

User Manual

TSDiag+

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1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.



Danger

This symbol is used to refer to instructions which, if ignored or not carefully followed could result in personal injury.



Note

This symbol indicates application tips or supplementary notes.



Reference to source of information

This symbol refers to detailed sources of information on the current topic.

1.2 Safety Notes

- Read this manual carefully before using the software. Keep this manual in a place where it is always accessible to all users.
- The user manual, in particular the safety notes, must be observed by all personnel working with the software and the programmed device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

- The software is to be used exclusively for remote diagnostics of operating devices located in a network. Any other use is not permitted.



Danger of life!

Do not use this software for remote operation of safety-relevant machinery or systems!

It is also not permitted to use this software for teach-in of machines and systems for which parts of the safety chain are put out of operation!

1.4 Target Group

All configuration and programming work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

2 General Description

TSDiag+ is a tool that allows you to access each Süttron operating device using the Microsoft CE operating system via the network.

The user can view the content of the display and interact with the software running on the device, regardless of the software manufacturer. In this case, you can perform the same actions that you can when operating the touch screen directly. You can also use the keyboard of the accessing device - a PC or another operating device - to enter data without the need for an alternative routing via the input panel of the device that you are accessing.

Additional functional enhancement is provided by the option that allows you to transfer files to any folder in the device that can be written to.

As a result, you can use TSDiag+ to transfer updated project files or drivers from one computer to multiple operating devices or to check the current status of the application currently running.

TSDiag+ also allows you to update the operating system or the boot loader from a central location. You simply have to transfer the new images to the device and then import them using the existing tools.

3 Installation

3.1 Installing the Client on a PC

You do not have to carry out an installation in order to use the client on a PC. Simply copy the executable file `TSDiag+_Client_PC.exe` to a directory of your choice and start it from there. Since the program stores the connection data in a file, it is advantageous if all users that are working with TSDiag+ have write authorization for this directory. As of TSwIn .net version 4.10, the PC client is integrated into the interface and can be started from the menu (Tools - TSDiag+).

3.2 Installing the Software on an Operating Device

TSDiag+ is available for Süttron operating devices equipped with the XScale processor as well as the ARM9 processor. For this reason, it is important that you first select the correct program files for the device. The `Client_Terminal` folder contains two subfolders `ARM9` and `XScale`, in which the relevant program files are stored. You must first transfer these to the operating device. The directory in which the program files are saved is thus the target directory in which TSDiag+ must be installed. There are several different ways of transferring the files:

FTP Transfer:

All Süttron operating devices that use the Windows CE operating system are equipped with an integrated FTP server that you can use to transfer the files. For devices with ARM9 processors, the transferred files are stored on the Flash drive (`\FlashDrv\`). On XScale devices, the files are stored on the CompactFlash card (`\StorageCard\`) installed in the device.

Transfer Using an USB Stick:

If you use an USB stick as a transport medium, it is displayed as `\HardDisk\` on the operating device. From there, you can copy the program files to any directory in the device.

Using a CompactFlash Card (only for devices with XScale processors):

Similar to the approach used in the case of USB sticks, you can also use a CompactFlash card to transfer the files to the operating device.

After transferring the required files to the device, you can start the installation by launching the installer. The name of the installer is either

TSDiag+_Installer_XScale.exe or **TSDiag+_Installer_ARM9.exe**, depending on the type of device.

The installation process consists of two steps:

1. Confirming the license agreement.

The first dialog box contains the license agreement governing the use of the software manufactured by Süttron. To use the tool, you must accept this agreement. You can only go to the next dialog box when you have set the check mark.

2. Registering the Software.

In the second dialog box, you are asked for a registration key that will unlock the software for this device. If you have not yet been issued with a key for the device, you can operate the software in demo mode with a restricted range of functions. You can then enter the registration key at a later date, as described in the following section.

After you have executed the individual steps, you can start and use TSDiag+. If, for any reason, the changes made in the registry are lost, for example, if you manually delete the registry or execute an image update, you can restart the installer at any time. The settings specified in the meantime and the users created are saved in files in the installation directory and are thus retained if you perform a reinstallation.

3.3 Registering the Software

To enable the software to be unlocked at a later date, the **Settings** dialog box contains the **Registry** button. You can use this function to open another dialog box, which asks you to enter the license key. After you enter a valid license key, the software is unlocked and the **Registry** button is deactivated.

If the registration is lost, the button is automatically reactivated and you can then enter the code again. This is the case if the **settings.dat** file is deleted or manually changed.

3.4 Files and Registry Keys

This section lists all the files that are copied to the device during the installation or that are created on the device while it is being operated. It also lists all the registry keys required to ensure correct operation of the software.

3.4.1 Files for the PC

The following files are created on the PC during the installation.

Table 3-1 Files (PC)

File Name	Storage Location	Time Created
TSDiag+_Client_PC.exe	Any	Installation
TS-Diag+_Connections.dat	In the same folder as the client	During the first start

3.4.2 Registry Keys for the PC

The following registry keys are created during the installation:

- HKLM\Software\Suetron\RemoteDisplay\

3.4.3 Files for the Operating Device

The following files are installed for operating devices with XScale processors.

Table 3-2 Files (XScale)

File Name	Storage Location	Time Created
TSDiag+_Client_XScale.exe	Installation folder	Installation
TSDiag+_Connections.dat	Installation folder	First client start
TSDiag+_Server_XScale.exe	Installation folder	Installation
TS-Diag+_Server_Autoload_XScale.exe	Installation folder	Installation
TSDiag+_Log.log	Installation folder	First server start
TSDiag+.lnk (link to the server)	Installation folder	Installation
settings.dat	Installation folder	Installation
users.dat	Installation folder	Installation

The following files are installed for operating devices with ARM9 processors.

Table 3-3 Files (ARM9)

File Name	Storage Location	Time Created
TSDiag+_Client_ARM9.exe	Installation folder	Installation
TSDiag+_Connections.dat	Installation folder	First client start
TSDiag+_Server_ARM9.exe	Installation folder	Installation
TS-Diag+_Server_Autoload_ARM9.exe	Installation folder	Installation
TSDiag+_Log.log	Installation folder	First server start
TSDiag+.lnk (link to the server)	Installation folder	Installation
settings.dat	Installation folder	Installation
users.dat	Installation folder	Installation

3.4.4 Registry Keys for the Operating Device

The following registry key is created for operating devices with XScale processors.

Table 3-4 Registry entries (HKLM\Software\Suetron\RemoteDisplay)

Name of Value	Default Setting	Time Created
InstallPath	Installation folder	Installation

An additional entry that executes the auto loader every time the system is started is added under HKLM\CFLaunch\. The auto loader ensures that the shortcut is available on the desktop and starts the server if it is activated in the settings.

The following registry key is created for operating devices with ARM9 processors.

Table 3-5 Registry entries (HKLM\Software\Suetron\RemoteDisplay)

Name of Value	Default Setting	Time Created
InstallPath	Installation folder	Installation

An additional entry, which executes the auto loader every time the system is started, is added under HKLM\Init\. The auto loader ensures that the shortcut is available on the desktop and starts the server if it is activated in the settings.

All settings that can be adjusted in the TSDiag+ are saved in the file **settings.dat**. This file is encrypted and is protected by a check sum. Therefore, you should not edit the file manually. The users are stored in the file **users.dat**, which is also protected.

To enable you to use the same users on multiple operating devices without having to create them manually, you can copy the user file from one device to another. The users are then available the next time you restart the TSDiag+ server.

4 Server Functions

4.1 Starting the Server

Manual Start:

You can start the server at any time either by clicking on the desktop shortcut **TSDiag+** or by directly executing the corresponding server file from the installation directory.

Automatic Start:

The auto loader is started each time you start the system. On the one hand, this ensures that the desktop shortcut used for manual starting is available. On the other, the system checks whether the automatic startup of the server is activated in the settings.

4.2 The Main Dialog

To display the main dialog, click on the Süttron icon in the system tray (to the left, beside the clock). From here, you can modify the server settings, stop the server or disconnect an existing connection. The individual functions are described in more detail below.



Figure 4-1 The main dialog for the server

4.2.1 Exit

You can use this button to shut down the server completely. Any existing connection will be disconnected and the remote user receives an error message. You can restart the server at any time.

4.2.2 Hide

While the main dialog is displayed, you can see an entry in the task bar and a Süttron icon in the system tray. You can use the **Hide** button to close the dialog and the entry in the task bar disappears. Only the icon in the system tray, which allows you to restore the dialog, is retained.

4.2.3 Settings

This button brings you to a dialog in which you can adjust all the settings that influence the behavior of the server during operation. The individual sub-items are explained in more detail below.

4.2.3.1 Security Prompt

Before displaying the dialog for adjusting the settings, the system issues a security prompt. This asks you to enter the administrator password, that is, the password of the user **Admin** and is designed to secure the server against unauthorized manipulation.

This password is initially set as **123456** after the installation, but you should change it for security reasons.

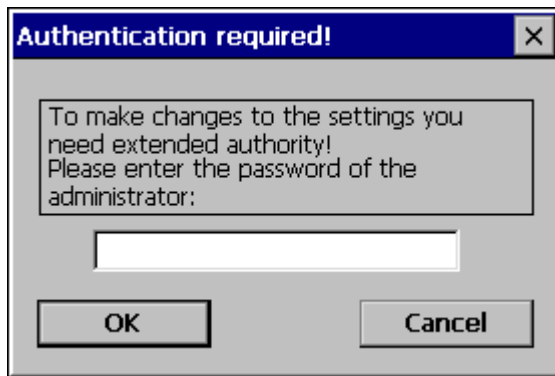


Figure 4-2 Authentication Required dialog

The **Settings** dialog is only displayed after the correct password has been entered.



Figure 4-3 Settings dialog

4.2.3.2 General Settings

In this dialog, you can adjust the basic operational data such as the startup, stop and update behavior as well as the password protection to suit your requirements.

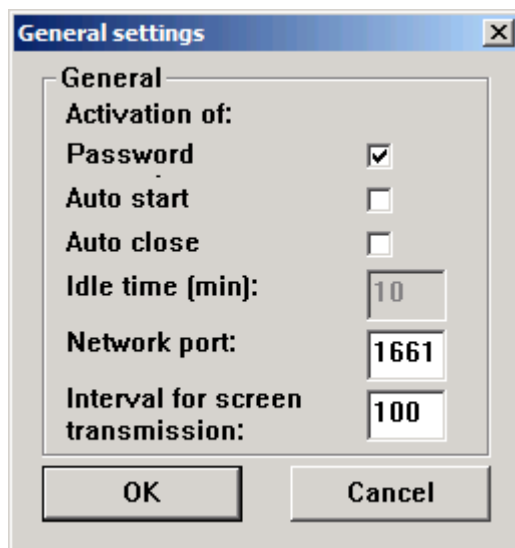


Figure 4-4 General Settings dialog

Activation of Password Protection:

To activate the password protection, mark this check box. For security reasons, control commands from the client will not be accepted if the password protection is deactivated! You can then only view the screen of the operating device. However, you should always activate password protection to prevent unauthorized access.

Activation of Auto Start:

If you activate this option, the auto loader automatically starts the server when the system is started.

Activation of Auto Exit:

This option enables the server to be stopped automatically in order to save resources after it has run for a specific length of time without an existing connection. Users that are currently active in the Settings dialog are also counted as existing connections. This prevents the software from being shut down during administration.

Idle Time (min):

Here, you can enter a time in minutes after which the server shuts down itself. The input field is only active if the **Auto Close** option is activated.

Network Port:

Enter the communication port which should be used to set-up the connection. In case of a firewall in the network you have to set this port free for communication.

The port number entered in this dialog must also be set as the destination address for the client.



For file transmission the next higher port is used, thus this port has to be set free in the firewall, too!
Due to this the highest possible port number is 65534.

Interval for Screen Transmission:

Here, you enter the minimum time in milliseconds that the server must wait between two screen transmissions. If you set the value too high, this can lead to long screen build-up times, while a value that is too low can place an excessive load on the pro-

cessor in the device, which may also have an effect on other applications. The lowest possible value is 50 ms, however the default value of 100 ms is perfectly adequate to ensure smooth operation.

4.2.3.3 User Management

The User Management function allows you to create and delete users or adjust the settings and passwords.

User names and passwords are subject to the following restrictions:

- User names = maximum of 15 characters
- Passwords = maximum of 30 characters



Figure 4-5 Main menu of User Management

Change Password:

Opens a dialog that allows you to change the passwords for all the users created on the device. Since only administrators are supposed to be able to access this area, the system does not issue a query for the old password. To change a password, you only have to select a user and enter the new password twice. For security reasons, a password must contain a minimum of six characters.

Set up User:

To set up a new user, you only have to specify a user name that has not already been used and then enter the desired password twice. To ensure that the new user is issued with an operating authorization, you must also activate the relevant option in the dialog. After you click on the **Set up** button, the system checks the data and saves the user.

Delete User:

In this dialog, you can select and then permanently delete a user from a list of all existing users. The **Admin** user is not listed here because the Admin user is required to operate the server.

Change User:

If you subsequently want to issue or withdraw operating authorization to or from a user, you can select the desired user from a drop-down list in this dialog. The dialog is automatically filled in accordance with the current settings when you change your selection. If you mark the check box or remove the check mark, the user selection is deactivated until you save or reject the change. Choose either the **OK** or **Cancel** button to exit the dialog, where **OK** will save the last unsaved change and **Cancel** rejects it.

4.2.3.4 Log File Settings

In the dialog that opens after you activate this button, you can adjust the settings and operations that refer to the log file for the server.

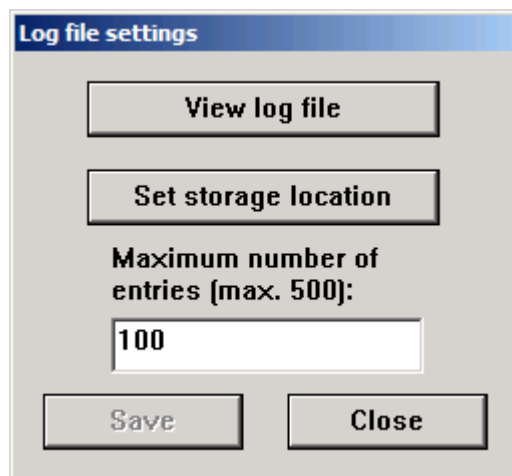


Figure 4-6 Log File Settings dialog

The individual functions are:

View Logging File:

You can use this button to open a window that displays the content of the log file. You can not edit the content. Depending on the size of the file, it may take several seconds to open.

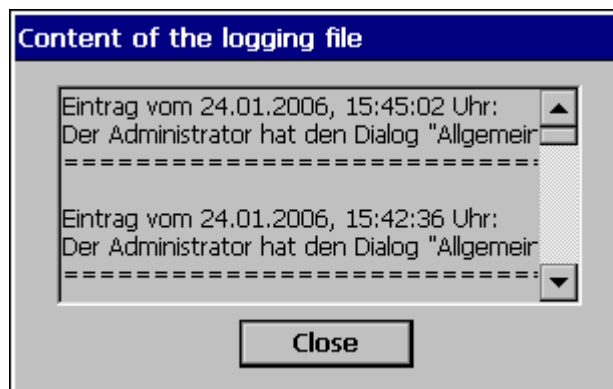


Figure 4-7 Window for displaying the log file

Set Storage Location:

After the installation, the log file is first stored in the installation folder. To change this, you can specify a different directory in this dialog. After you confirm with **OK**, the system first checks whether files can be created in the specified folder. If so, the content of the old log file is copied to the new location to prevent any data from being lost.

If you want to save the log file to another computer in the network, you must ensure that a folder exists and that it is released on this computer. You can access it from the command prompt. To do this, use the following command:

```
net use Networkpath_to_directory virtual_name
```

The content of the directory then occurs at **network\virtual_name** in the folder structure of the operating device. You can then specify this name as a path for the log file.

Maximum Number of Entries:

Here, you can set the maximum number of log entries to be stored in the file. The number of entries that you should specify depends on the remote access frequency, the change to the settings as well as on the amount of memory available for the file.

The log file logs actions in conjunction with the server.

These actions are:

- Starting the program
- Exiting the program
- Successful login (with user name and IP address)
- Unsuccessful login (with user name and IP address)
- Logins prevented from the operating device
- Logging out
- Disconnecting the connection from the operating device
- Accessing the Settings dialog
- Unsuccessful attempt to access the Settings dialog
- Exiting the Settings dialog
- Creating a new user
- Deleting a user
- Changing the user authorizations
- Password changes for the users
- Changing the storage location of the log file

4.2.3.5 Registry

You can use this button to reach the dialog (described in the previous section) in which you can retroactively register the server. Bear in mind that this button is only activated for as long as the server remains unregistered. Once you have successfully registered the server, the button is deactivated.

4.3 Setting up a Connection

Provided that the server is running on the device, you can also set up a connection to the device. No interaction on the server side is required to set up the connection.

However, another information window that enables an operator working on the device to prevent remote access is displayed before the first transfer of screen contents. This information window closes automatically after a maximum of ten seconds and the connection is released.

If a user prevents access, a message is sent to the accessing client and the connection is broken. In this case, the server waits for other incoming connections.

A maximum of 8 clients can be connected to a server simultaneously. Additional connection requests are rejected.

4.4 General Operating Conditions

The software is executable on devices with XScale processors (Windows CE 4.2 operating system) and ARM9 processors (with Windows CE 5.0). The client is also available for PCs using the x86 architecture.

To enable communication between client and server to be established, the server and the client must be in the same subnet within the network.

The amount of memory required on the operating devices is very low - the server and client have a combined memory requirement of less than 120 KB. Added to this is the memory required by the log file. However, its size is determined by the settings. The client for the PC requires less than 50 KB on the hard disk and is therefore of negligible size by today's PC standards.

5 Client Functions

5.1 Setting up a Connection

Depending on the server settings, you can set up a connection in only a few steps, as described below.

5.1.1 Selecting the Destination Computer

After you launch the client software, a dialog asking you to enter the computer name or the IP address is displayed. If a connection to the desired device was set up previously, you can select the data from a drop-down list. In this case, the entries in the list are sorted chronologically so that the last connection established appears at the top.

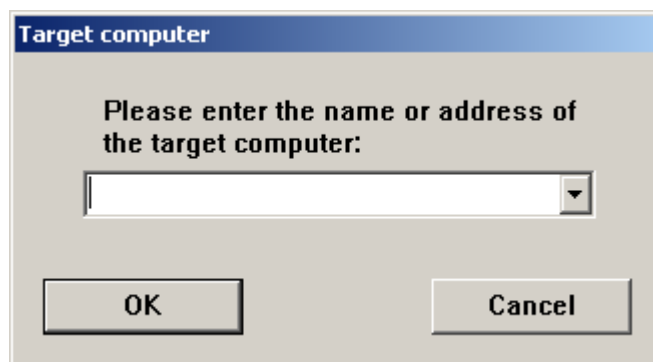


Figure 5-1 Dialog for selecting the destination computer

After you click on the **OK** button or confirm with Enter, the system tries to establish a connection to the device. An information window is displayed while the connection is being set up.

After a connection has successfully been established, the system displays either the password protection dialog or the main screen displaying the screen contents of the device.

If a connection can not be established, an error message to this effect appears and the client operation is terminated.

5.1.2 Password Request

Provided that the password protection is activated on the server, the system displays the dialog **Password Request**, which requests that you enter a valid combination of user name and password for this device.

If the client settings already contain a default user name, it is automatically entered into the **User Name** input field and the cursor moves to the **Password** input field.

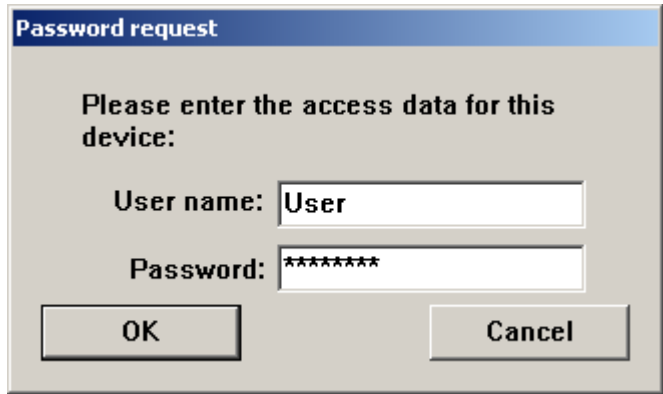


Figure 5-2 Password Request dialog

After you confirm your entries, the password is encrypted and transmitted together with the user name to the server. The server analyzes the entries and, if the name and password are correct, starts to transfer the screen contents.

If the user name and/or the password entered is incorrect, the server sends an error identifier to the clients. The server issues an error message and then stops.

5.2 The Main Screen

The primary function of the main screen is to display the screen contents of the operating device.

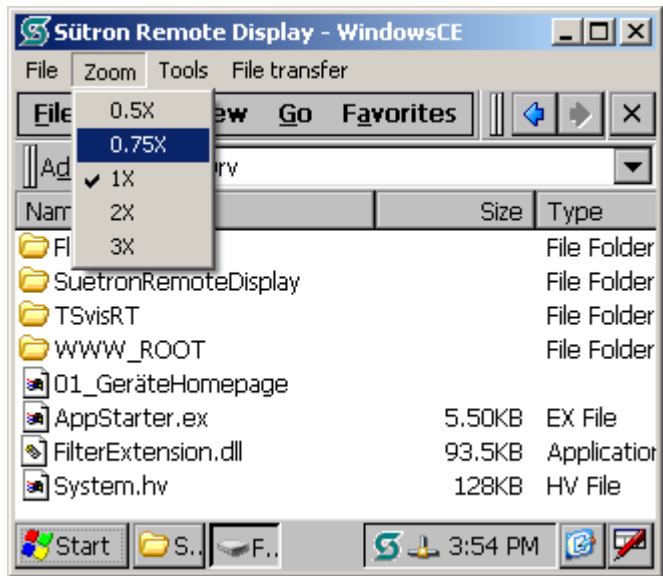


Figure 5-3 The main screen on the client, PC version

In the version for the operating devices, the main screen contains scrollbars so that devices with a relatively high resolution can also be controlled from small operating devices.

Since the PCs generally have a higher resolution than the operating devices, the scrollbars were omitted from the PC variant of the client.

The size of the main screen adjusts to the resolution of the device to be controlled, taking the zoom factor into account. In the operating device clients, the maximum size of the main screen is 80% of the display size.

5.2.1 File - Settings

This dialog allows you to save a range of client settings. These include the **zoom factor** after the software starts, as well as the **size** and **position** of the main screen.

Only those values whose check boxes are marked are saved. All other values remain unchanged. To delete a previously saved value, mark the **Default Value** check box.

You can also save a **default user name** that is automatically entered into the user name field in the **Password Request** dialog.

5.2.2 Zoom Factor

The zoom factor allows you to enlarge the display of the screen contents of smaller operating devices, or reduce the size of screen contents from large devices.

The possible zoom factors are:

- 0.5x,
- 0.75x,
- 1x,
- 2x and
- 3x.

The size of the window is adjusted automatically when you change the setting.

5.2.3 Tools

This menu provides additional functions that will considerably simplify your work with TSDiag+ and the Süttron operating devices. These functions are:

Restart TSvisRT:

This function allows you to restart the TSvisRT runtime environment. You need to do this when you transfer new drivers or application data because they can only be detected and imported after you carry out a restart.

Quit TSvisRT:

If you exit TSvisRT, it is automatically restarted within a few seconds. This function enables you to exit TSvisRT permanently, that is, until the next time you restart the device or until you start the TSvisLD_CE.exe loader program manually.

Restart Device:

This function triggers a complete restart of the operating device. This is particularly useful after you update the boot loader or the operating system image, to ensure that the changes take effect.



If you restart the operating device, this can affect other devices and machines that are communicating with it. Before carrying out a restart, you should therefore make sure that it will not result in any undesired secondary effects!

5.2.4 File Transfer

You can use the **File Transfer** menu item to transfer files from the client to the server.

A dialog opens, in which you can select the file that you want to transfer. The system then transmits the file name and the size of the file to the server. The server, in turn, opens a window in which you can choose the directory for the file.



Since this window is also transmitted via the remote connection, there may be a slight delay before it is displayed. In the case of small operating devices, you may find that the **OK** and **Cancel** buttons in the selection dialogs are not visible because they are output outside the displayable area. In this case, you can use the following keyboard controls: **Enter** is equivalent to the **OK** button, **Escape** has the same effect as clicking on the **Cancel** button.

After you select the target directory, the system checks whether enough memory is available and then starts the transfer. The transfer progress is displayed in a separate window. While the file transfer is taking place, no commands are sent from the client to the server and the screen contents are transmitted much less frequently. This ensures that the file transfer is faster and more stable.

After the transfer is completed, the progress window closes and the transfer intervals are set to their normal values again.

5.3 Operation Enabled

The main screen displays a small window that indicates whether you can (screen contents green) or can not (screen contents red) currently transmit control commands to the server.

As soon as several clients have logged on to the server, but operation can only be carried out from one location, only one user at a time will receive the enable signal.

If the client that is currently enabled does not execute an operation for a longer period of time (approx. 15 seconds), the other clients are notified that operation is possible again. The first client to transmit a command to the server is then enabled.

5.4 Canceling a Connection

To cancel the connection from the client, you only have to close the main screen. Before the application is shut down, it transmits some commands to the server to enable the server to detect the termination of the connection more quickly.

If the connection is canceled from the server, or is interrupted as a result of a connection termination, an error message is issued and the application is then closed.

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