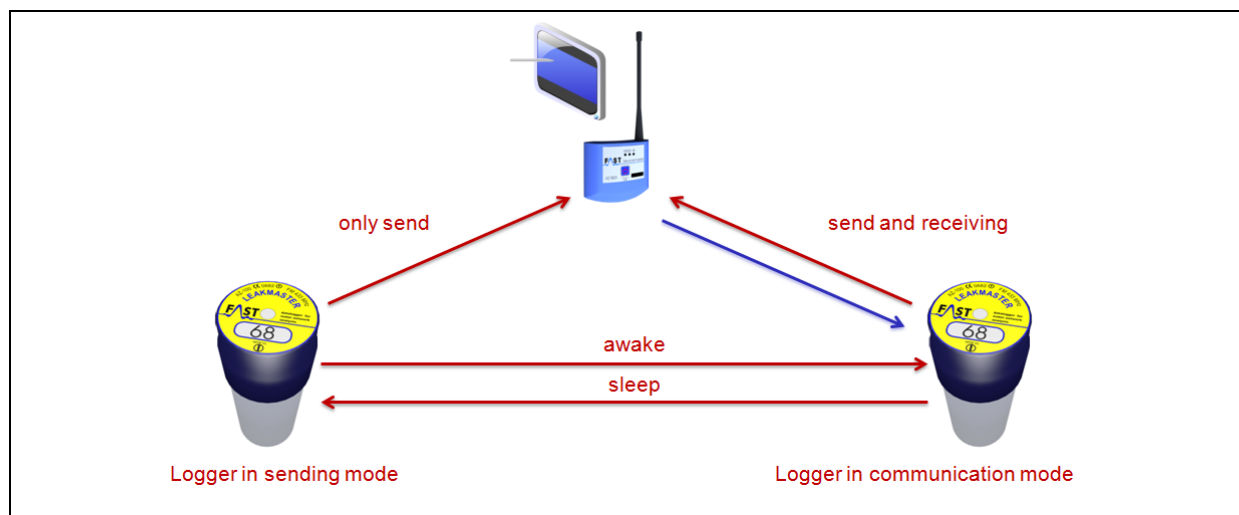

Illustration 1-6: Operation modes

Please note that the radio logger must be set to communication mode to allow the Waternet program to send any data to the radio logger through the Servicemaster or to receive any data from the radio logger. There are two options to set the radio logger to communication mode: either manually with the magnet or automatically through the Waternet program.

If you wish to activate the radio logger manually, move the magnet along the logger cap and thus above the integrated solenoid switch. The corresponding position of the solenoid switch is indicated on the cap label. As soon as the solenoid switch inside the radio logger has been activated, the radio logger starts flashing according to its particular mode. Three flashes means that the radio logger has been activated and is now ready for communication with the Waternet program. A single flash indicates that the radio logger has been switched off. It no longer interacts with the Waternet program.

If the radio logger is to change to communication mode automatically, certain data transmission times need to be set beforehand, the operation mode needs to be set to „Wake-up", and the radio module of the logger needs to be activated. Please note that the radio logger can only be contacted during the set data transmission times, i.e. if the data transmission time has been set to 8am – 4pm as an example, the radio logger can switch to communication mode automatically in this period and thus interact with the Waternet program. Any interaction of the radio logger with the Waternet program outside this time window requires prior manual switching to communication mode with the magnet.

Setting the requested operation modes requires the [AZA-OAD program](#), which is also available at Google Play Store. For a description of the AZA-OAD program, please refer to our [F.A.S.T. GmbH homepage](#).

1.7.2 Forced data transmission

If the radio module has been deactivated, it does not send any information to the Servicemaster and to the Waternet program. The same applies to any point of time outside the set data transmission time window. However, the radio logger can be "forced" to send its saved noise level values to the Servicemaster device by placing the magnet at the particular position on the logger cap. After approximately 5 seconds, the status LED of the radio logger starts flashing. The logger now sends the saved noise level values each time the device flashes until the magnet is removed from the logger cap.

1.7.3 Factory settings

In general, the radio logger is delivered with a de-activated radio module! This means the radio logger signals cannot be received, and the logger has to be set to communication mode manually (see Chapter 1.7.1).

1.7.4 Network times

The radio logger needs to provide the measurement data to the network at certain times to allow the network to process such data. Online times for communication configuration with the network can be set as described in Chapter 3.2. Please note that the so-called "`Logger network times`" (see Illustration 4-3) have nothing in common with the actual "`Connection times`" of the logger. The logger network times are only required for the interaction with the network, i.e. the logger can be configured so as to communicate with the network only, with the noise level value data transmitting function being de-activated.

Start of data transmission of the radio logger determined in the "`Logger network times`" input box and the transmission period define the end of data transmission of a particular radio logger. Please note that data transmission has to end at least five minutes before the first network online time (see Chapter 3.2). This scheduled chronology is required to allow the network to receive and to process the measurement data. For a more detailed description of the programming of the network times, please refer to Chapter 3.2.

1.8 MODI radio loggers

Unlike the BIDI radio logger, the older MODI radio logger has only one operating mode, namely the data transmission mode. It continuously transmits the saved measurement data every five seconds. The MODI radio logger can also be used in combination with the network. Such a combination, however, does not require any detailed configuration for the network. A Repeater Box receives the measurement data transmitted by the radio logger, saves the data, and forwards the data to the Networkmaster at set times.

2 Waternet Program

The start screen displays four fields, which offer various program functions. The "Networks" field hosts the mask to process the single networks as described in more detail in Chapter 2.3. The "Settings" field offers access to the program settings as described in Chapter 2.2.
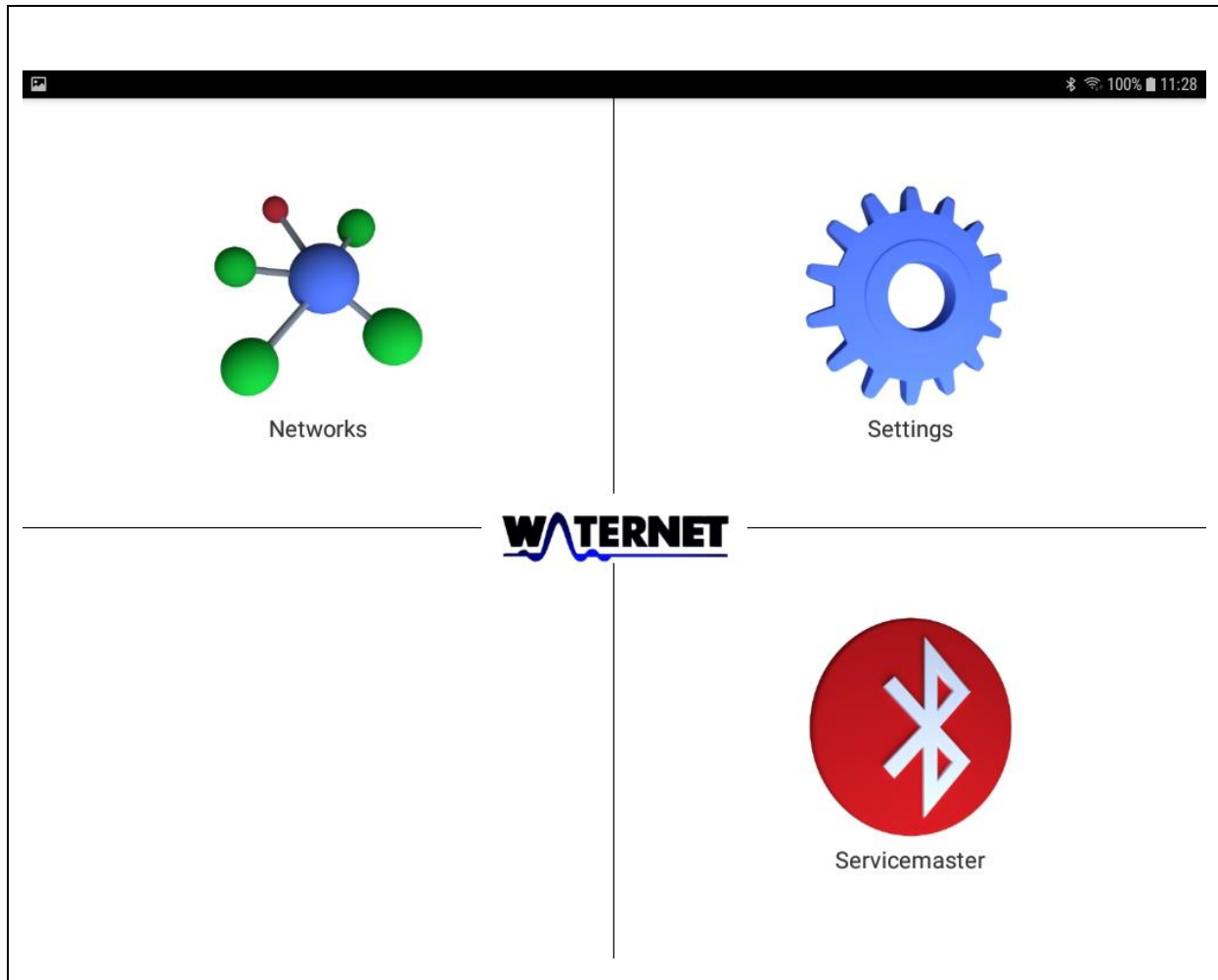

Illustration 2-1: Start screen

2.1 Servicemaster

Tapping on the "Servicemaster" field opens up a menu hosting the function of the communication via Bluetooth. The first menu item, "Connecting", is to establish a Bluetooth connection between the tablet and the Servicemaster. The "Disconnect" menu item is used if the connection between the tablet and the Servicemaster is to be disconnected again. When the tablet is connected with the Servicemaster, the system-related information of the Servicemaster can be read out by tapping on the third menu item, "Servicemaster Info".

A connection between the tablet and the Servicemaster is indicated both through the Servicemaster Bluetooth LED (see Illustration 1-3) and through the icon in the "Servicemaster" field (see Illustration 2-1). If both elements (LED and icon) are indicated in red, there is no connection between the two devices. If both elements are indicated in blue, data can be exchanged between the Servicemaster and the Waternet program installed on the tablet. If the system issues the message that data exchange is no longer possible between the Servicemaster and the tablet while the program is still operational, the connection between the two devices can be re-established through the "Connecting" menu item.

2.1.1 Connecting

Tapping on this menu item makes a dialog appear as shown in Illustration 2-2 below. The "paired devices" section shows all devices connected to the tablet so far, i.e. almost any device which has already been applied and the pairing ID of which has been entered here previously. The dialog is closed by tapping on the particular device in this section. The program will then try to establish a connection between the Servicemaster and the tablet. As soon as the connection has been established, the color of the "Servicemaster" icon on the screen will change to blue.
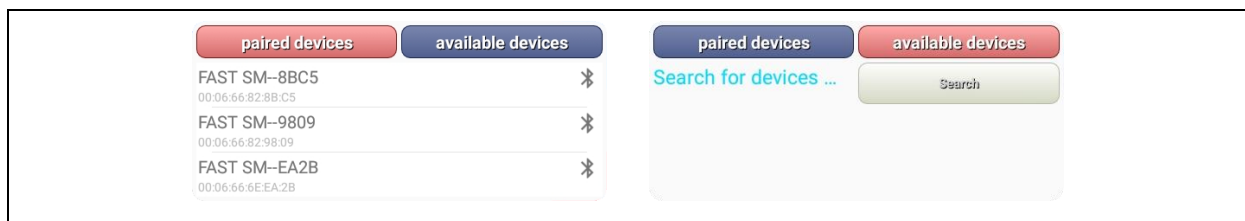

Illustration 2-2: Bluetooth devices

The "available devices" section indicates the devices located in the vicinity of the tablet. When the dialog is displayed, this section is empty, and the nearby devices will be displayed after the operator has tapped on the "Search" button. Selecting a particular device will stop the search process, and the system will try to establish a connection with this device. Please note that establishing a connection may take up to one minute. After this connecting process, the Servicemaster should be connected with the tablet and the icon in the "Servicemaster" field should be displayed in blue. If this is not the case, the process can be repeated as often as required.

2.2 Settings

This field opens the "Settings" mask where the program settings can be changed. All settings concerning the program can be adjusted through the "Program settings" button and are described in detail in Chapter 2.2.1. The settings concerning communication with the Watercloud are explained in Chapter 2.2.2.

2.2.1 Program settings

This section is to change the settings of the Waternet program. The settings of the network cannot be changed here.

 Program

If the "Program" field has been selected, a dialog opens up which can be closed again by tapping on "Close". The dialog displays the program version currently installed on your system as well as the contact data of F.A.S.T. GmbH.

 Deleting the data

The "Delete data" field allows deleting all data contained in the Waternet program. The system will issue a confirmation dialog before all data can definitely be deleted from the database. If the "Yes" button of the confirmation dialog is pressed, the data will be deleted irrecoverably. Pressing "No", however, discontinues the deleting process, and the data will remain in the program.

2.2.2 Watercloud settings

One option to process the received measurement data is to transfer the data to the Watercloud, which is a web server-based data processing system allowing storing, analyzing, and archiving the collected measurement data at a central place for years.
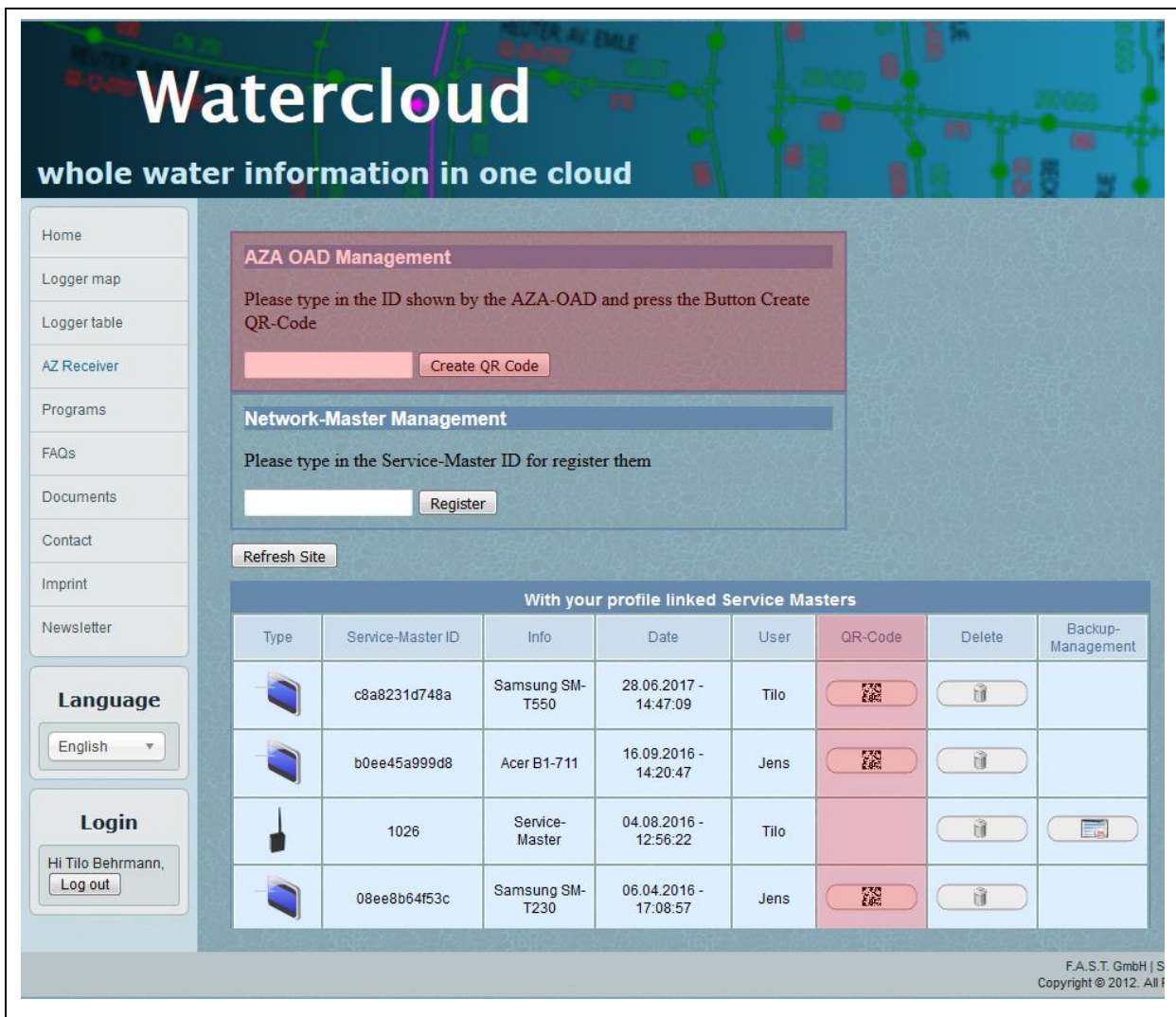
Transferring the data to your user account (see Chapter 5.1) of the Watercloud server requires access to the Watercloud and also an effective connection between your user account and the tablet applied. If you use several tablets, all tablets also need to be connected with the Watercloud server. The number of devices which can be connected with the server is not limited. If you have no user access yet, we can activate such access for you.

Another relevant point for the storage of network measurement data on the Watercloud server is that the network needs to be registered with the particular user account on the server. The data cannot be processed on the server unless the network has been registered on the server as described in Chapter 5.2.

Connecting

Please log on to the Watercloud system with your user name and your password to connect the tablet with the Watercloud user account (see Chapter 5.1). As soon as your log-in has been successful, the menu as shown in Illustration 2-3 (left part) will be displayed.


Illustration 2-3: Watercloud

Please click on the "AZ Receiver" menu item in the menu to open the page as shown in Illustration 2-3 and enter the "Device ID" of your tablet left of the "Create QR Code" button.

You will obtain the "Device ID" of your tablet by tapping on the "Connecting" menu item (in the Waternet program) and by opening the dialog shown in Illustration 2-4. The combination of letters and figures stated in red in this dialog indicates the device ID of your tablet. Please enter this device ID into the input box on the Watercloud page and then press "Create QR Code". The server will create a so-called QR code, which contains the connection-related information for your tablet.

Illustration 2-4: Watercloud connection dialog

Either position your tablet in front of the monitor so that the camera of the tablet can acquire the QR code or print out the QR code and hold the pinted-out QR code in front of the tablet camera. Please make sure that your tablet is reliably connected with the internet before you acquire the QR code with the tablet camera. The internet connection is necessary to validate the information acquired with the QR code and to confirm the log-in of the device to the Watercloud server.

As soon as the QR code has been identified by the Waternet program, the tablet will issue a short beep and the data received (such as "User ID" and "Host name") will be displayed in the dialog when the "Details" button located in the upper right corner has been tapped on. Your tablet is now connected with the user account on the Watercloud server. If you tap on "Refresh site" on the Watercloud page, the connected tablet will be listed on the device list of the Watercloud page.

2.3 Networks

Both the settings and an overview of the single networks can be opened through the "Networks" button. The mask as shown in Illustration 2-5 will appear once the "Networks" button has been tapped on. If the "Networks" mask is called for the first time, only the "<-Back", "Restore", "New", and "Search" buttons will be displayed. Pressing "<-Back" makes the operator leave the current view and return to the start screen (see Illustration 2-1).
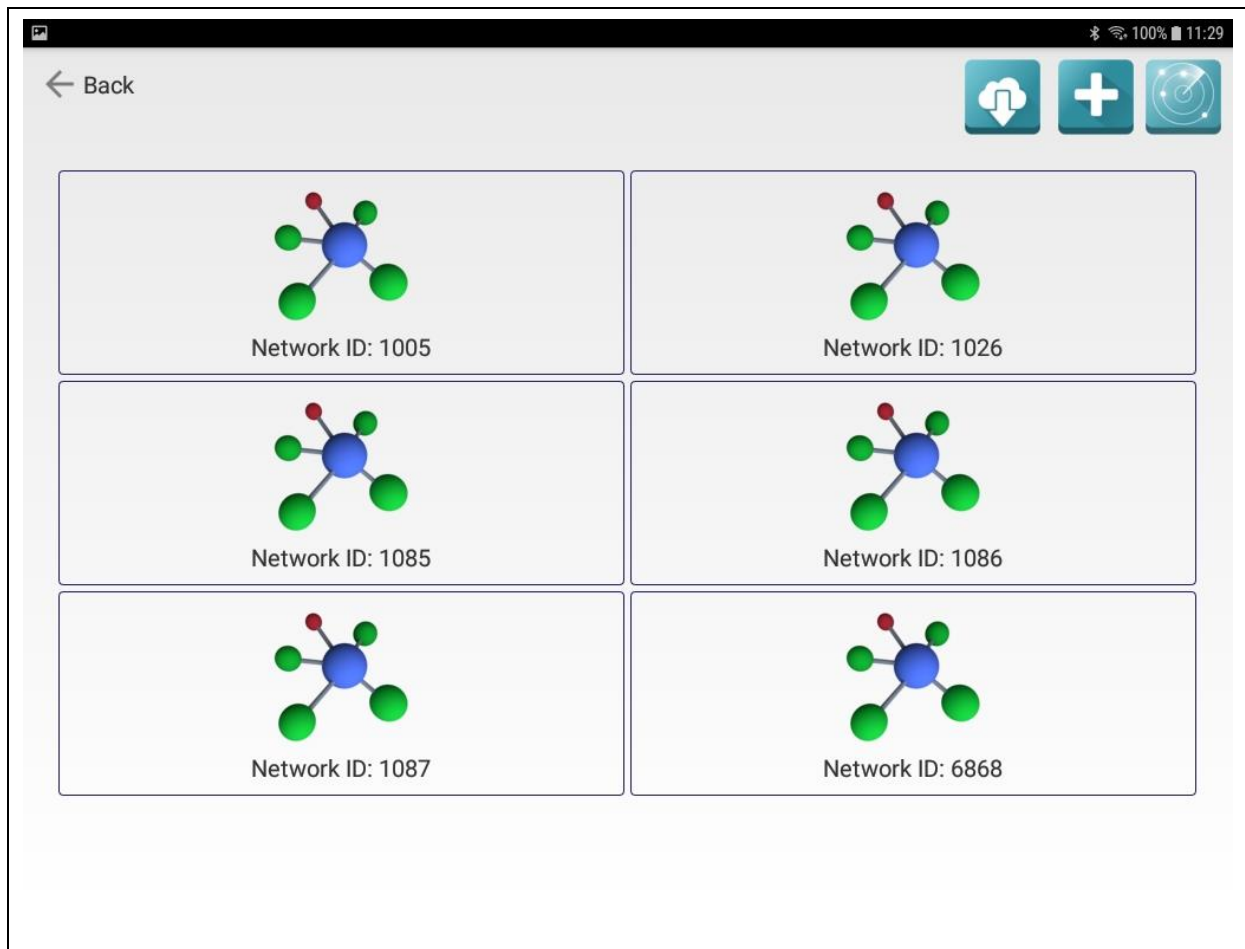
Illustration 2-5: Network mask

If networks have already been created on the tablet, a field for each network will be displayed indicating the particular network number, as shown in Illustration 2-5. Tapping on a particular field opens the overview mask of the selected network, as shown in Illustration 3-1. For a detailed description of the configuration options, please refer to Chapter 3.

If networks have not yet been created on the tablet, they can be created in three different ways: a) restoring a backup from the Watercloud system, b) through the search function, or c) creating a new network by tapping on "New".

 Restoring

If a network backup on the Watercloud server was run on a tablet previously (see Chapter 3.4), such a backup can be restored on the current tablet by pressing the "Restore" button. The button is visible only if the tablet has been interconnected with the Watercloud as described in Chapter 2.2.2.

Tapping on the button opens up a selection dialog where the particular backup version saved on the server can be chosen. Unlike as described in the restoring process explained in Chapter 3.5, the selction dialog here shows only the last backups of each network. The chosen backup can be called by tapping on it. The restoring process can be started by pressing "Use". Tapping next to the selection dialog will discontinue the restoring process.

If the selected backup version is not the requested version, other data can be restored at a later point of time as described in Chapter 3.5. Please note that any restoring process will overwrite the data currently already displayed on the tablet.

 New

With the "New" button, new networks can be created on the tablet. Tapping on the button opens up a dialog where the network number can be entered. The network number has to match the number lodges on the Networkmaster or on the Repeater Box as otherwise there will be no communication between the tablet and the other devices (see Illustration 1-1, blue data flow). The network numbers of the devices are indicated on the particular nameplates of the devices. Any name for the network can be chosen as additional information and can be entered into the "Network name" input box. As soon as all network data has been entered, the network can be created through the "Apply" button. When all network data has been created, a field will appear in the network mask (Illustration 2-5) stating the network number that has just been entered.

 Searching

Another, more comfortable, process of creating a network is by applying the search function. Tapping on "Search" will start the search for Repeater Boxes and Networkmasters located in the vicinity. If this function is activated, the button symbol in the lower left corner of the

display also starts flashing. If a network device now activates its transmission mode (see Chapter 1.5.3 and Chapter 1.6.2), the tablet will receive the particular device-related information.

As soon as the device-related information has been received, the Waternet program will create a new network (if the network is not yet available) and will display the particular network field in the mask. If the network already exists, it will not be created again. Instead, and if requested, the Waternet program will go to the settings of the network device the data of which is just being received (see Chapter 4).

2.4 Sending e-mails

Some sections of the program allow sending information or data out via e-mail. It has to be noted that sending e-mails is possible only if the tablet has been connected with the internet and a valid e-mail account has been installed on the tablet. If the function to send out an e-mail has been selected in the particular section of the program, a dialog as show in Illustration 2-6 will be displayed.

Illustration 2-6: Exporting an e-mail

The dialog above can be closed without sending out any e-mail by tapping on "Cancel". The "Search" button supports the operator in finding a specific e-mail address saved in the directory of the tablet to take the e-mail address from an already existing contact and also to assign the postal address accordingly. An e-mail address can also be complemented manually

by tapping on the first input box, which will make a virtual keyboard appear in the lower part of the screen where the operator can enter additional information. The subject line of the e-mail can also take additional information on the contents of the e-mail. If the information entered needs to be changed, just tap on the line and the keyboard will appear again.

When all relevant information has been added, the e-mail can be sent out by tapping on "Sending". Once the "Sending" button has been tapped on, a window will open in the lower part of the screen and the program to be used to send out the e-mail needs to be chosen. Usually, the "G-Mail" app is chosen to send out an e-mail with a Google account being installed on the tablet. The Waternet program will close down after the selection, and android will change to the e-mail program. When e-mail communication is finished, android will return to the Waternet program.

3 Installing a network

As soon as any of the network fields shown in Illustration 2-5 has been tapped on, the dialog as shown in Illustration 3-1 below will appear. All and any network-related settings can be configured in this dialog. The "Devices" field offers the function to change the settings of the single network devices and of the network routing. For further information on this field, please refer to Chapter 3.1 and to Chapter 4. The times when the network is to transfer data to the server can be changed and set through the "Online times" field. For further information, please refer to Chapter 3.2.
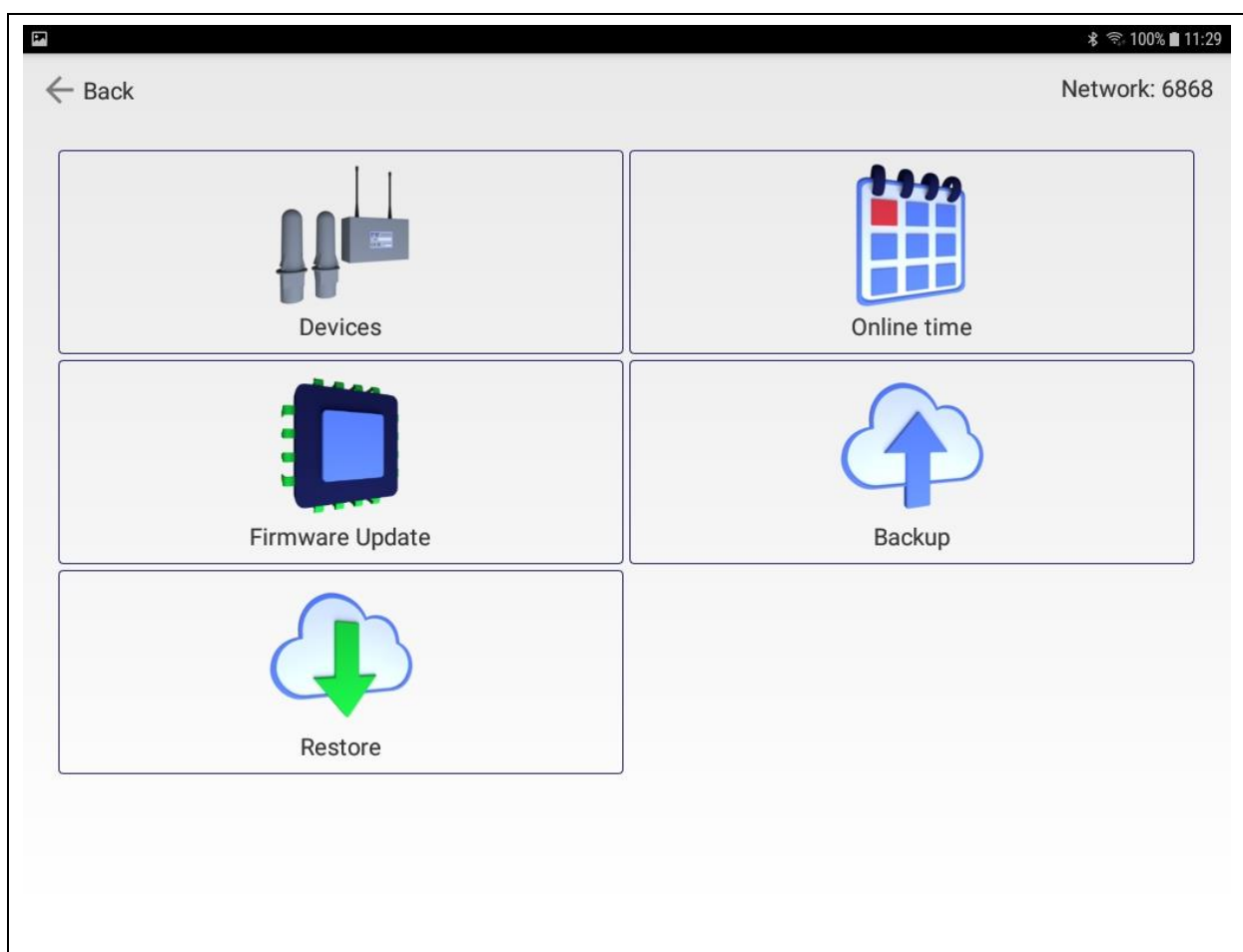
Illustration 3-1: Network mask

Tapping on the "Firmware Update" field leads to some functions required to update the software (so-called firmware) installed on the devices. For further information, please refer to Chapter 3.3. The "Backup" and "Restore" fields are used to transfer all previous network settings from the tablet to the Watercloud server as well as to save such data on the server and to restore such data from the server respectively. For further information, please refer to Chapter 3.4 and to Chapter 3.5 respectively.

3.1 Devices

Tapping on the "Devices" button makes the system offer some functions required to change the settings of a network device and to create the network structure, with the focus on creating the network structure as shown in Illustration 3-2. The network structure matches the data flow in the network (see also Illustration 1-1, red data flow) and graphically abstracts the transmission path of the measurement data from the radio loggers to the Networkmaster and from network device to network device. A network device is visualized in the network structure with a blue icon and needs to be interconnected with at least one different network device with a green line. A network device without any connection tzo another network device is not integrated in the network and is not capable of transmitting any data to the Networkmaster and thus to the Watercloud server.

Illustration 3-2: Mask to visualize the devices

If the network has been created newly on the tablet, an effective network structure is still missing. Therefore, the single network devices need to be added to the network to form the network structure. Besides the Networkmaster, the network can be extended with up to 49 Repeater Boxes. There are two options on how to extend the network: a) through the "+"

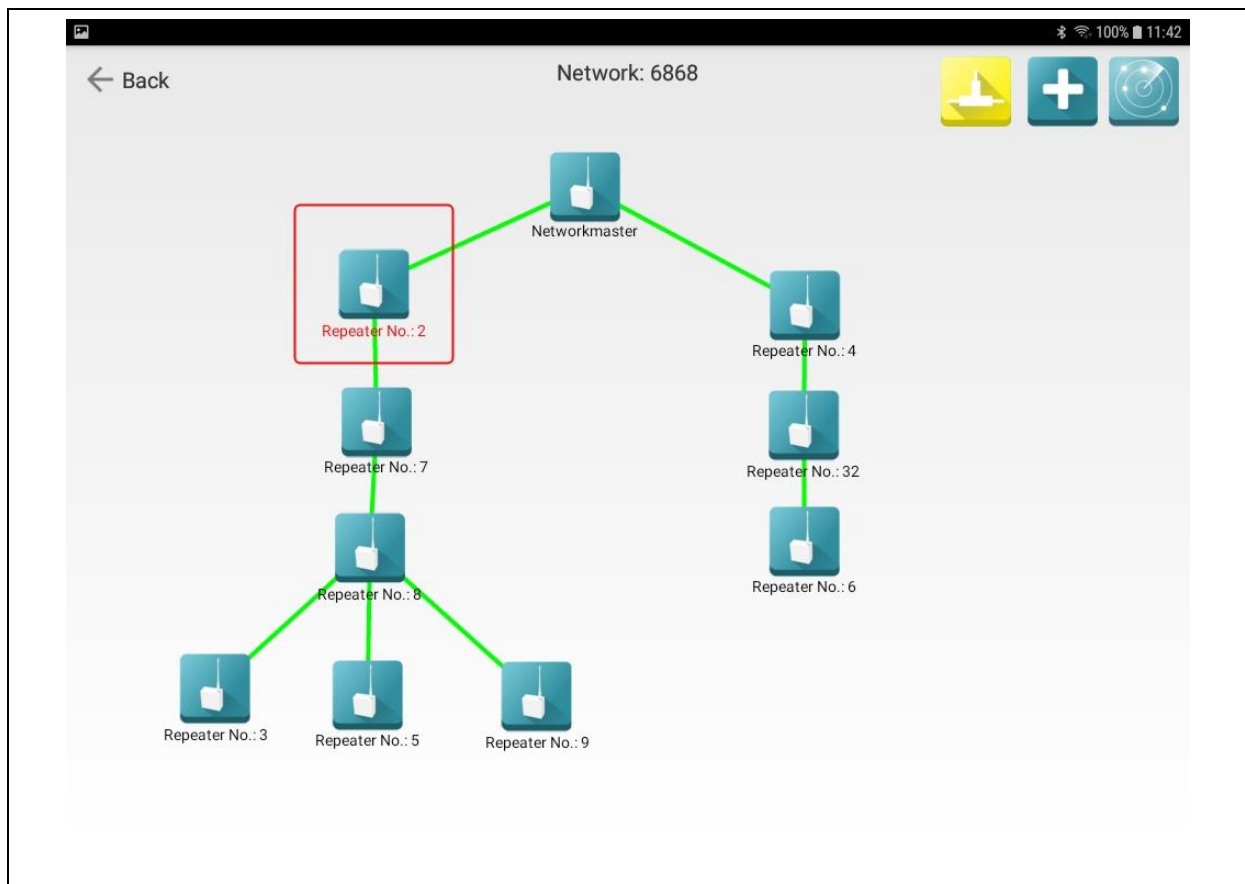button located in the upper right corner of the screen or b) through the "Search" button in the same corner. The procedure is the same like the one as described in Chapter 2.3 (Networks). The advantage of the search function is that the device-related data is directly added to the network thus virtually eliminating any transmission error.

If there are new network devices (Networkmaster or Repeater Boxes) available in the network structure, these devices can be interconnected by changing from the "Settings" mode to the "Link network device" mode as described in Chapter 3.1.1 and by tapping on the particular network device (blue icon in the network structure) displayed in the "Link network device" mode as soon as this mode has been activated. A dialog is displayed where the corresponding "Device ID" has to be selected to be interconnected with the tapped-on network device. Pressing "Start" generates a green line which interconnects the two network devices. Pressing on "Close" will cancel the process.

If a connection is to be severed or if a device has to be removed from the network, the system needs to change to the "Delete network device" mode (see Chapter 3.1.1). As soon as this mode has been activated, removing the particular network device is started by tapping on this device. Please note that if a device is removed from the network, all connections it has will also be removed.

When several devices have been added to the network structure and have been interconnected with each other, it may happen that the graphical display of the structure becomes kind of confusing. This, however, can be remedied by manually relocating the icons of the network devices slightly. If you wish to relocate the icons for a better graphical overview, please change to the "Settings" mode as described in Chapter 3.1.1. Tap on the mask for a little while to activate the relocation function. Make sure you will keep your finger pressed on the icon until the icon gets a red marking as shown in Illustration 3-2. Once the red marking has been displayed, move your finger on the display to optimize the position of the network device in the network structure. As soon as the finger loses contact to the display, the relocation process is finished.

Once the mask has been opened, the "Settings" mode is activated automatically. If a network device in the network structure is tapped on while the system is in the "Settings" mode, a mask as shown in Illustration 4-1 will be displayed. This mask offers the possibility to change some of the settings of the particular network device. For further details, please refer to Chapter 4.

3.1.1 Processing modes

The processing mode to make modifications on the network structure and on the device settings can be change in this mask. The standard mode is the "Settings" mode, which is displayed as a green icon in Illustration 3-3. The second mode is the "Link network device" mode, which is displayed as a yellow icon in Illustration 3-3. And the third mode is the "Delete network device" mode, displayed as a red icon in Illustration 3-3.
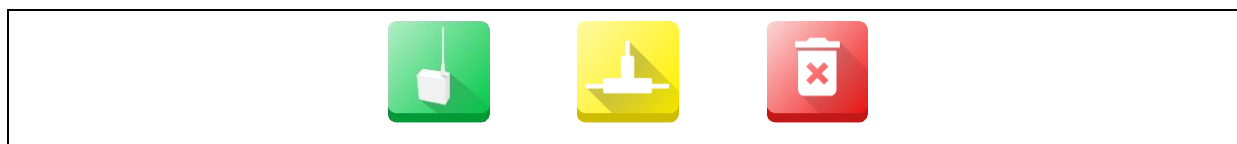
Illustration 3-3: Various processing modes

If you wish to change the mode, just tap on the corresponding button. The button will change its appearance, but not its position. This means that tapping again on the same icon will make the system change to the next processing mode.

3.2 Online times

The "Online times" function is applied to set contactability of network devices. Contactability for each network device can be set separately for every single day of the week. The network will communicate at the set data transmission times only. Please note that there will be no additional communication among the network devices or with the server at any other time. The function also hosts the settings for the network time of the BIDI radio loggers. If a BIDI logger is to transmit its measurement data via the network at a certain point of time, this point of time has to be set on the BIDI logger.

Illustration 3-4: Online times dialog

As shown in Illustration 3-4 above, two transmission times per day can be determined for the network. However, there is no necessity to activate both transmission times. If you wish to

determine only one data transmission time per day, you can input this time either at "Time-Slot 1" (green marking in Illustration 3-4) or at "Time-Slot 2" (orange marking in Illustration 3-4).

If you wish to input the time, the symbol behind the corresponding input box needs to be tapped on to open a dialog where the hour and the minutes can be set. Confirm the set time by pressing "OK", and the set time will be entered into the box. If you wish to delete the set time(s), please press "Reset". If you wish to copy the set time from the green time window into the orange time window, please tap on the letters "Time-Slot 1" briefly. The same process applies if you wish to copy the set time from time slot 2 into time slot 1: Tap on the letters "Time-Slot 2" briefly to copy the set value into time slot 1.

Also the BIDI radio loggers applied with the network need to have a set time for data transmission (blue marking in Illustration 3-4). The logger will switch on at the set time to communicate with the corresponding network device. The chosen point of time has to be set to a time at least 35 minutes prior to the earliest online time of the network.

3.3 Firmware Update

PLEASE NOTE: WHEN A FIRMWARE UPDATE IS RUN, THE SERVICEMASTER NEEDS TO BE CONNECTED TO POWER WITH A USB CHARGER CABLE.

The mask to run a firmware update is reached through the "Firmware Update" field. Please note that the corresponding field of the particular device subjected to the update then needs to be tapped on: Servicemaster, Networkmaster, or Repeater Box. As soon as one of the three fields has been tapped on, the dialog as shown in Illustration 3-5 (left part) will appear.
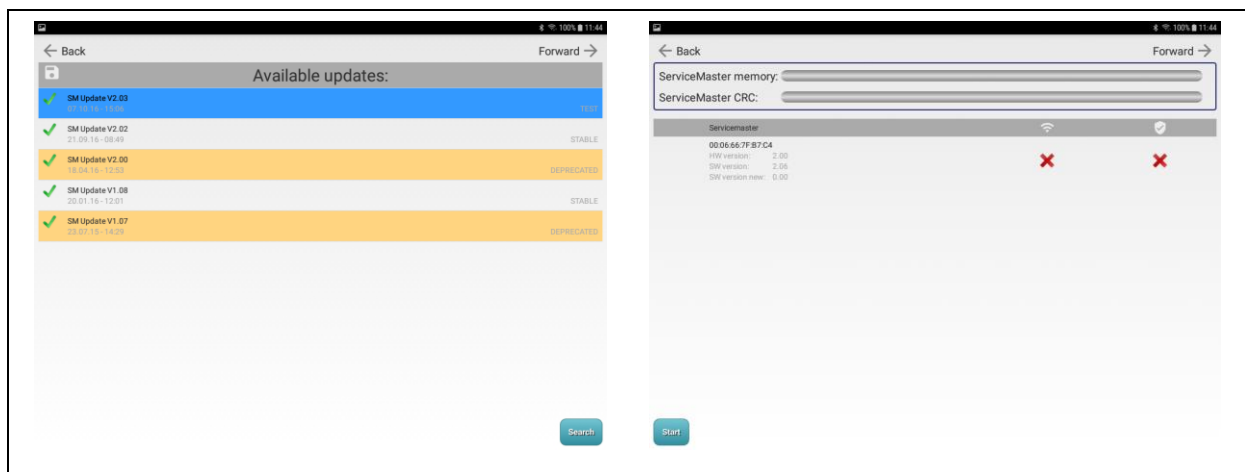

Illustration 3-5: Firmware update 1 / 2 mask

All firmware updates are lodged on a server of our company. Therefore, it is improtant that the tablet is connected to the internet before the firmware update is started and that the internet connection is maintained until downloading the update(s) is completed. Tapping on "Search" will start an enquiry of the Waternet program directed to our server whether a new firmware update for the radio loggers is available. If there are new updates available, these updates will be listed on the table as can be seen in Illustration 3-5 (left side). If there are no updates available, the enquiry does not provide any results and the table will remain empty.

New, listed updates should be marked with a green tick at the beginning of the line. If, however, a gear is displayed instead of the green tick, the program is currently running a download of this particular update. Such a download may take a little while and is subject to the quality of the internet connection. Lines marked with a red "X" cannot be used as downloading the update has failed or the downloaded update is flawed. Pressing "Search" again will start the download of the flawed or failed update again.

When the update download process is completed, a firmware update can be selected by tapping on the desired line. The selected update line will then be displayed in blue, as shown in Illustration 3-5 on the left. Once the particualr update has been tapped on, the program will change to the next mask, which is shown in Illustration 3-5 on the right. In this mask, the actual update process can be initiated by pressing "Start". The upper part of this mask shows the four progress bars if an update has been selected for a Repeater Box or for the Networkmaster. If an update has been selected for the Servicemaster, just two progress bars will be displayed. The progress bars indicate the actual status of the current update process.

First, program data is sent to the Servicemaster, as indicated after "ServiceMaster memory:". When the bar is completely blue, the step has been completed successfully. As a second step, the program-related data saved on the Servicemaster memory is checked. A completely blue bar after "ServiceMaster CRC:" indicates that this step too has been completed successfully. If the selected update is an update for the Servicemaster, the update process can be started now by tapping on "Yes" in the dialog displayed.

If, however, the selected update is an update for a Repeater Box or for the Networkmaster, a third and a fourth pre-update data transfer step are conducted before the actual update process can take place: The Servicemaster transmits the program-related data to the selected radio logger (progress is indicated after "Device memory:"), and finally the program-related data is checked in the network device (progreewss indicated after "Device CRC:"). When all four

status bars are completely blue, the network device automatically starts the firmware update. The update itself takes only a few seconds.
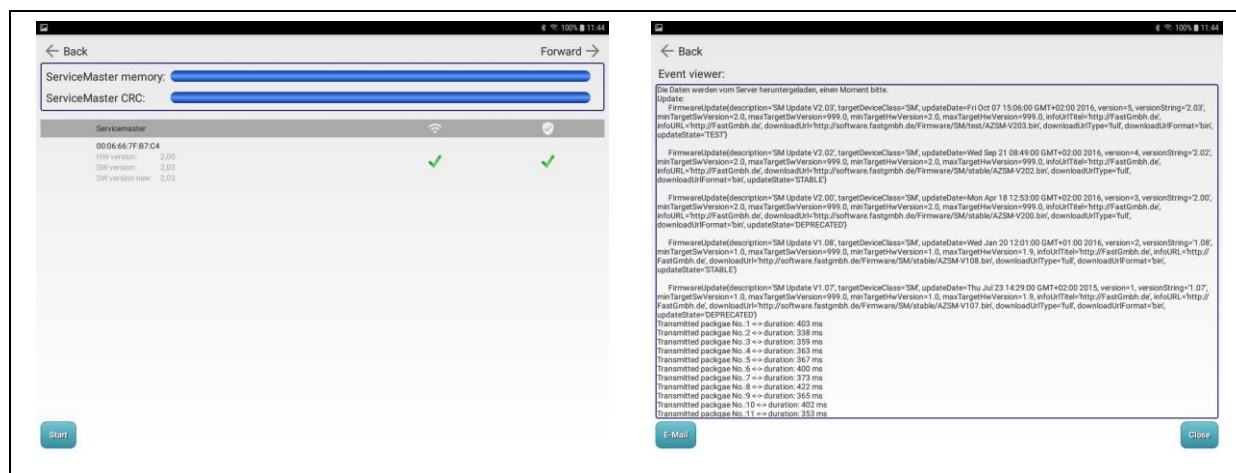

Illustration 3-6: Firmware update 2 / 3 mask

When the firmware update is completed, the mask as shown on the left part of Illustration 3-6 is displayed. Every device, be it the Servicemaster, a Repeaterbox, or the Networkmaster, should have two green ticks after an update. The first tick indicates that the device was subject to successful communication, the second tick indicates that the firmware has been uploaded successfully. If the table shows a device without those two green ticks, the firmware update could not be run on this particular device. However, tapping on "Start" will re-start the uploading process for such a device.

The update progress is not only displayed graphically but also as a text file (log file) and can be read in the "Event viewer". The file can also be forwarded to other computers through the "E-mail" button. If the firmware update is flawed, the particular error can be identified with the log file. Pressing on "Forward" guides the operator to the "Event viewer", as shown on the right side of Illustration 2 23.

3.4 Running a backup

The current settings for a network can be backed up on the Watercloud by tapping on "Backup" if the tablet has been connected with an account on the Watercloud (as described in Chapter 2.2.2) and an internet connection has been established. As soon as the button has been pressed, a dialog is displayed where brief information on the backup version to be created now can be entered. Tapping on "Continue" in this dialog will start the backup process. Tapping on "Cancel" will cancel the backup process. Please note that only the data of the current network indicated in the mask is being saved. If the tablets hosts several

networks the backup process needs to be conducted separately for every single network. The data can be saved as often as required. Every backup is saved on the Watercloud server together with the date, the time, and the network ID and cannot be deleted through the tablet.

3.5 Restoring the data

Backups created previously can be downloaded from the Watercloud server and can be restored on the tablet by pressing ”Restore“. This data restoring process, however, also requires an operational internet connection between the tablet and the server as otherwise the requested data cannot be called from the server. When the ”Restore“ button has been tapped on, a selection dialog will appear which shows all backups available for the particular network number. The single backups are listed in a historic order, with the latest backup being at the top of the list. For every backup, an information text is displayed after the date and the time if such information was entered on the creation of the particular backup. If you wish to restore a backup, just tap on the requested backup and thus mark it at the beginning of the line. Then tap on "Use“ to start the data restoring process for the selected backup. Tapping beside the selection dialog will cancel the entire restoring process. Please also note that all data saved on a tablet will be deleted when a backup is uploaded.

4 Device set-up

After tapping on a device symbol (Illustration 3-2) in the "Settings" processing mode (see Chapter 3.1.1) in the network structure, the mask as shown in Illustration 4-1 will appear. This mask offers some functions to adjust the particular network set-up. The corresponding network device and the network itself are indicated in the upper right corner of the display. Tapping on "<-Back" guides the operator back to the mask as shown in Illustration 3-2.
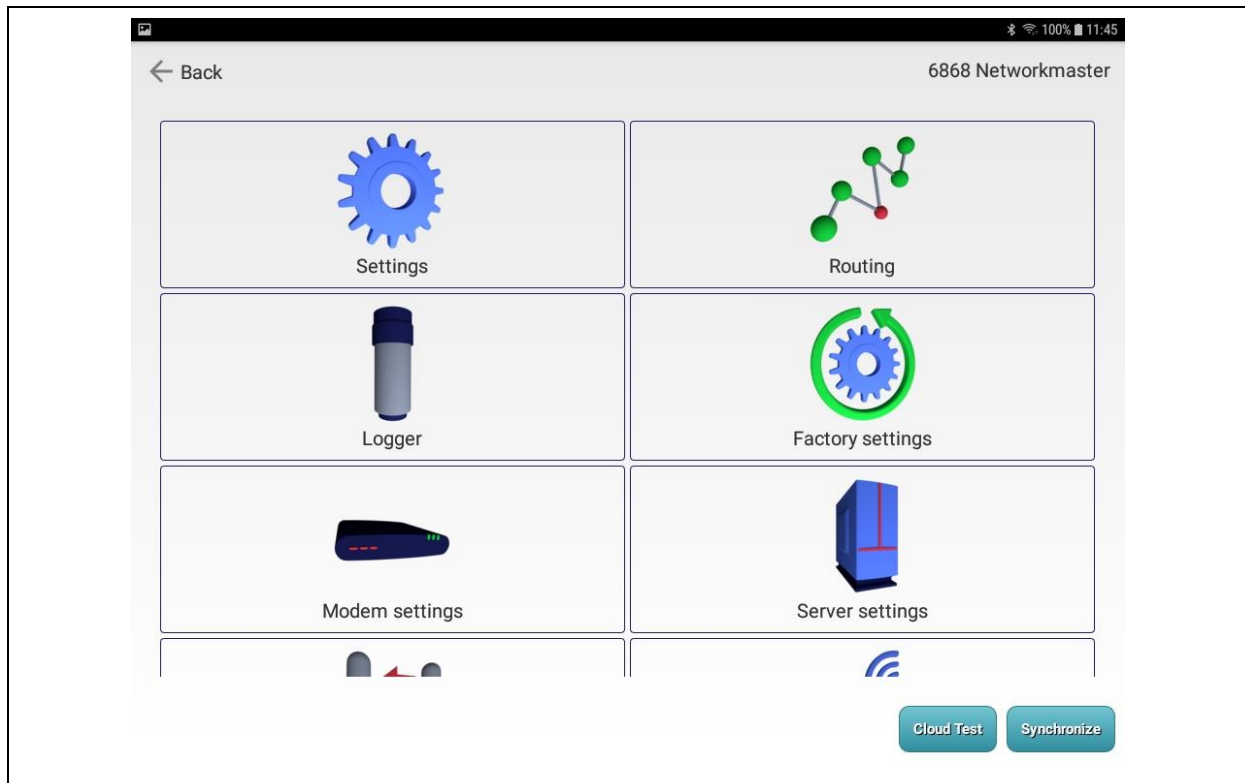
Illustration 4-1: Device set-up mask

Please note that the configuration changed on the tablet will not be available on the network device right away as the changes made need to be transferred to the network device first by pressing "Synchronize" to initiate data synchronization as described in Chapter 4.11.

4.1 Settings

The "Settings" field offers the possibility to call network device-related information and also to change the time set on the device. Please note that the device-related information is not available unless the device has been read out. In order to obtain any information from a device, the device needs to be synchronized beforehand as described in Chapter 4.11. The data in the mask will be up-to-date and can be processed, if required, as soon as the synchronizing process has been completed.

The only parameters that can be changed on the network device here are the time and the summer time setting. If you wish to adjust such data, please tap on the symbol after the particular input box. The dialogs appearing allow data adjustment, and tapping on "OK" will make the mask accept the changed data. Pressing "Cancel" will terminate the process. Please note that the data is not yet available on the device as it has been changed on the tablet only. Therefore, a new data synchronization process between the tablet and the network device needs to be initiated (Chapter 4.11) after the data has been changed on the tablet.

4.2 Routing

The "Routing" field offers the option to change the set network structure of the particular network device manually. As already described in Chapter 3.1, the program automatically creates a network structure, the so-called "Routing", by interconnecting the single device icons in the "Devices" mask (see Illustration 3-2). The operator is advised not to change the created network structure manually as a manual change may cause malfunctions. The mask appearing after the "Routing" field has been tapped on offers a corresponding icon of any possible network device. Any icons displayed in yellow is not yet created in the network and cannot be processed. An icon displayed in blue indicates that there is a connection to this particular device. An icon displayed in red indicates that a connection to this device has not yet been established. Tapping on such an icon opens up a dialog where a device of the network can be selected. With the "Apply" button, the selected device number can be saved. After all network device have been interconnected (see Chapter 3.1), this mask should display only blue and yellow icons. If this is not the case, the easiest way to get only blue or yellow icons is to delete the particular network device in the "Devices" mask (Illustration 3-2) and to add it again and to interconnect it subsequently.

4.3 Loggers

The allocation of the radio loggers constitute a crucial issue for the network settings as the allocation of the loggers to the single network devices allows data transmission of the data gathered by the loggers to the server. If a Repeater Box or the Networkmaster has not been assignet to a logger, the device just acts a node for the gathered measurement data and transmits such data as per the defined network structure. This may be necessary if the range of the radio signal is not strong enough to cover longer distances. In such a case, another Repeater Box without any radio logger assignment can be integrated in the network as a node to extend the range.
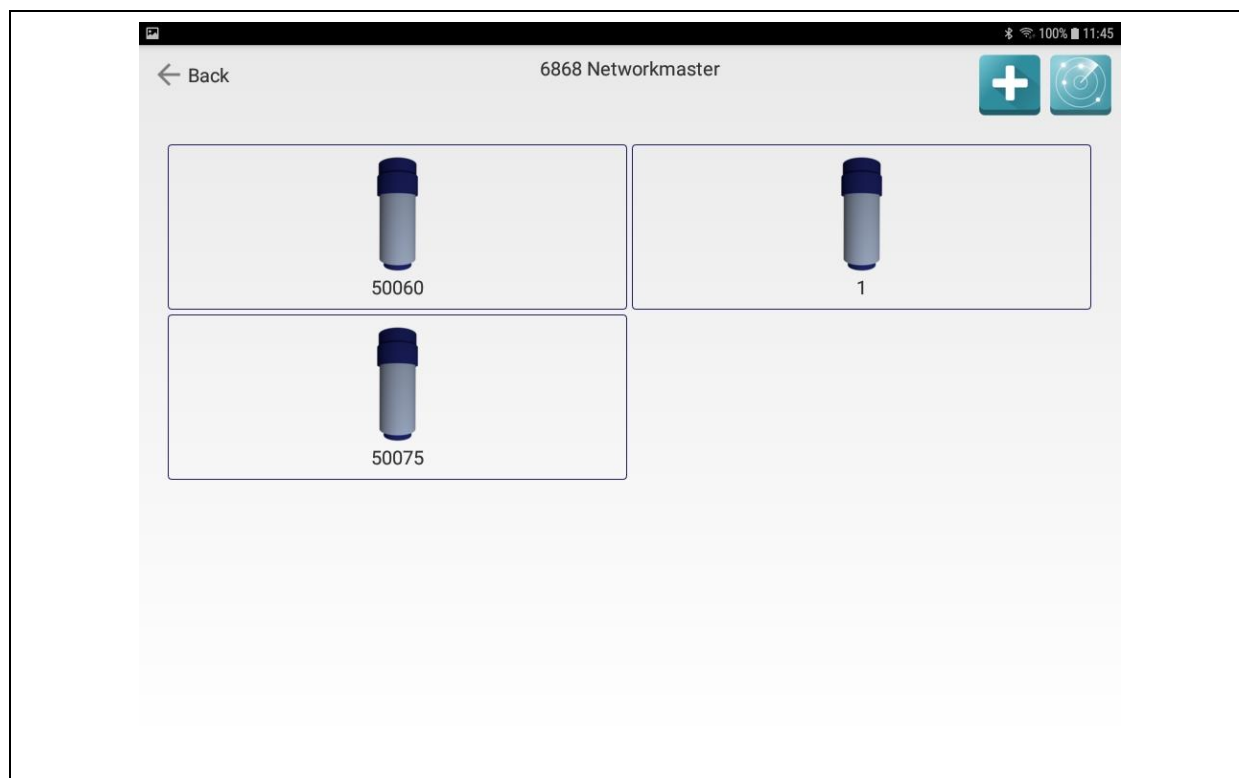
Illustration 4-2: Logger overview mask

Once the "Logger" field has been tapped on, the mask as shown in Illustration 4-2 is displayed. This mask allows the assignment of a radio logger to a network device either through the "New" button or through the "Search" button. If "New" (indicated as a „plus" symbol in the upper right corner of Illustration 4-2) is pressed, a dialog will appear where the serial number of a radio logger can be entered. Tapping on "Apply" then in this dialog makes the system accept the entered serial number, and a new logger is created in the program. A field will appear on the "Logger Overview" mask (see Illustration 4-2) with the corresponding radio logger serial number.

Another option to create a radio logger is through the search function, which can be started with the button to the right (see Illustration 4-2). If this function has been activated, also the button icon starts flashing once a second in the lower left corner of the display. If you wish to start the search function, please make sure that the corresponding network device is set to communication mode (see Chapter 1.5 and Chapter 1.6). This setting is required if you wish to search for radio loggers positioned in the vicinity of a Networkmaster or of a Repeater Box.

If the network device has been set to communication mode and the search function has been started, a data reception dialog will open up as soon as a radio logger has been received, and the serial number of the particular radio logger serial number will be displayed. Tapping on

"Apply" will assign the logger to the particular network device. At the same time, the reception dialog indicates the signal strength of the signal transmitted between the network device and the radio logger. Please make sure that the signal strength value is always higher than 30 as otherwise data transfer between radio logger and network device does not operate properly. Tapping on "Cancel" or tapping on "Search" again in the reception dialog terminates the search for radio loggers. If there is no reception dialog displayed or if the radio logger searched for is not displayed, the transmission function of the loggers has possibly not been activated. In this case, the radio logger can be forced to transmit the data, as described in Chapter 1.7.2.
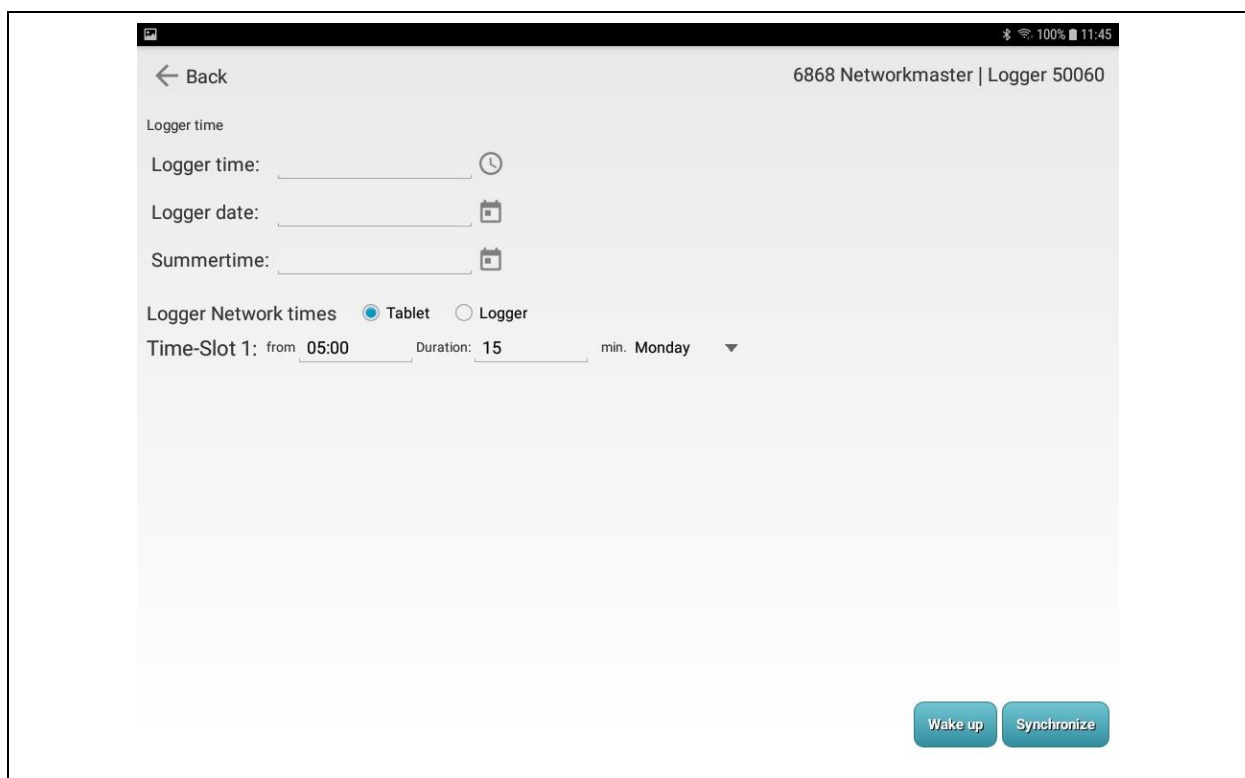
Illustration 4-3: Logger settings mask

When the radio loggers have been assigned to the network device, the loggers still need to be adapted to the network. In order to conduct such a configuration, just tap on the corresponding field of the particular radio logger displayed in the "Logger Overview" mask (see Illustration 4-2). The mask as shown in Illustration 4-3 will open up, and you can enter the network times into the radio logger. This step is required to make the logger transmit its measurement data to the network at the defined point of time. The transmission time for the radio logger can be determined as described in Chapter 3.2.

A radio logger should be read out before the settings in the mask are changed. In order to read out a logger, press "Synchronize" to open a dialog where the "Download" button needs to be tapped on. If the radio logger is not set to communication mode but to transmission mode, the logger needs to be woken up first. If the setting of the logger allows the logger to be woken up (see Chapter 1.7.1), the logger can be set to communication mode with the "Wake up" button. The communication mode is the mode where the logger can be programmed and can be read out. If the logger is set to a mode which does not allow waking up, the program will generate an error message and the radio logger has to be woken up with the magnet and thus be set to communication mode.

As soon as the radio logger has been read out successfully,the mask as show in Illustration 4-3 indicates the received times of the logger. If the time or the date is not correct, it needs to be adjusted by tapping on the button behind the corresponding box to open a dialog where the data can be changed. In "Logger Network times", a time must be set when the "Tablet" button has been selected. If this is not the case, the network times have to be set first as described in Chapter 3.2. As soon as all settings are correct, the radio logger settings can be programmed. Tapping on "Synchronize" again and then selecting "Upload" will start the programming process to transfer the data to the radio logger.

4.4 Factory settings

This function allows the operator to reset the settings of the network device to the original factory settings. Please note that also existing connections to other devices in the network structure (see Illustration 3-2) will be deleted by the reset process. Furthermore, this reset process only takes place on the tablet. If the corresponding network device is to be reset, too, the network device needs to be synchronized with the tablet again after the reset on the tablet (Chapter 4.11).

4.5 Modem settings

This field is displayed only when the Networkmaster settings are being processed. The Networkmaster is the only device of the network to be equipped with a mobile communications modem, which allows transmitting the collected measurement data to the Watercloud server via internet. If you wish to have the data transmitted via the cellular radio system, the "Access Point Name" (abbreviated with APN, also "*access point*") of the particular mobile phone company has to be entered. The "APN user" name and the "APN

password" are not mandatory and can be left blank, if required. Also, the SIM-PIN (*subscriber identity module* – *Personal Identification Number*) can be input in the dialog which appears when the "Modem settings" field has been tapped on. However, this input box can also be left blank, if required. Tapping on "Apply" allows saving the entered data for the network. The data can subsequently also be transferred to the Networkmaster after synchronization.

4.6 Server settings

This field, too, is displayed only when the settings of a Networkmaster are being processed. Also, the access data to be input may be complemented automatically by the Waternet program if the tablet has been interconnected with the Watercloud server as described in Chapter 2.2.2. Nevertheless, supplementing the required access data manually is also possible.

Once this field has been tapped on, a dialog appears where the domain of the server has to be entered into the first input box. The domain structure is as follows: "www.DomainName.tld". In most cases, data is exchanged with the Watercloud server, the domain of which reads "www.water-cloud.de". The second input box serves to lodge the path on the server to the server files necessary for data exchange. The "User ID" for the Watercloud server is entered into the third input box. This user ID has to match the user ID lodged on the Watercloud server when the server is used. Finally, the port has to be lodged in this dialog. In most cases, and when the Watercloud server is used, the port number is 80. The entered data can be saved for the network by tapping on "Apply", and the data can also be transferred to the Networkmaster later on during data synchronization with the Networkmaster.

4.7 Data reception test

This button allows starting a data reception test which will measure and indicate the radio signal strength. If network devices have been interconnected with each other in the network structure (see Illustration 3-2 and Chapter 3.1), these devices should also be capable of communicating with each other in reality. If this is not the case, the created network structure is useless. Please note that the data reception test can be run only if both network devices are set to communication mode (see Chapter 1.5 and Chapter 1.6).

Once the data reception test has been started, the signal stregth is indicated in the left part of the data reception dialog displayed. The signal strength should be at least between 25 and 30

to ensure troublefree communication between the network devices. If the signal strength is below 25, troublefree communication cannot be guaranteed. If you wish to cancel the data reception test, tap on "Cancel".

4.8 Stand-by time

Currently the firmware does not support this function in full. Future firmware versions will offer the feature to extend the time for the communication mode of a network device. Once the network device has been switched on, it is set to communication mode only for a certain period of time until it automatically leaves this mode after 5 to 10 minutes.

4.9 Location

This function allows acquiring the coordinates of a location of a corresponding network device. It is recommended to acquire such coordinates as close to the network device as possible once the device has been positioned at its destination. Such location-related data is acquired through an integrated GPS receiver (*Global Positioning System*) subject to the tablet applied or through the position marks of WIFI networks in the vicinity. In either case, tapping on this field will start the data acquisition process, which may take a little while. If the latitude and the longitude are indicated in the dialog appearing on tapping, the data can be saved on the tablet by pressing "Apply".

4.10 Log file

All settings and data of a network device (Networkmaster see Chapter 1.5, and Repeater Box see Chapter 1.6) will be saved on the memory of the device. If an error occurs, reading out this information can give some hints on which data or setting may have caused the error. It is possible to read out such data by pressing this button. The read-out process can be started as soon as the connection between the Servicemaster and the tablet has been established (see Chapter 2.1.1). Furthermore, the corresponding network device has to be switched on (see Chapter 1.5 and Chapter 1.6) to allow data read-out.

Once the information has been read out, a dialog appears displaying the data. This dialog can be closed by tapping on "Close". The information displayed in the dialog can be sent out via e-mail by tapping on "E-Mail" (for the full process, please refer to Chapter 2.4).

4.11 Synchronizing settings

When the settings have been changed on the tablet (Chapter 4,), the new settings need to be synchronized with the corresponding network device. Data synchronization between the tablet and the network device is started by tapping on "Synchronize" (see Illustration 4-1). Please make sure that the network device to be subjected to data synchronization is set to communication mode (see Chapter 1.5 and Chapter 1.6). If the network device is not set to communication mode, an error message will be generated by the system and data synchronization has to be started again.
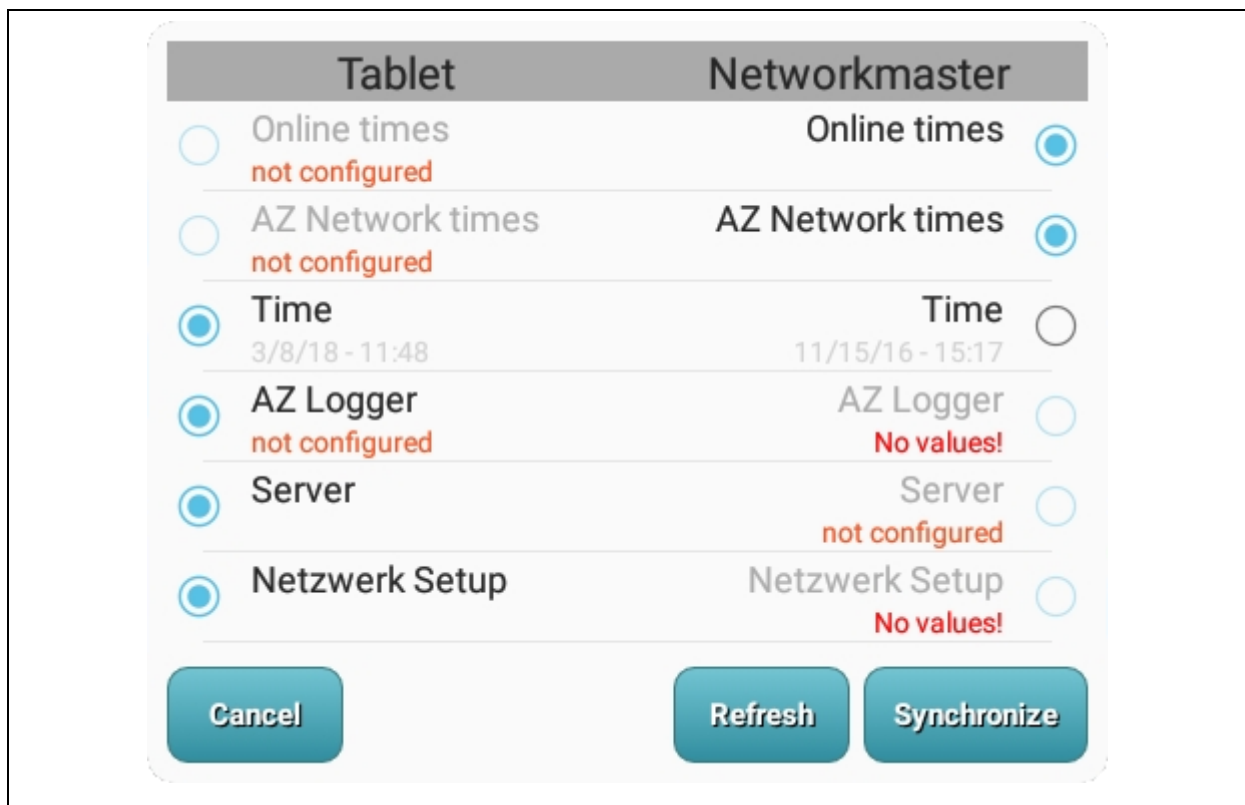

Illustration 4-4: Synchronization dialog

Data between the devices is synchronized in two steps: first, the settings of the network device are read out and compared with the data lodged on the tablet. A dialog as shown in Illustration 4-4 will be displayed and indicate all differing settings of the two devices (left side: tablet data, right side: network device data). Either setting of a particular line can be marked (tablet side or network device side) depending on which setting is to be applied. A setting is marked by tapping on the circle symbol either at the beginning of a line or at its end. The tapped-on circle symbol is then filled with a dot. If neither of the two settings is to be synchronized, tapping on the filled circle will delete the marking of the particular setting.

If the settings of a particular device do not make any sense, the circle symbol cannot be selected. Such an example is shown in Illustration 4-4. If a device stated in a line reads "No values!", this setting cannot be selected. The same applies to the indication "not configured". The difference between "No values!" and "not configured" is that the latter can be selected only if paired with the first. Moreover, "not configured" indicates a setting which is even allowed in certain cases. For example, if a Repeater Box serves as a node and thus does not receive any data issued by a radio logger, the setting "AZ Logger" can be selected in combination with the value "not configured".

The second step in data synchronization of the two devices is to transfer the selected settings to the particular device. This step is initiated by tapping on "Synchronize" (see Illustration 4-4). All settings marked on the tablet side are now transferred to the network device and saved there, and all settings marked on the network device side are transferred to the tablet and will be saved on the tablet. When all settings have been successfully transferred to and saved on the particular devices, the dialog will close automatically. If an error has occurred, an information dialog will appear indicating a corresponding message, and all lines in the dialog containing an error remain visible in the dialog.

If a new attempt is to be made to synchronize the setting data, tapping on "Refresh" will start another read-out process on the network device and thus start the synchronization process. Tapping on "Cancel" closes the entire dialog, and the synchronization process will be terminated without any data synchronization.

4.12 Cloud test

The "Cloud test" button is visible in the device set-up mask (see Illustration 4-1) only if the device to be configured is a Networkmaster. Also, synchronizing the settings of the tablet and of the Networkmaster must have been completed successfully (see Chapter 4.11). The Cloud test function offers the possibility to test the connection and the data exchange quality between the Networkmaster and the Watercloud server in a simple way, i.e. if the test has not been successful, it can be assumed that also at a later point of time measurement data will not be transferred.
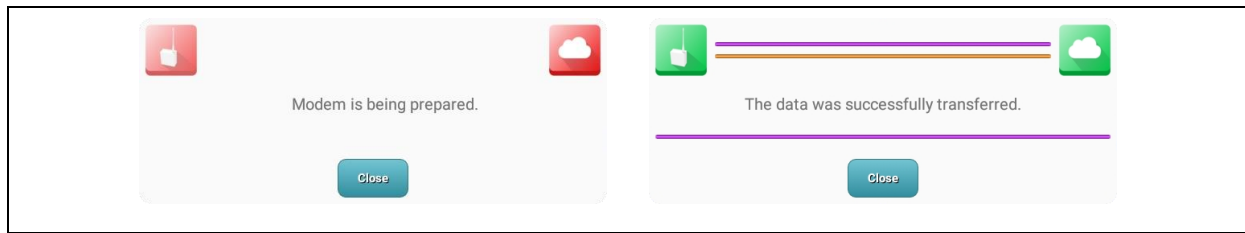
Illustration 4-5: Cloud test dialog

The test is started by tapping on "Cloud Test". A dialog as shown in Illustration 4-5 (left side) will be displayed, and the connection test starts as soon as this dialog has appeared. At the beginning of the test, all symbols at the corners are marked red. This indicates that neither the Networkmaster (s*ymbol in the left corner of the dialog*) nor the server (s*ymbol in the right corner of the dialog*) has received or transmitted any data. The color of the symbols will change to yellow and finally to green in the run of the test. Yellow means that data has been sent or received, and a green symbol in both corners as shown in Illustration 4-5 (right side) indicates that test has been completed.

Data exchange between the Networkmaster and the server has failed unless both symbols are displayed in green. If the Networkmaster symbol is green and the server symbol is yellow or red, the failure has been caused by the server settings. If, however, the Networkmaster symbol is yellow or red, the error is on the Networkmaster side.

5 Watercloud

5.1 User account

A user account for the Watercloud can be purchased from <u>F.A.S.T. GmbH</u>. As soon as F.A.S.T has released access, the user can log in to the Watercloud with his/her name and password through the "Login menu" (see Illustration 5-1) to use the system. Log-in is conducted by entering the access data by pressing "Login". As soon as the user has logged in, the "Logger map" and "AZ receiver" menu items are activated and the Watercloud system can be applied. The "Logger map" menu item opens the cartographical measurement data management function, and tapping on "AZ receiver" opens the management page of the networks and tablets connected to the current user account.
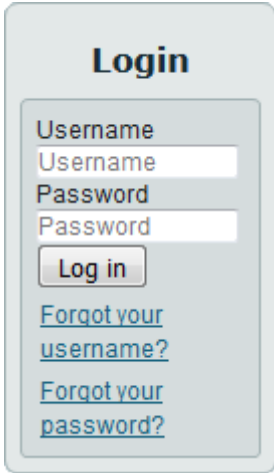

Illustration 5-1: Login menu

If the "Remain logged in" field is ticked, the user remains logged in to the system until the "Log off" button has been pressed even if the browser window is closed. When the Watercloud system is opened again, the user is already logged in and can continue using the system without having to log in again.

5.2 Network registration

A network needs to be registered on the Watercloud server before it can transmit its data to the server and the data can be saved on the server. After the log-in to the server (see Chapter 5.1), the "AZ receiver" button marked red and positioned on the left side in Illustration 5-2 can be tapped on. This will open the website (as shown in Illustration 5-2) where the network can be registered.
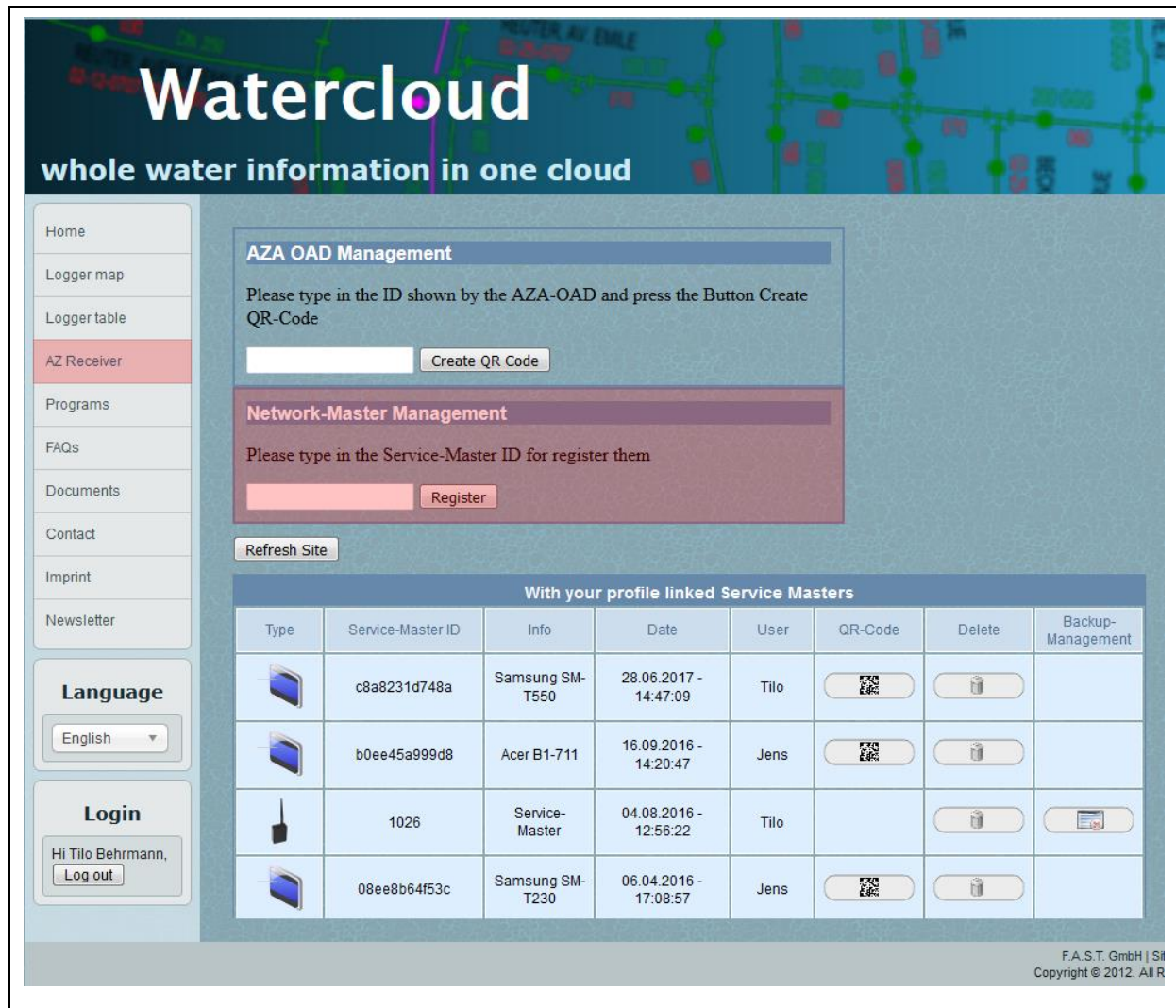
Illustration 5-2: Network registration

If you intend to register a network, the particular network ID of the Networkmaster needs to be entered in the box marked red. Pressing "Registration" subsequently will register the network on the server. This registration will be indicated in the table below the red section.

If you wish to delete a network from a user account, just look for the line in the table that contains the particular network ID. Press the "Delete" button (the symbol of which is a little bin) to delete the network from the server.

5.3 Data backup

As already mentioned in Chapter 3.4, backups created previously cannot be deleted through the tablet. A backup can only be deleted through the Watercloud, and before a backup can be deleted, the user will have to log in to the Watercloud server with his/her account.
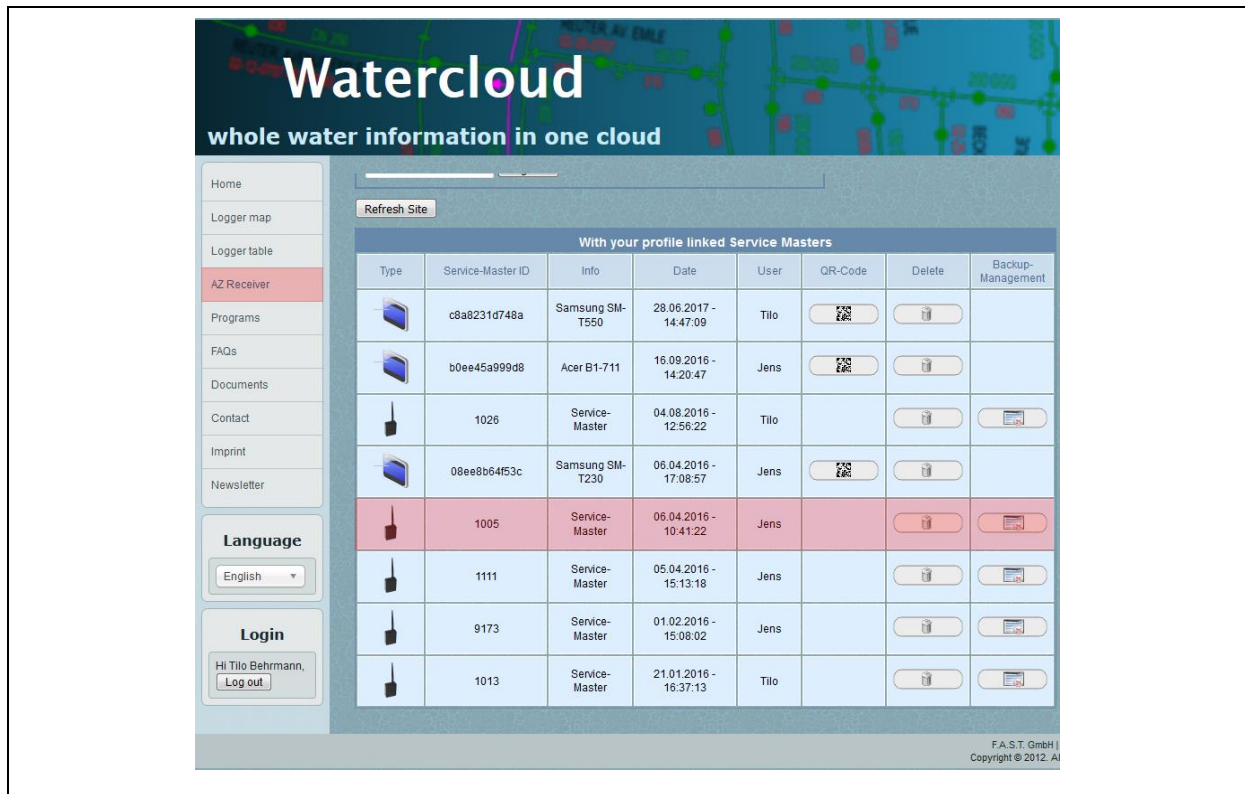
Illustration 5-3: Receiver management

Tapping on "AZ receiver" (see Illustration 5-3) in the menu bar (left side) will open up the Receiver Management page. The list displayed now shows all tablets registered on this account and all networks. The section marked red in Illustration 5-3 is such a network. The button to open Backup Management for a certain network is positioned at the end of the particular line. Tapping on this button opens up the dialog as shown in Illustration 5-4.
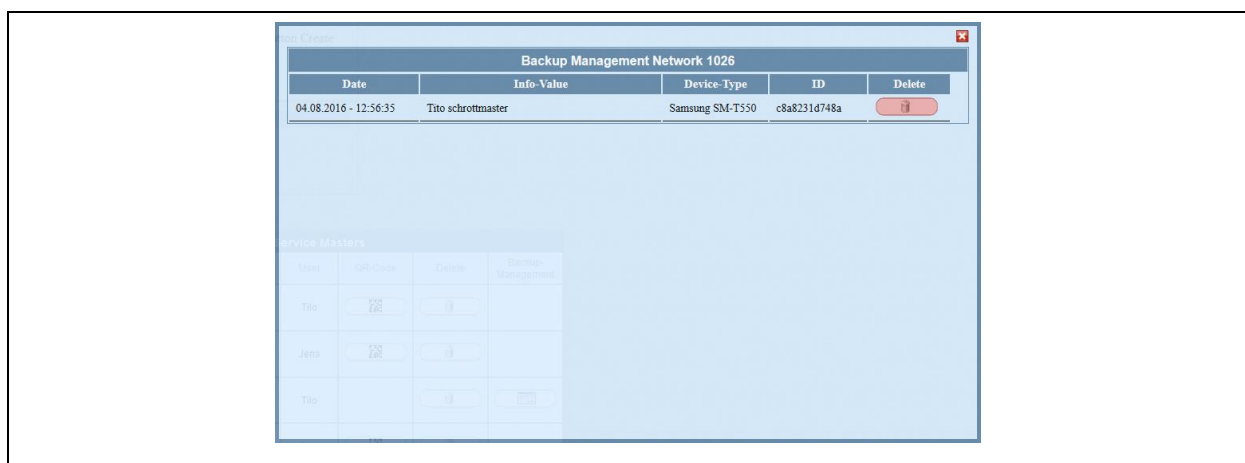

Illustration 5-4: Data backup management

This dialog indicates all network backups saved on the server. Tapping on the button at the end of a line will delete the particular backup. The deleted data will no longer be available.