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Air Tube Transport Systems

Product Documentation

U08 R-Tube User Manual

Hortig-ID : Hörtig-U08
Document Version: 1.05
Document Status: Release

Author: S.Grießhammer
Document Date: 12.10.2015
Latest update: 17.01.2019

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1. Abstract

1.1. Purpose of this Document

The purpose of this document is to describe all essential information for the user step-by-step to make full use of Air Tube System functions, capabilities, and procedures with the R-Tube 3 software.

1.2. History

Date	Version	Revision Author(s)	Revision Notes
16.10.2015	0.01	Gh	
22.10.2015	0.02	Gh	
25.07.2016	1.03	Gh	R-Tube 3.10
15.01.2019	1.05	Gh	R-Tube 3.21

1.3. Document References

Ref.	Document Name	Version	
[1]	Hörtig-E40 „Programmer“		E40_ProgF151_EN.pdf
[2]	Hörtig-I08 „R-Tube Installation“		I08 R-Tube Installation Manual 101.pdf

1.4. Abbreviation

CC	Central Control Unit
MTBF	Mean Time Between Failures
DCS	Distributed Control System

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2. Before you start

Thank you for choosing R-Tube for Windows. We are continuously extending and enhancing this software.
R-Tube3 is designed to monitor HÖRTIG rohrpost systems "H61F".

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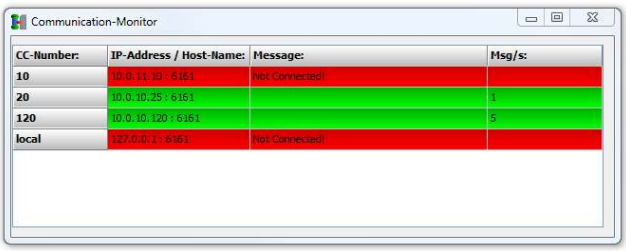
3. Getting started with R-Tube 3 software, Starting the R-Tube 3 software

3.1. Starting Main Program

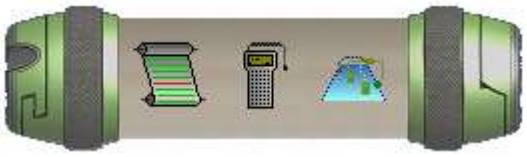
Start R-Tube by double-click on the R-Tube Icon.

R-Tube 3 main-application will start and show a carrier on the screen:

When booting R-Tube as a host the Communication-Monitor will pop up until all connections to the CCs are established. If all connections are ok, Communication-Monitor will close automatically.



After boot-procedure is completed, R-Tube Control Panel will be displayed on the screen which will provide several applications to see system-state, maintain system, see and analyze recorded data:



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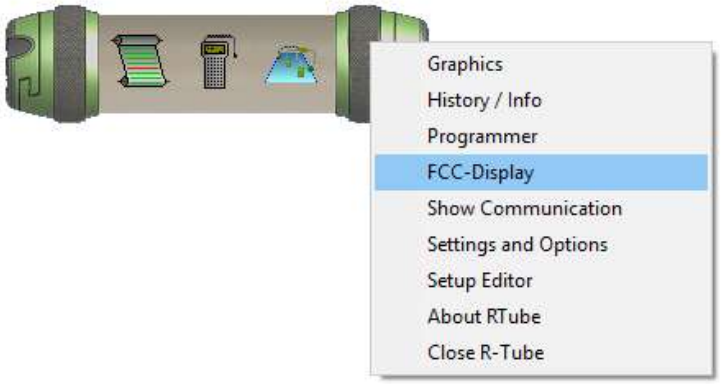
3.2. Starting the Applications

3.2.1. Start-Options

The R-Tube applications can be started by a click on the according icon (only History, Programmer and Graphics). Or by using a hotkey (see 5.2.). Or by using the popup-menu.
To use the popup-menu do a right-click on the carrier (not on the symbols) and select the requested application / function.



3.2.2. Starting the History- / Info-Screen

To start the History-Viewer click on or use other start-option (see 3.2.1):

This application displays the transport-history and the state of zones and devices.
Size of display-elements, columns and lines can be changed by dragging with mouse.
Columns of transport-list can be resized or switched on and off in column-settings-menu.

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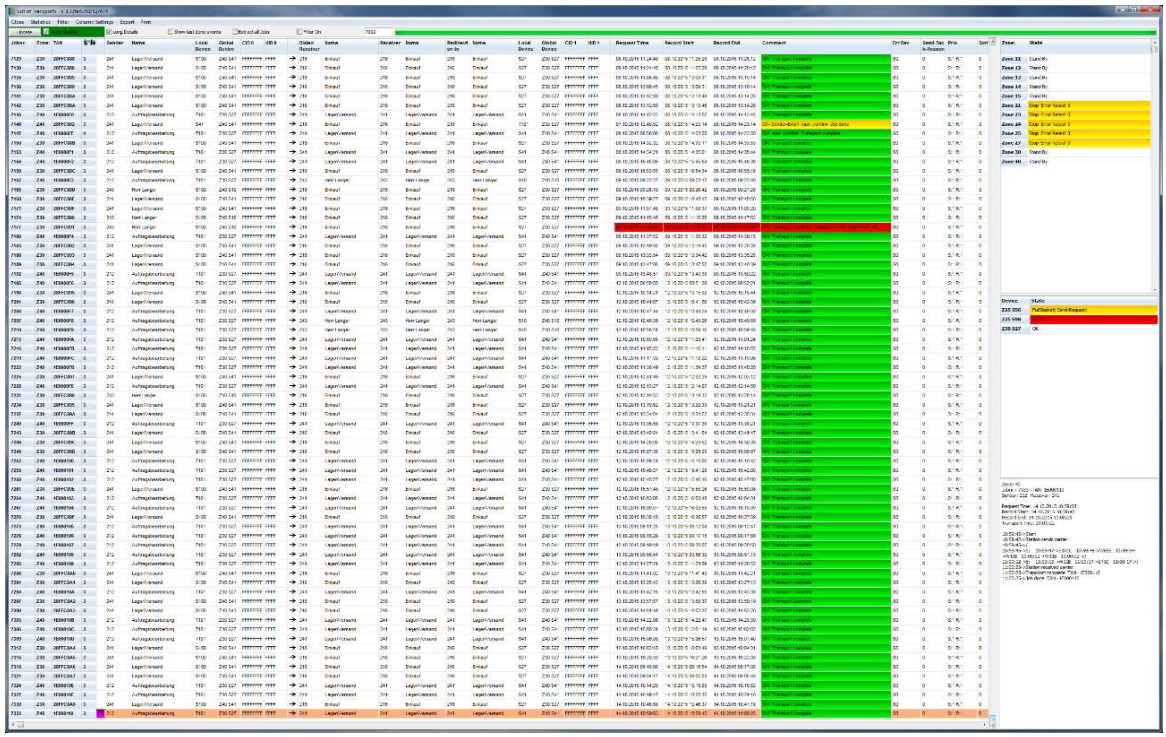

3.2.3. Starting the Programmer

To start emulation of the handheld Programmer click on:

Or use the popup-menu (see 3.2.1).
The "Programmer" provides access to CCs as the handheld programmer does.
Refer to “Hörtig-E40 Programmer“[1] for more details of programmer usage.

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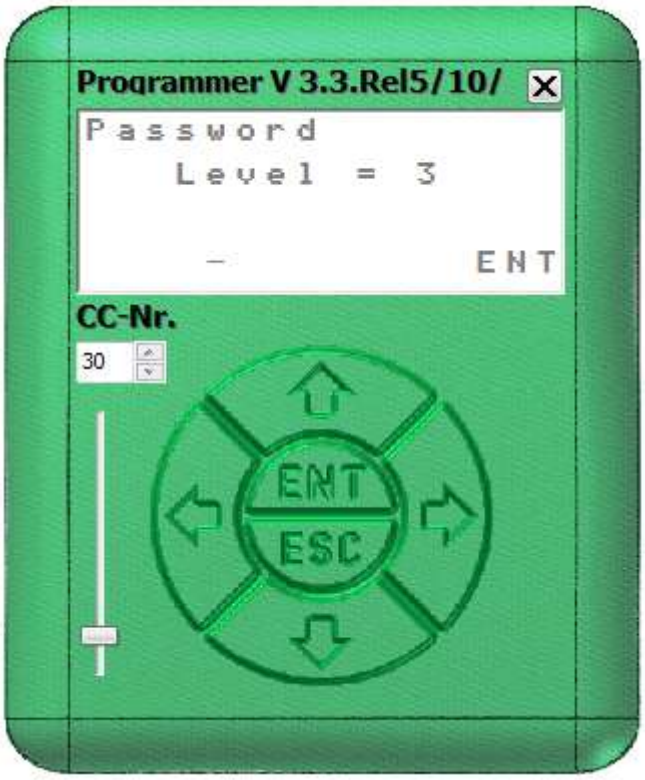

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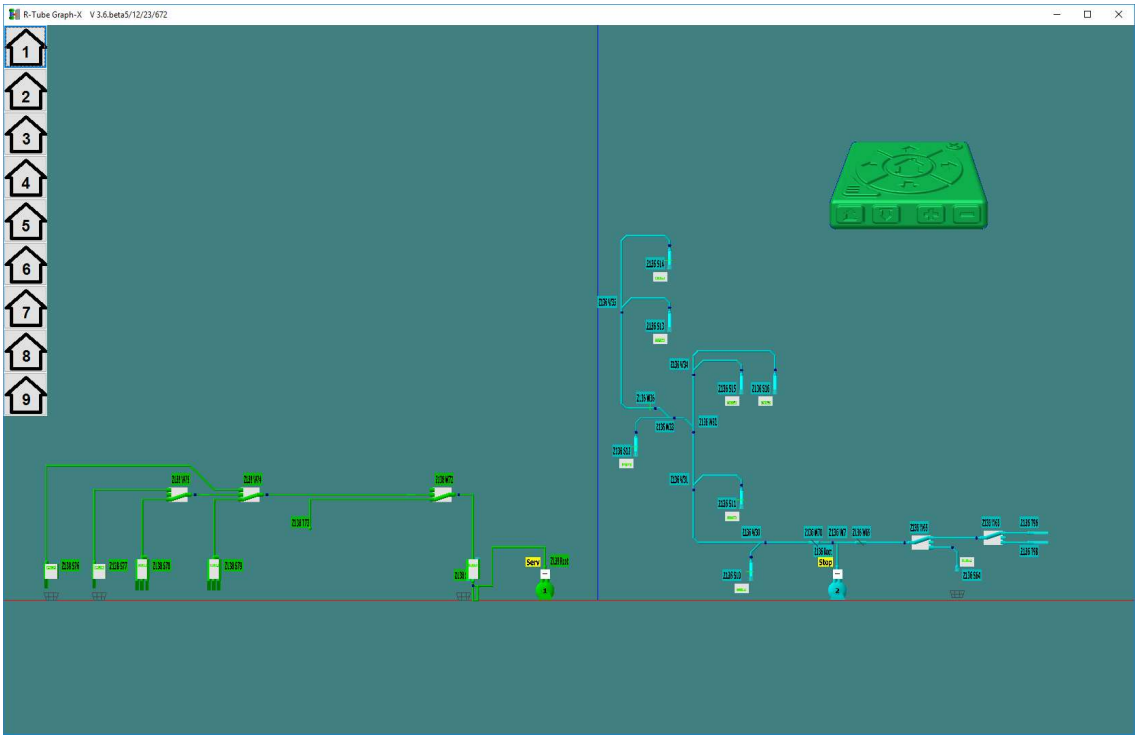
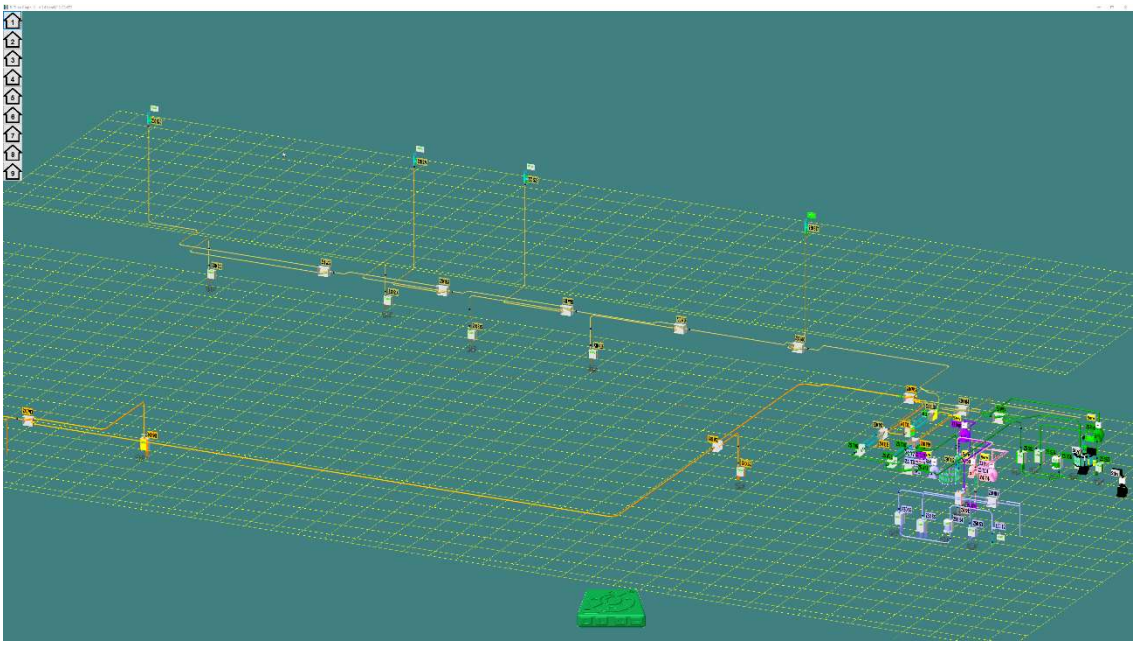
3.2.4. Start the Graphics

To start the System-Graphics click on:

Or use the popup-menu (see 3.2.1).
The Graphics Application allows a 2D- or 3D- view on actual state of the system.





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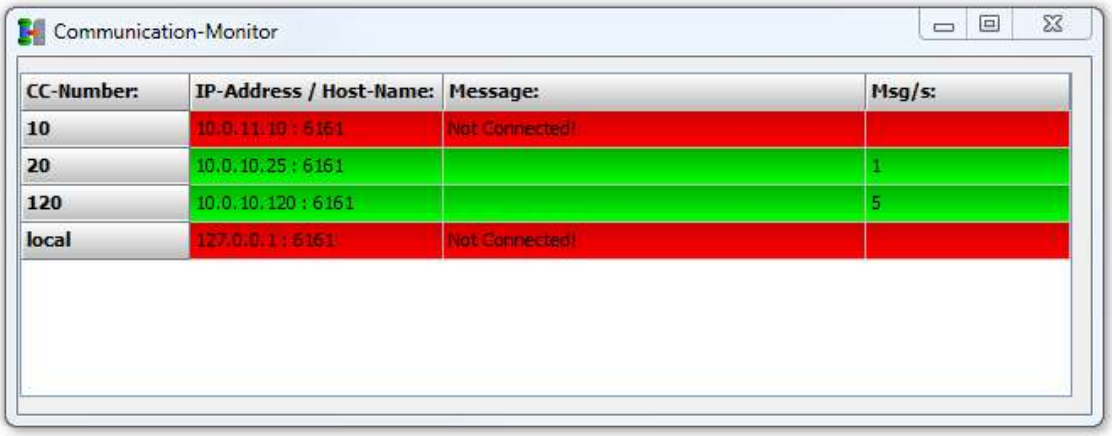
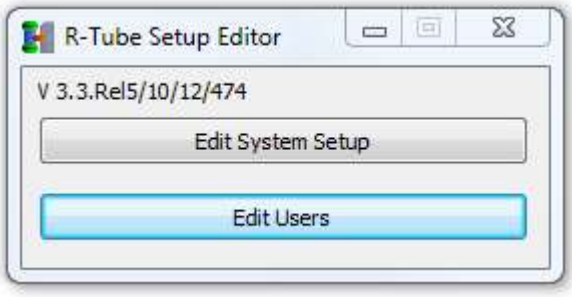
3.2.5. Showing Communication

To open "Show Communication" use the popup-menu (see 3.2.1).
The communication window shows a list of all available CC-connections, IP-addresses and ports.
Message-column will report the last status-message of this connection. Errors are displayed in red.
Msg/s reports the number of message frames received from CC per second.



3.2.6. Starting the Setup Editor

To start Setup Editor use the popup-Menu (see 3.2.1).
In Setup editor Setup-settings downloaded from CC can be displayed.
3D- Graphics and User-Names can be modified.



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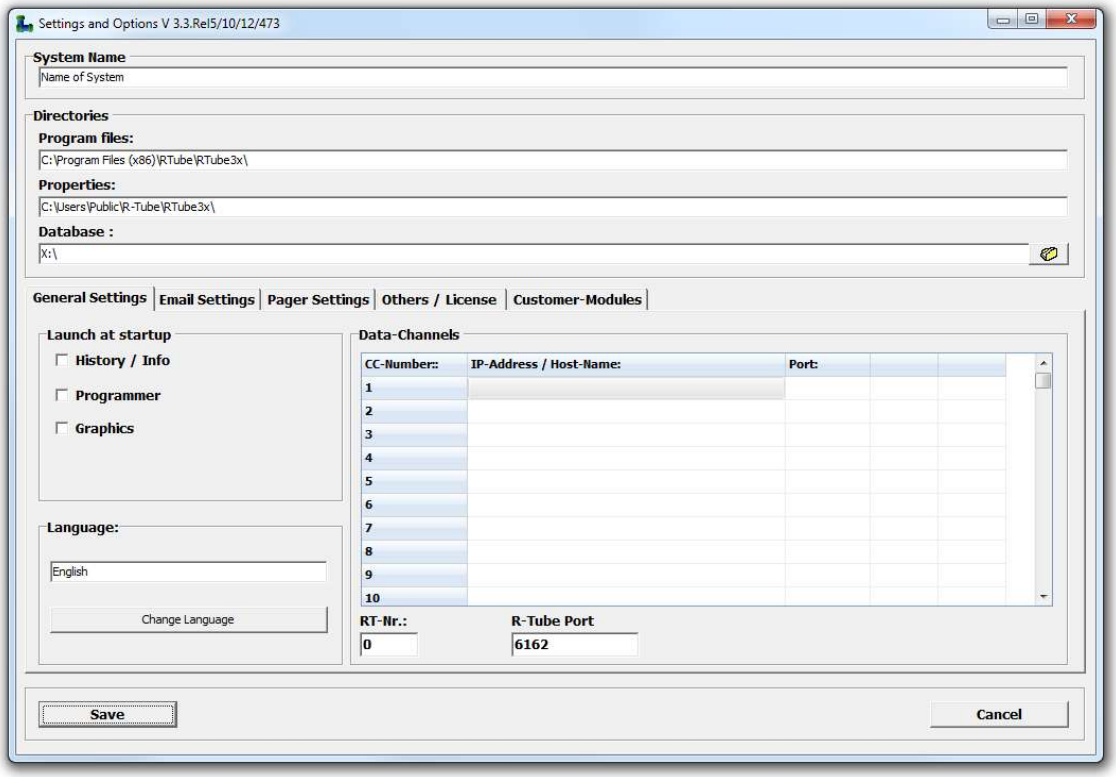
3.2.7. Opening R-Tube Settings and Options

To open "Settings and Options" use the popup -menu.
In "Settings and Options" the basic settings of R-Tube can be adjusted and modified.
See R-Tube Installation Manual for further details.



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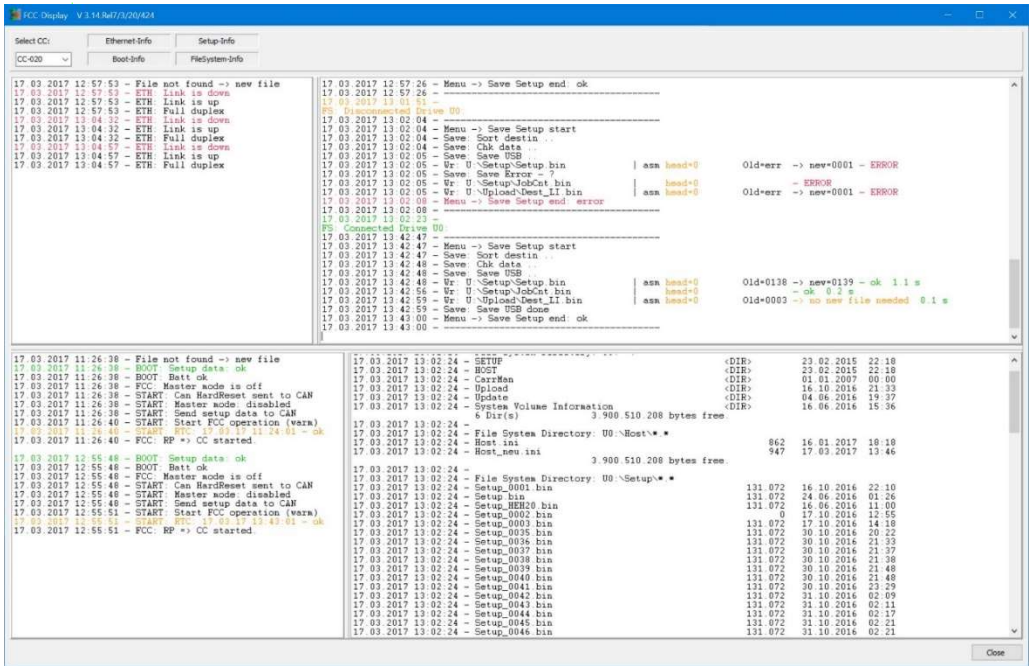
3.2.8. FCC-Display

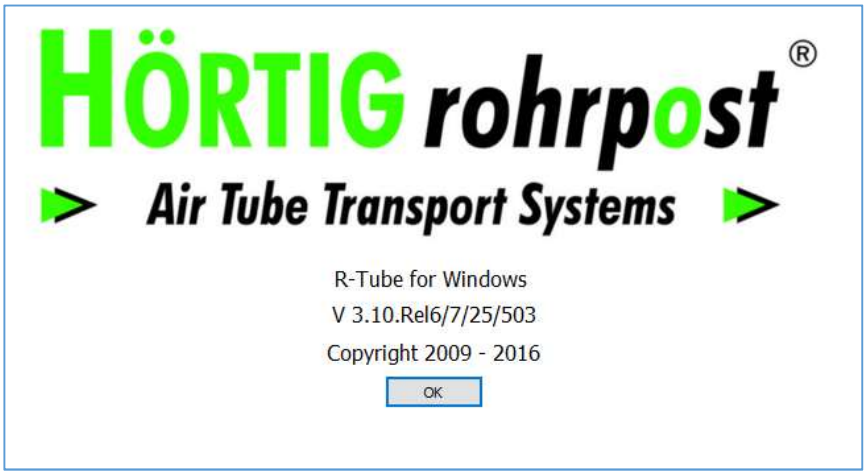
Use “FCC-Display” from the popup-menu to start the “FCC-Display”.



This application shows information provided from the FCC-Controler regarding state of network connection, boot-procedure, saving setup and the file-system of FCC.

3.2.9. About RTube

Use "About RTube" from popup-menu to see Version and Copyright of *R-Tube for Windows*.



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3.2.10. Automatically started Applications

There are several small Application which are started automatically by R-Tube:

- File-Manager
  See 4.5.
- Relauncher
  See 4.6.
- Applications for Customer-Modules.
  e.g. “SchoenoxIF.exe”

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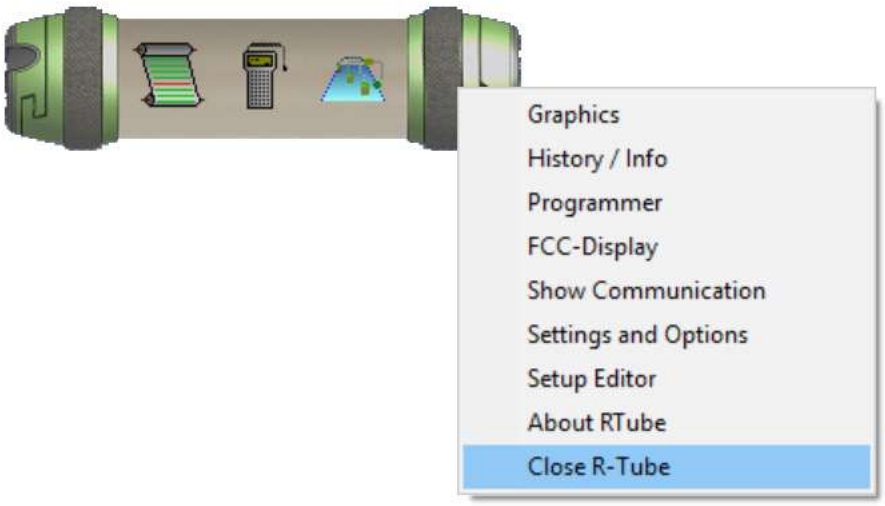
3.3. Shutting down *R-Tube for Windows*

To shut down R-Tube Main Program use "Close R-Tube" from popup-Menu:



All applications started by R-Tube Main Program will shut down automatically.

WARNING:
Do not shut down Windows without shutting down R-Tube before!
This could cause data loss!

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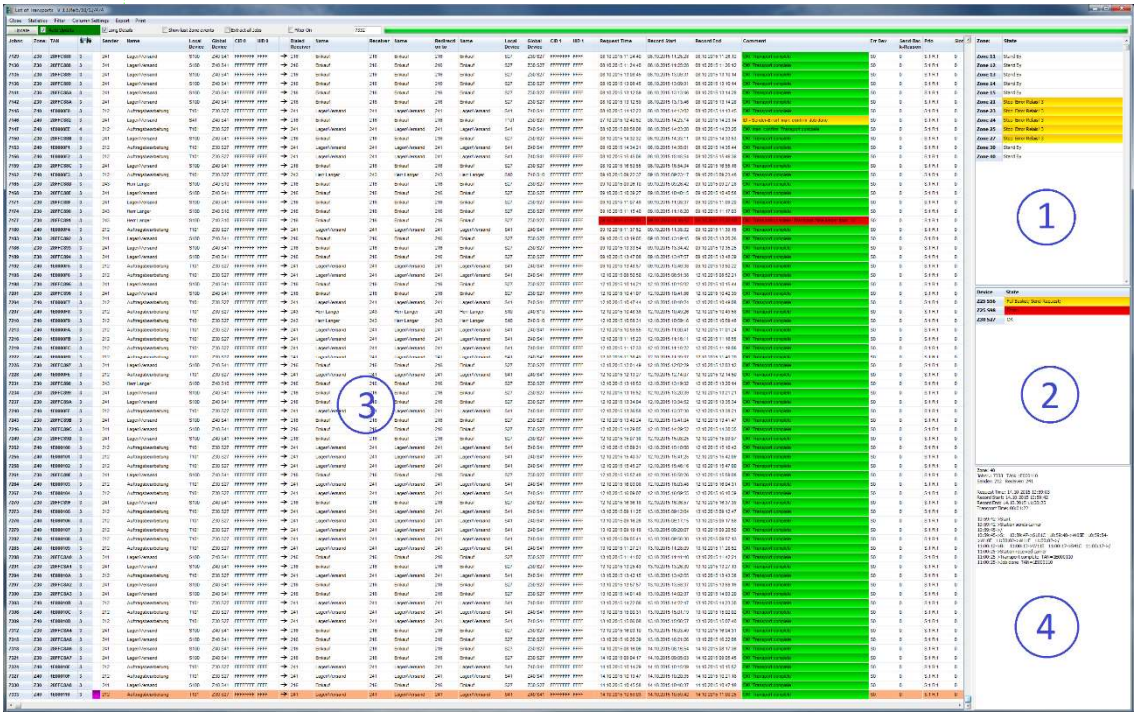
4. The *R-Tube for Windows* Applications

4.1. History- / Info- Screen



The history application shows all recorded jobs (3), current zone-state(1), device- state (2) and events (4).

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4.1.1. The Zone State

Zone:	State	Error Relais:
Zone 1	Stand By	
Zone 51	Run	
Zone 54	Stand By	
Zone 70	STOP on Alarm!	Zone off
Zone 111	Stand By	
Zone 112	Stand By	
Zone 113	Stand By	
Zone 114	Service	
Zone 115	Stand By	
Zone 118	Stand By	
Zone 119	Stand By	
Zone 131	Stand By	Device-Error - Err#28
Zone 132	Stand By	Device-Error - Err#28
Zone 136	Stop	Device-Error - Err#28

This list shows the zones connected to R-Tube, the state of each zone and if an error-relay is on. 1st column contains number of zone. 2nd column shows the state of zones. And last column gives an information if an error-relay is on.

2nd column:
Colours change according to the state of zone.
The following states may appear:

State:	**Colour:**
Standby	White
Run	Green
Stop	Yellow
Service	Yellow
STOP on ERROR/Alarm	Red
Freeze	Light Blue (Aqua)
Solver	Yellow

3rd column:
If a device reports an error-state a text (“Device-Error”) will be diplayed and colour changes to yellow.
If a zone shuts down there will be a Text: “STOP on Error” or “STOP on Alarm”. Colour changes to red.

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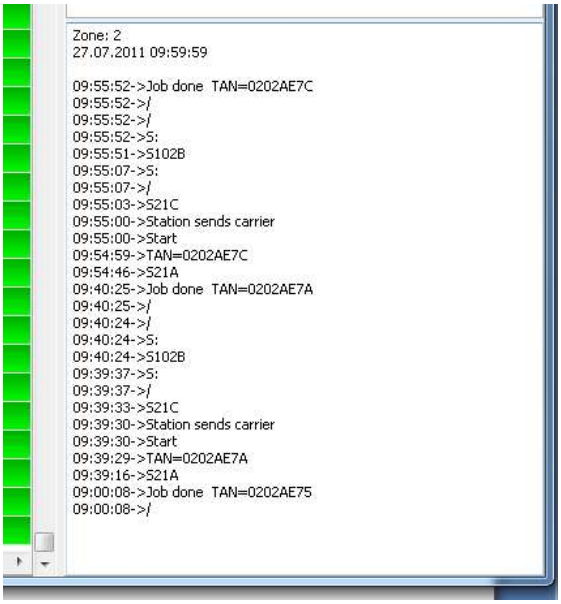
The System-Error-Code reported from CC is added to the Text. For further information see “Hörtig-E40 Programmer“[1] – chapter “System – Error Codes”.
If several zones are controled by one central controler all zones of this controller will show same error-relay-info (in screen-shot above: Zone 131, 132 and 136).
Since H61F-FCC V1.60 or higher there is an information about the alarm-number which stopped a zone. R-Tube V3.21 will show this number by adding “Alarm#” plus the alarm-number:

1st column:
By clicking on a line of the zone-display the event-display will change and show the last events of this zone.



The last events are shown in chronological order independent from the recordings in the Transport-List.

Return to standard mode by removing the tick from “Show last Zone Events”.

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4.1.2. The Device Status

Device	State
Z5 S51	Full Basket;
Z5 S56	Receiving; Send-Request;
Z5GB	Blow; Speed; 0;
Z13 S2	Receiving; busy;
Z13GB	Speed; 0; Motor-Off-Delay;

The device status list displays all devices which have a non-standard state. A device could have more than one status.
Normal operating statuses are displayed white. „Reception full“ will change color to yellow. Errors are displayed red.

The list below describes the different types of device status that may occur:

Carrier in Send-Slot	=	A carrier was inserted into station but there is no Send-request yet. (No send-button pushed.)
Send-Request	=	A carrier is waiting for departure.
Full Basket	=	Station could not receive any further carriers.
Receiving	=	Station is waiting for arrival of a carrier.
Busy	=	Station is not in ist default-position. (A motor has been moved.)
Error	=	Device reports an Error.
No Communication	=	Device does not communicate with CC

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Blower-Statuses (GB):

speed:0	=	Blower on slow speed
speed:1	=	Blower on high speed
blow	=	Blower is blowing
suck	=	Blower is sucking
Air-Diverter moves	=	Air-Diverter is changing position
Motor-Off delay	=	Blower-motor is still running. Air-Diverter is at neutral-position.

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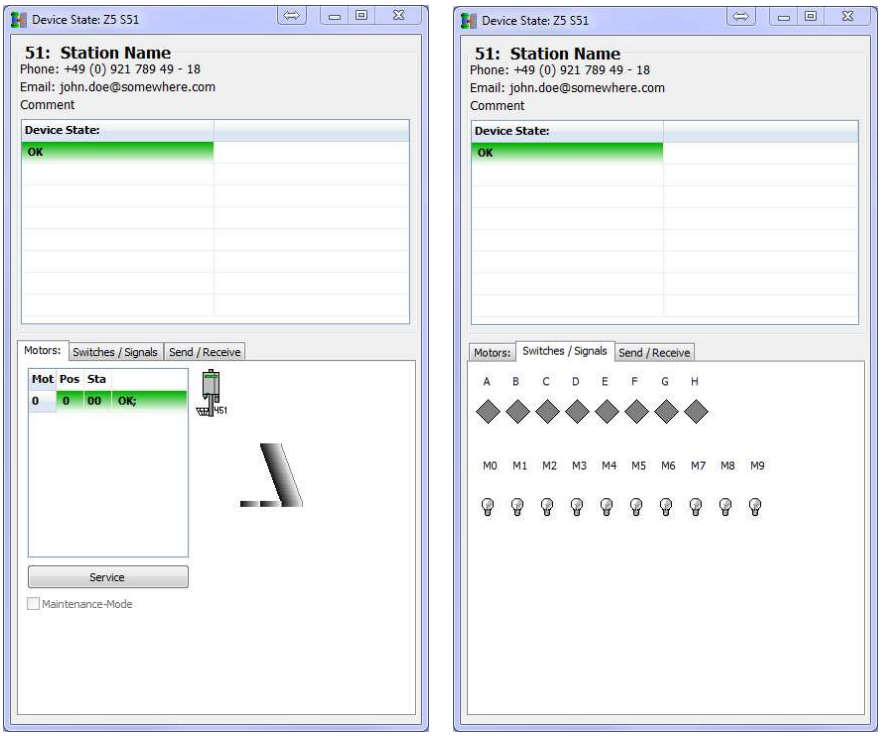
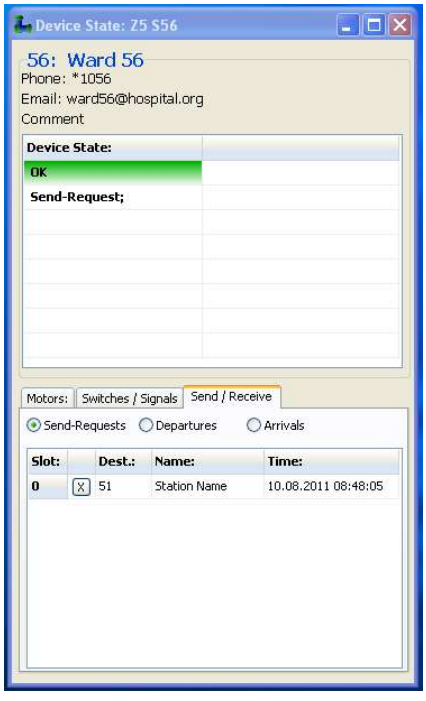
4.1.2.1. The Device Status – Detail Window

A click on a line in Device-Status-List will open a window with detailed information of the according device.



Note:
This function is not available if there is no setup-data stored on the PC. The setup-data must contain all existing devices at least.



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Beside the list of device-statuses there is more information available regarding motor-positions, Tube-Switches, Arrival-Signals. A list of send-requests, last destinations or last arrivals is available, too.
Station name, Phone number, Email address and comment are taken from the user list of R-Tube-Setup.

A click on the "Service"-Button will open the "Device Service" Window.

STOP Zone after Job:
This button will stop the zone of this device when current job is over.

STOP Zone NOW!
This will stop the zone of the selected device immediately.
WARNING: By stopping the zone during a transport it could happen that a carrier is still in the system. The user will have to remove the carrier manually and send it to default station.

Start Zone:
This will set zone of device to stand-by.

Start Purge:
This will start a purge-routine from selected device to get carriers out of system.

Auto Test:
This will start an automatic test of the selected device. If possible, all motors will move.

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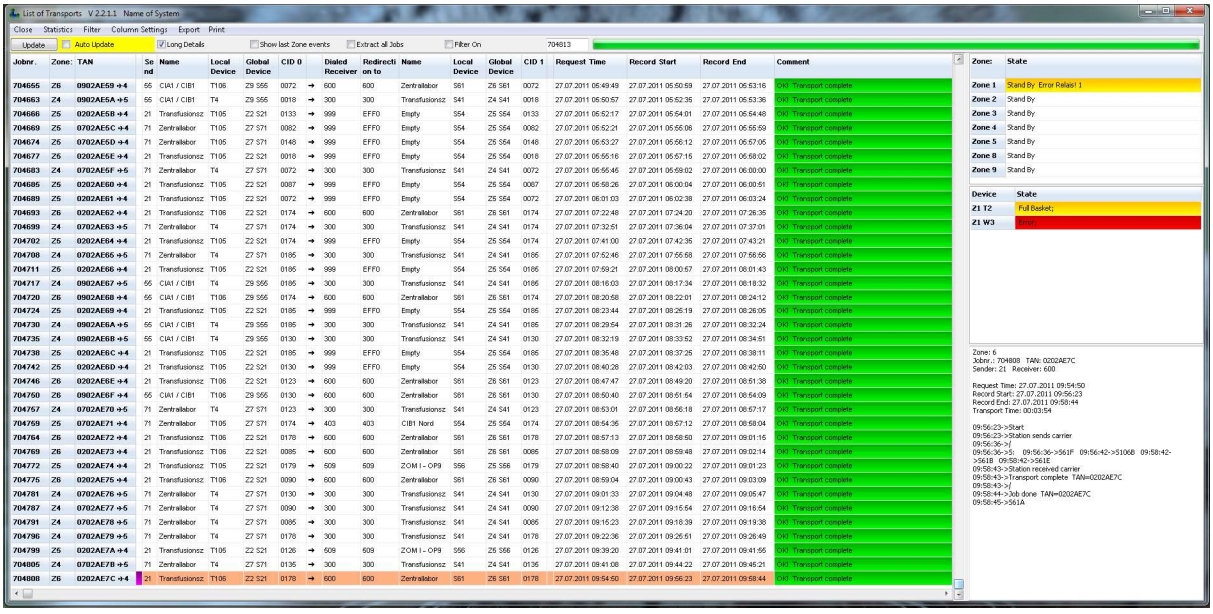
4.1.3. Transport- Lists- Viewer

4.1.3.1. General usage of Transport-List

The Transport- Lists- Viewer shows all recorded transports – actual ones (still in system) and completed ones. If a carrier is transported across several zones each job in a zone will create a new line. Prior lines who belong to this transport are minimized (except an error occurs). The status of each job is displayed in “Comment”-Column. Colors will change according to the comments in this column.



Examples:

Comment:	Colour:	Explanation:
Send-Request	white	a Send-Request was registered in Central Control
Send-Request Canceled!	white	Send-Request was canceled before departure. (Carrier was removed from Station)
OK!	Light blue	No error-message during this job.
Transport complete	green	Carrier has left the system.
Job done	light green	Part of transport finished in this zone. Carrier is still in system, waiting for next step. (Waiting in Transfer.)

Error-Messages are coloured according to their significance from yellow to red.

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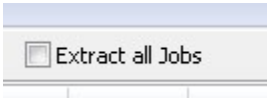
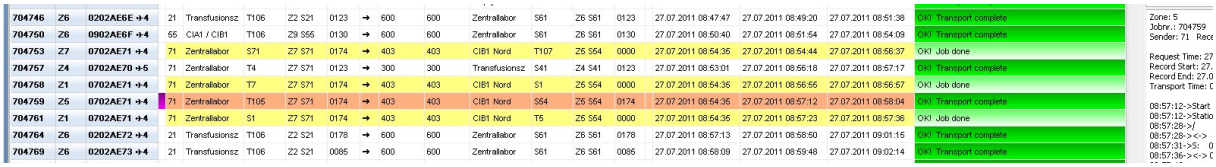
If a transport creates a new line in the list (a new job has started) prior lines of this transport are minimized. It is possible to extract all transports or only one transport.

4.1.3.2. Extract all transports:

To extract all transports select „Extract all Jobs“.



Extract a single Transport:
A single Transport is extracted by a right click on the list.
All rows who belong to the transport are marked yellow. The final job (carrier left system) is marked orange. Only rows with same TAN as selected row (magenta) are marked.



4.1.3.3. Meaning of columns:

Jobnr.	Sequential Job-counter
Zone	Zone of this job.
TAN	TransActionNumber of this transport and number of jobs Done during this transport
Sender	Destination-Code of sender
Name	Name of a Sender- / Destination-Code
CID 0 / 1	ID of the transported carrier
UID 0 / 1	ID of user who sent or received carrier
Dialed receiver	This Destination was dialed by user
Mapped Destination	The dialed destination is mapped to this destination. (e.g. “EFF1” which is a fixed destination is mapped to a standard destination 1234.)
Destination	Destination of this transport
Redirection	System delivered carrier here
Local Device	Device-Number of sender / receiver in local zone.
Global Device	Zone- and Device-Number of origin and final destination
Request Time	At this time user inserted carrier in sending-station
Start Time	At this time system started to handle this job
End Time	Time when job / Transport is done.

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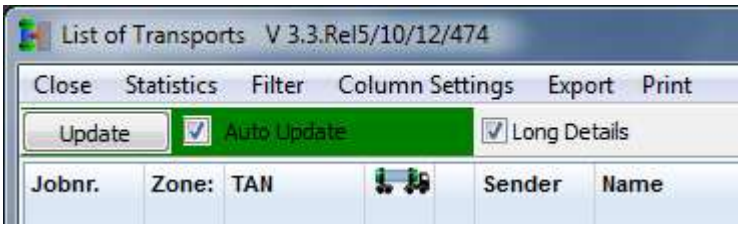
4.1.3.4. Pull-Down-Menu overview



There are several options in the pull-down menu available:
These options are described in the following paragraphs.

4.1.3.5. Close:

This will close the Transport-lists-Viewer. Main-Application will still run.

4.1.3.6. Print:

Sends a screenshot to printer.

4.1.3.7. Export:

This will export the actual list of jobs to an Excel- or CSV- file.
Note: The Excel-Export will export max. 65535 rows.

4.1.3.8. Column Settings:

This will open a list of all columns available. Select in “Show Column” the columns to be displayed in the transport-viewer. “Column Width” will adjust width of according column. Except column 1-3 size can be changed by dragging in grid, too.

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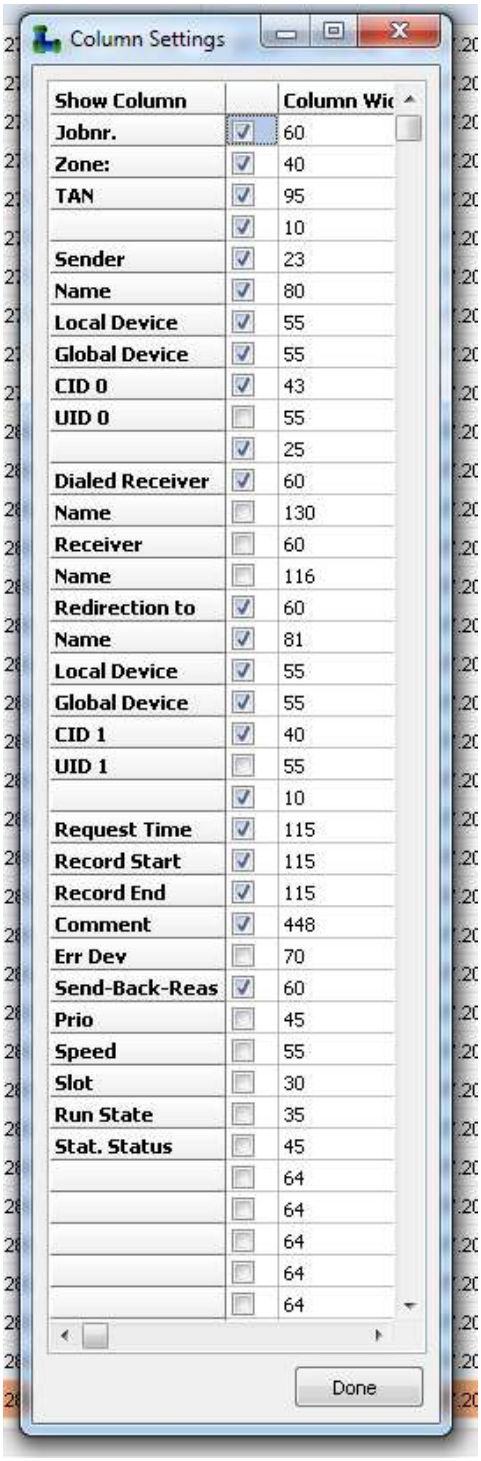

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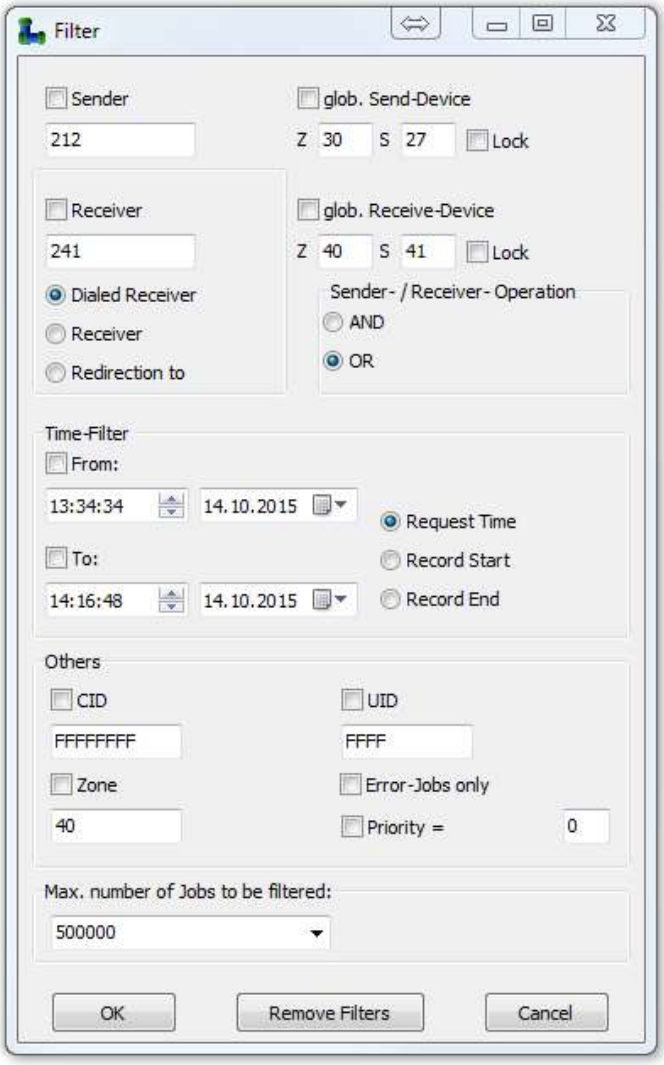
4.1.3.9. Filter:

Use filters to reduce the number of displayed transports or to find a dedicated transport. It is possible to combine several filters. With check-box “Filter On” filters are enabled or disabled.

If R-Tube runs as client it is possible to lock filters. If a filter is locked it is not possible to disable this filter. To lock and unlock filters password of server is required.
When using the carrier-ID-filter all digits must be entered (e.g. 0015).

If there are a lot of records in the transport-list it could take a long time to create and index of filtered transports. Therefore it is possible to shrink the transport-list when creating an index by adjusting “Max. number of Jobs to be filtered”. On slow systems use a lower value.

Note: If “Max. number of Jobs to be filtered” is set to 0 no entries will be shown in the transport-viewer.



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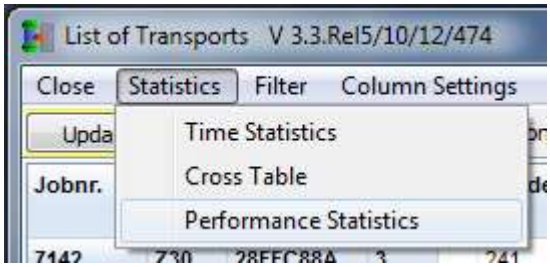
4.1.3.10. Statistics overview

R-Tube provides tree types of statistics:

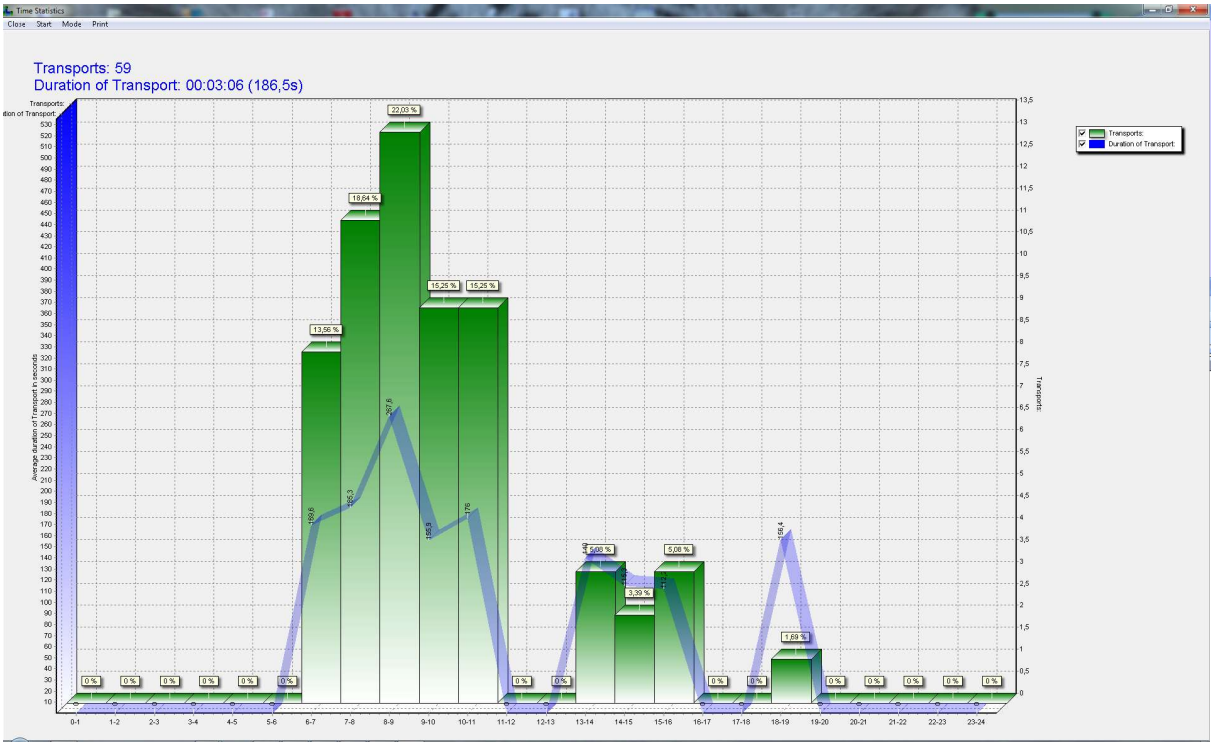
- Time-Statistics
- Cross-Table
- Performance Statistics



4.1.3.11. Time Statistics:

All completed transports („Transport complete“) will be used to create a diagram. Several time-axis are available.
The average duration of transports (from inserting carrier to delivery) is displayed in diagram, too. The average duration of transports indicates how busy the system is.

If filters are active only filtered transports will be used to create the diagram.
To select scale of time-axis please use „Mode“-menu of the statistics-window.



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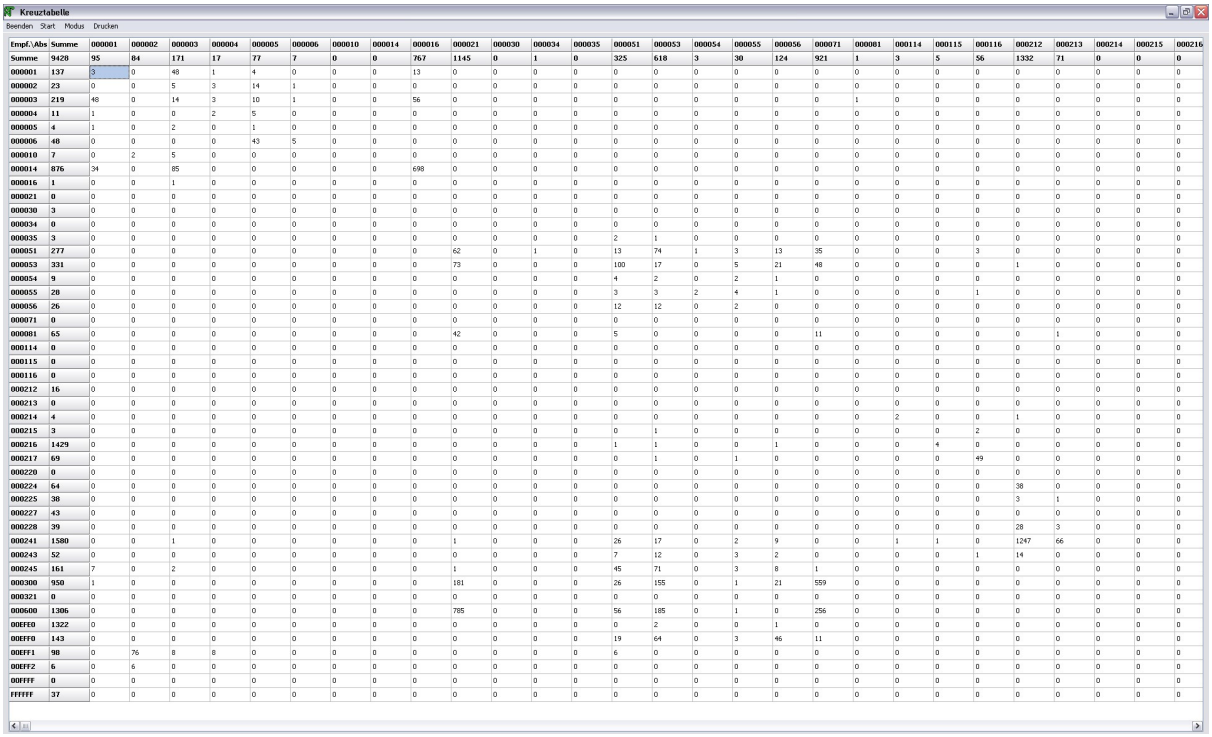
4.1.3.12. Cross-Table:

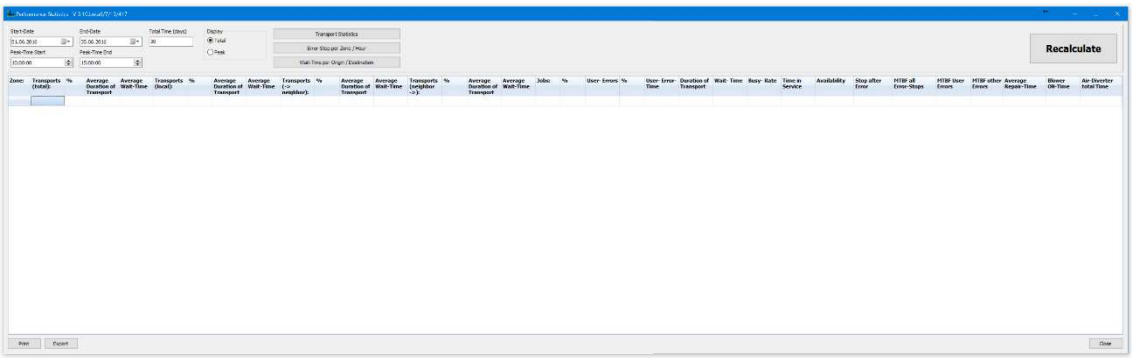
The cross-table shows the number of transports from destination to destination. Active filters are used in this grid. In column and row headers Destination (Origin) or device number and the sum of transports are displayed.
Columns show the sender. Rows represent receiver.



Empf.\Abs	Summe	000001	000002	000003	000004	000005	000006	000010	000014	000016	000021	000030	000034	000035	000051	000053	000054	000055	000056	000071	000081	000114	000115	000116	000212	000213	000214	000215	000216
Summe	9428	95	84	171	17	77	7	0	0	767	1145	0	1	0	325	618	3	30	124	921	1	3	5	56	1332	71	0	0	0
000001	137	3	0	48	1	4	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000002	23	0	0	5	3	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000003	219	48	0	14	3	10	1	0	0	56	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
000004	11	1	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000005	4	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000006	48	0	0	0	0	43	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000010	7	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000014	876	34	0	85	0	0	0	0	0	698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000016	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000030	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000034	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000035	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
000051	277	0	0	0	0	0	0	0	0	62	0	1	0	0	13	74	1	3	13	35	0	0	0	3	0	0	0	0	0
000053	331	0	0	0	0	0	0	0	0	73	0	0	0	0	100	17	0	5	21	48	0	0	0	0	1	0	0	0	0
000054	9	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	2	1	0	0	0	0	0	0	0	0	0	0
000055	28	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2	4	1	0	0	0	0	1	0	0	0	0	0
000056	26	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	0	2	0	0	0	0	0	0	0	0	0	0	0
000071	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000081	65	0	0	0	0	0	0	0	0	42	0	0	0	0	5	0	0	0	0	11	0	0	0	0	1	0	0	0	0
000114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000212	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000214	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0
000215	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
000216	1429	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	4	0	0	0	0	0	0	0
000217	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	49	0	0	0	0	0
000220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000224	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0
000225	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0
000227	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000228	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	3	0	0	0
000241	1580	0	0	1	0	0	0	0	0	1	0	0	0	0	26	17	0	2	9	0	0	1	1	0	1247	66	0	0	0
000243	52	0	0	0	0	0	0	0	0	0	0	0	0	0	7	12	0	3	2	0	0	0	0	1	14	0	0	0	0
000245	161	7	0	2	0	0	0	0	0	1	0	0	0	0	45	71	0	3	8	1	0	0	0	0	0	0	0	0	0
000300	950	1	0	0	0	0	0	0	0	181	0	0	0	0	26	155	0	1	21	559	0	0	0	0	0	0	0	0	0
000321	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000600	1306	0	0	0	0	0	0	0	0	785	0	0	0	0	56	185	0	1	0	256	0	0	0	0	0	0	0	0	0
00EFE0	1322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0
00EFF0	143	0	0	0	0	0	0	0	0	0	0	0	0	0	19	64	0	3	46	11	0	0	0	0	0	0	0	0	0
00EFF1	98	0	76	8	8	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00EFF2	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00FFFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FFFFFF	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.1.3.13. Performance Statistics:

The performance statistics gives an overview on all connected zones. It is usually built on the data of one month (a different period can be selected by changing Start-Date and End-Date). It is possible to have an extra list of values for the peak-time of the system (adjustable by changing Peak-Time-Start and Peak-Time-End).
The filters from 4.1.3.9 are not used in this statistics.



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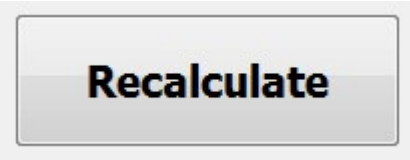
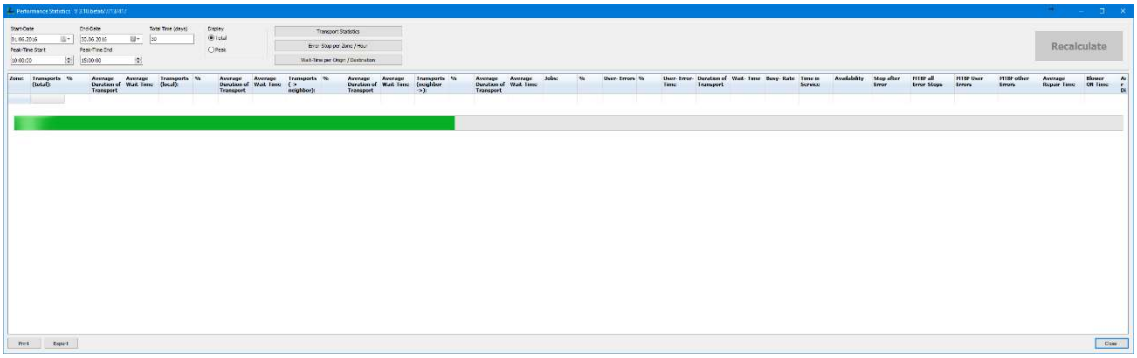
To create performance statistics on the chosen periods click on:

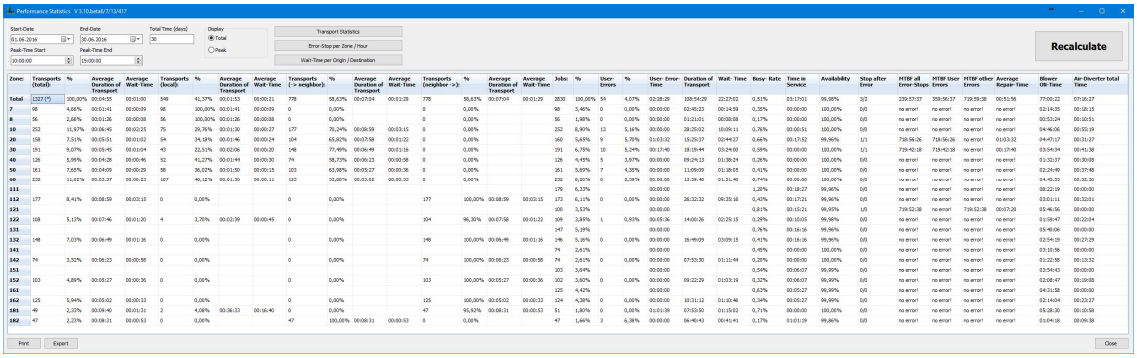


A progress-bar will be shown while statistics data is calculated.



Time needed for calculating all values depends on available data. After calculation is done, statistics-data will be displayed in a list.

Note: To get the buttons for "Transport Statistics", "Error-Stop" and "Wait-Time" the "Statistics Module" in "Settings and Options" of R-Tube Main Program must be enabled.



In systems with more than one zone usually a carrier passes several zones during its transport. Therefore a transport will be counted in several zones. There are four categories of transports counted:

1. All transports who start and/or end in this zone (total)
2. Transports who start and end in this zone (local)
3. Transports who start in this zone and end in another zone (-> neighbor)
4. Transports who start in another zone and end in this zone (neighbor ->)

Transports who pass through and do not start or end in this zone are not counted.
If a zone is designed for pass through only, it could happen that this zone has no transports but a lot of jobs.

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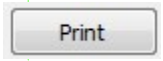
All statistics can be printed. Use Print-Button to open print-dialogue.



To export the tables to any spreadsheet (e.g. EXCEL) use the Export-Button.

Columns:

Zone:

Shows the zone-number.
Possible Values:
Total: Shows the value for the whole system
1..254: Zones

Transports (total):

Transports found in the selected period which have started or arrived in this zone (category 1).
Note (*):
If a Transports starts in a zone and ends in another zone this transport is counted in both zones. The total-count of all zones ignores double-counts.
Note:
The following three columns relate to this column.

[Transports (total)] %:

Percentage of all transports in this zone based on all transports in system.
Note:
In the “Total”-row percentage of local transports and “neighbor” transports will be more than 100% because transports which leave a zone are counted double.
(Percentage of local transports + Percentage of transports to neighbor = 100%)

[Transports (total)] Average Duration of Transport:

Average Transport time from 1st send-request to delivery. (HEH: ID12e)
This value is calculated over all transports of category 1.

[Transports (total)] Average Wait-Time:

Average time of transports (category 1) waiting for departure in send-station or transfer.

Transports (local):

Transports found in the selected period which have started and arrived in this zone (category 2).
Note:
The following three columns relate to this column.

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[Transports (local)] %:
Percentage of local transports (category 2) based on all transports of this zone (category 1).

[Transports (local)] Average Duration of Transport:
Average Transport time from 1st send-request to delivery. (HEH: ID12e)
This value is calculated over all transports of category 2.

[Transports (local)] Average Wait-Time:
Average time of local transports (category 2) waiting for departure in send-station.

Transports (-> neighbor):
Transports found in the selected period which have started in this zone and arrived in another zone (category 3).
Note:
The following three columns relate to this column.

[Transports (-> neighbor)] %:
Percentage of transports to another zone (category 3) based on all transports of this zone (category 1).

[Transports (-> neighbor)] Average Duration of Transport:
Average Transport time from 1st send-request to delivery. (HEH: ID12e)
This value is calculated over all transports of category 3.

[Transports (-> neighbor)] Average Wait-Time:
Average time of transports to another zone (category 32) waiting for departure in send-station and transfer.

Transports (neighbor ->):
Transports found in the selected period which have started in another zone and arrived in this zone (category 4).
Note:
The following three columns relate to this column.

[Transports (neighbor ->)] %:
Percentage of transports from another zone (category 4) based on all transports of this zone (category 1).

[Transports (neighbor ->)] Average Duration of Transport:
Average Transport time from 1st send-request to delivery. (HEH: ID12e)
This value is calculated over all transports of category 4.

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[Transports (neighbor ->)] Average Wait-Time:
Average time of transports from another zone (category 4) waiting for departure in send-station and transfer.

Jobs:
Jobs done in this zone.

Jobs %:
Percentage of jobs done in this zone based on all jobs in system.

User-Errors:
Number of Sender-errors or Timeouts found in this zone.
(When using plastic-bags for transport this value shows how many bags were not in good shape. -> HEH: ID11b)

User-Errors %:
Percentage of User-errors.

User-Error-Time:
Time lost while system was processing a user-error (HEH: ID11b)

Duration of Transport:
Total time of all transports from this zone.

Wait-Time:
Total time of carriers waiting for departure. (HEH: ID11f)

Busy-Rate:
Percentage of time zone was in use in relation to total time of period.
(HEH: ID12h)

Time in Service:
Time zone was in Service-Mode.

Availability:
Percentage of time system was ready to be used in relation to total time of period.

Stop after Error:
Number of stops after an error.
1st value: total number of stops.
2nd value: Stops after an user-error.

MTBF all Error-Stops:
Mean Time Between Failure calculated on all error-stops in the selected period.
(HEH: ID12a)

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MTBF User Errors:

MTBF calculated on error-stops caused by an user-error. (HEH: ID12a)

MTBF other Errors:

MTBF calculated on error-stops not caused by an user-error. (HEH: ID12a)

Average Repair-Time:

Average time from zone on error-stop back to standby. (HEH: ID12c)

Blower ON-Time:

Time blower of this zone was running during the selected period. (HEH: ID11c)

Air-Diverter total Time:

Total time the air-diverter was moving during the selected period. (HEH: ID11c)

Note:
Since R-Tube V3.10 the columns “Average Duration of Transport” and “Average Wait-Time” have been split up into the columns of the four categories of transports.

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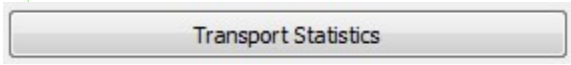
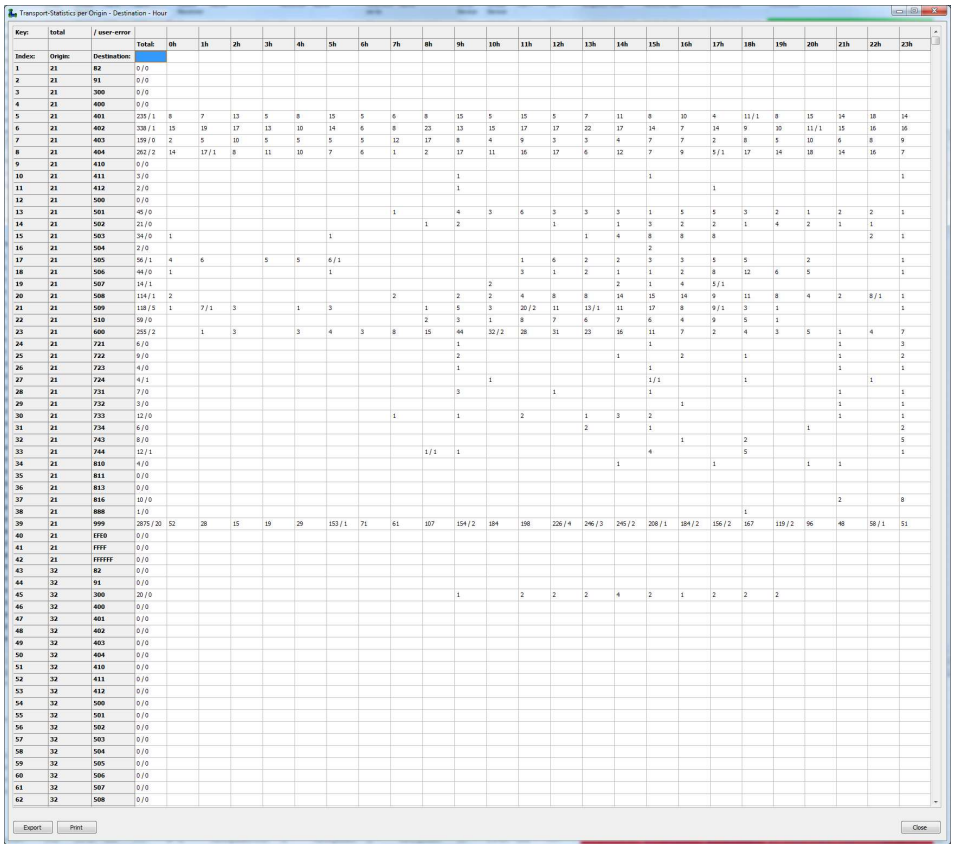
Transport Statistics:

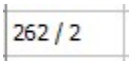


This Button will open an additional statistics showing each pair of sender-receiver that occurred in the selected period and how many carriers arrived during each hour of the day. (HEH: ID11a + ID11c)



Column #1:	Index of rows
Column #2:	Destination-Number of sender (Origin)
Column #3:	Destination-Number of receiver (Destination)
Column #4:	Number of transports between this origin-destination-pair during the selected period.
Column #5 - 28:	Number of transports split up per hour of day

Values:



Number of transports / Number of transports with user-error
If there were no transports between origin and destination no value will be shown in the according cell.

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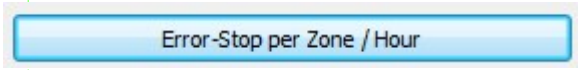
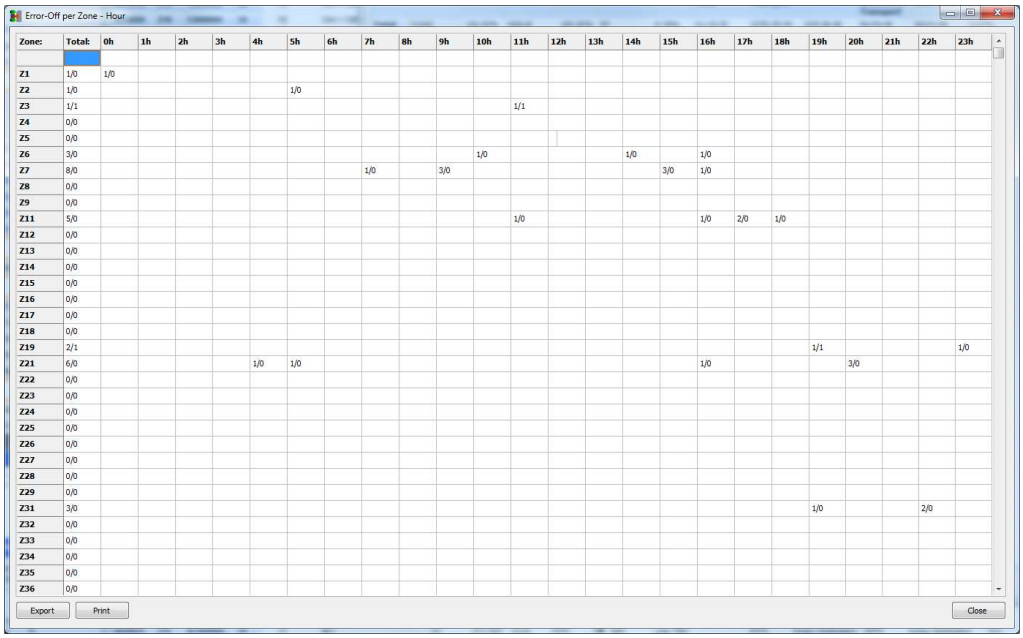
Error-Stop per Zone / Hour:



This Button will open a statistics-window regarding stops after error and hour of day. (HEH: ID11e)



Zone:	Total:	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
Z1	1/0	1/0																							
Z2	1/0						1/0																		
Z3	1/1												1/1												
Z4	0/0																								
Z5	0/0																								
Z6	3/0											1/0				1/0		1/0							
Z7	8/0								1/0		3/0						3/0	1/0							
Z8	0/0																								
Z9	0/0																								
Z11	5/0												1/0					1/0	2/0	1/0					
Z12	0/0																								
Z13	0/0																								
Z14	0/0																								
Z15	0/0																								
Z16	0/0																								
Z17	0/0																								
Z18	0/0																								
Z19	2/1																				1/1				1/0
Z21	6/0					1/0	1/0											1/0				3/0			
Z22	0/0																								
Z23	0/0																								
Z24	0/0																								
Z25	0/0																								
Z26	0/0																								
Z27	0/0																								
Z28	0/0																								
Z29	0/0																								
Z31	3/0																				1/0			2/0	
Z32	0/0																								
Z33	0/0																								
Z34	0/0																								
Z35	0/0																								
Z36	0/0																								

Column #1: Number of Zone
Column #2: Number of stops after error during selected period
Column #3 - 26: Number of stops split up per hour of day

Values:

2/1

Number of stops after all errors / number of stops after user-errors
If there were no errors in this zone no value will be shown in the according cell.

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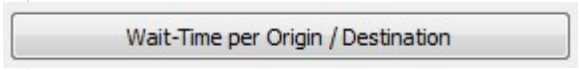
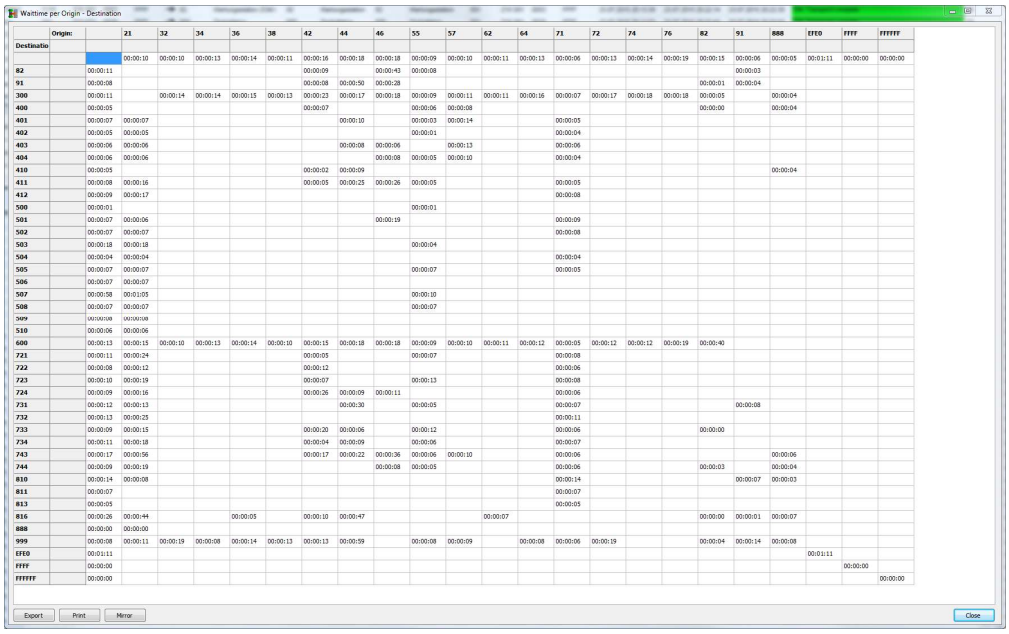
Wait-Time per Origin/Destination:

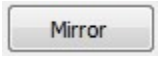


This Button will open the wait-time statistics.
Columns refer to origin.
Rows refer to Destination.
Column/Row #3 shows average wait-time regarding this column/row.



Values have the following format: hh:mm:ss
If there were no transports between origin and destination no value will be shown in the according cell.

Use Mirror-Button to mirror the table (Columns=Destination, Rows=Origin)



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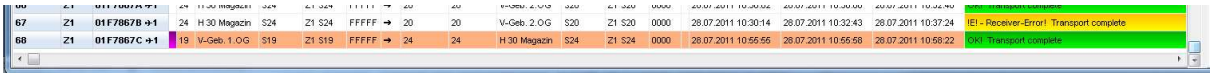
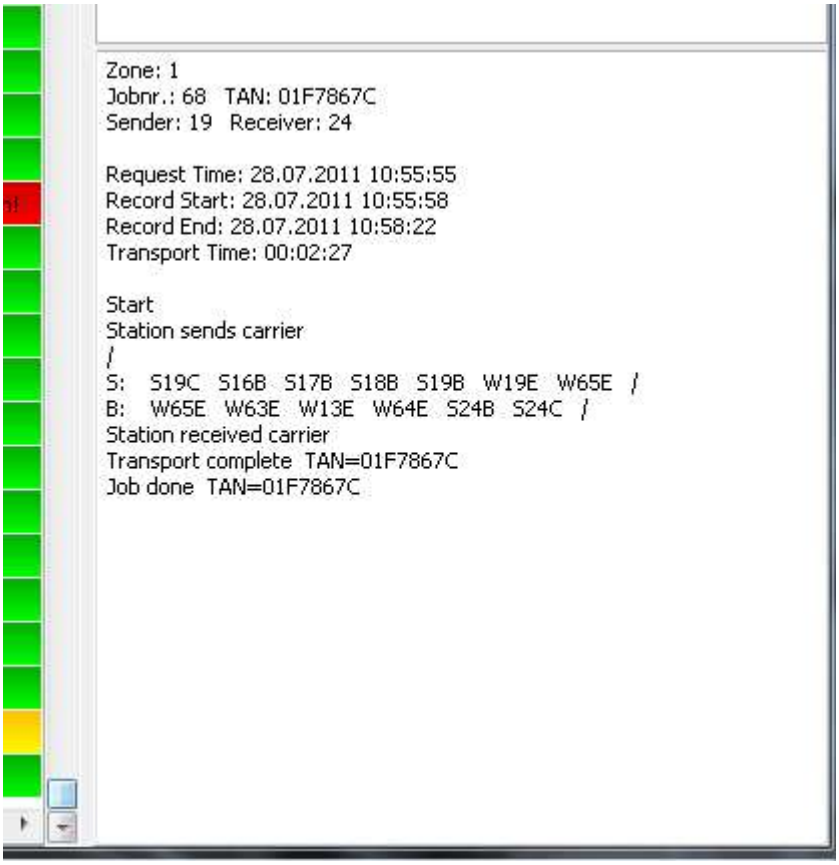
4.1.4. Details- Display

The Details- Display shows the most important details of this transport and all events like blower-status and tube-switches of a selected job.

Cursor:
The selected row is marked in 4th column by a magenta rectangle:



Details:



Selection can be moved by using the mouse wheel .

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The option „long Details“ will add a time-stamp to each event on details-display.

The following shortcuts are used in details-display:

B:	blow
S:	suck
/	blower stop
<->	Air-Diverter moves
S54C	Tube-switch C of Station S54
W52E	Tube-switch E of diverter W52

If a tube-switch is passed several times a “#” and the pass-count are attached to the tube-switch-symbol.
e.g.: W52E#2

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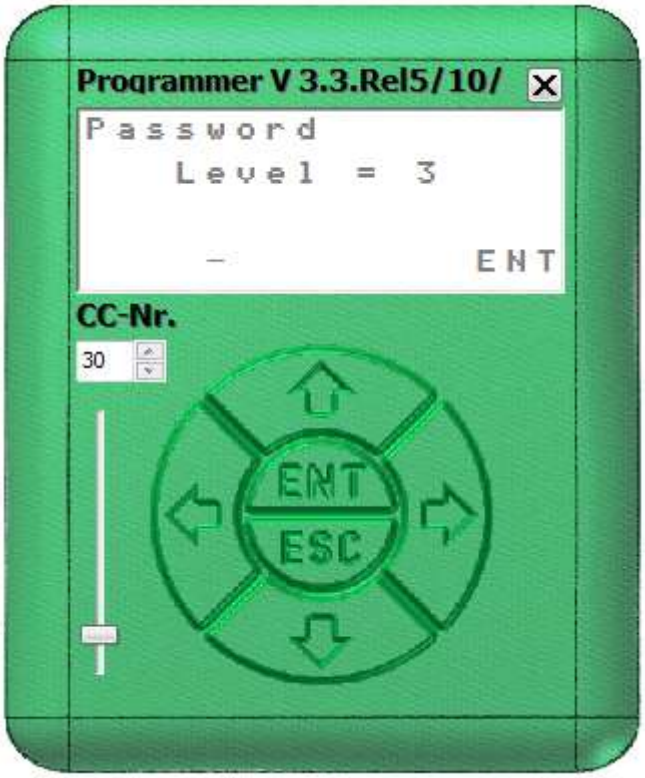
4.2. Programmer



This application is an emulation of the HÖRTIG rohrpost handheld programmer. It is used to communicate with the CC.
The handheld programmer is directly connected to a single CC. It communicates with this CC only.
The R-Tube Programmer can access all CCs. It can be started several times and access different CCs.
There are several ways to select a dedicated CC:

- Use the up/down keys

- Use the track bar on the left

- Use mouse-wheel

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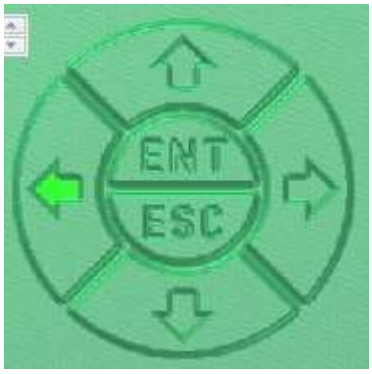
The programmer works as a terminal. It sends all pressed keys to the selected CC. All information and texts displayed are received from CC. Menus and texts depend on Version of CC.
Refer to “Hörtig-E40 Programmer” (E40_ProgF145_EN.pdf) for more details of programmer usage.

The most common keys are also available as click-areas:



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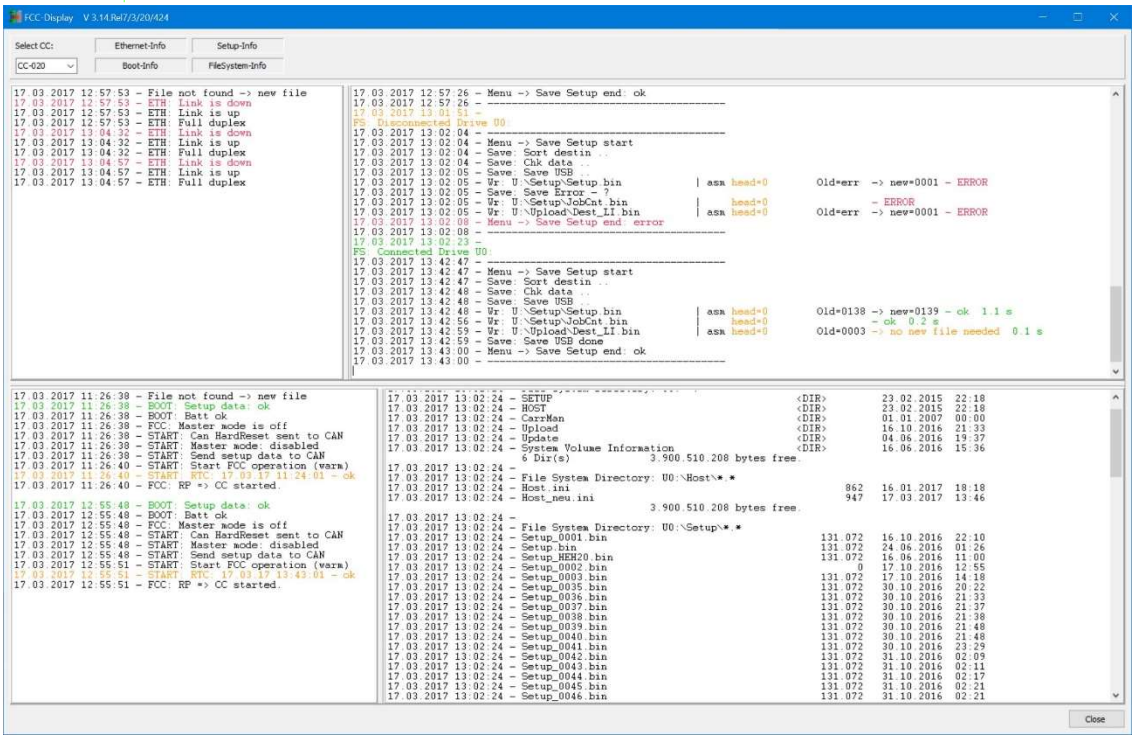
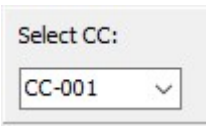
4.3. FCC-Display



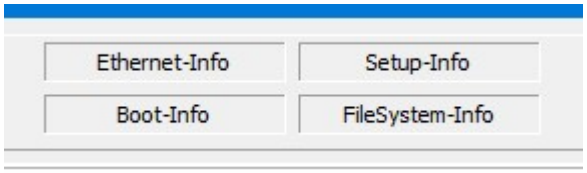
It is a truth universally acknowledged, that a single display on a PCB in possession of a lot of pixels, is always too small…
Due to having no display on the FCC-board, all display-messages are sent to R-Tube.
The FCC-Display application is designed to show all these display-information including a timestamp.
Please select the FCC to be displayed, first:



The display is split up into four screens. Each screen contains information of a special purpose:

1. Ethernet-Information
2. Boot-Information
3. Read and Save Setup Information
4. Filesystem-Information.

The arrangement of screens is shown on top of the window:



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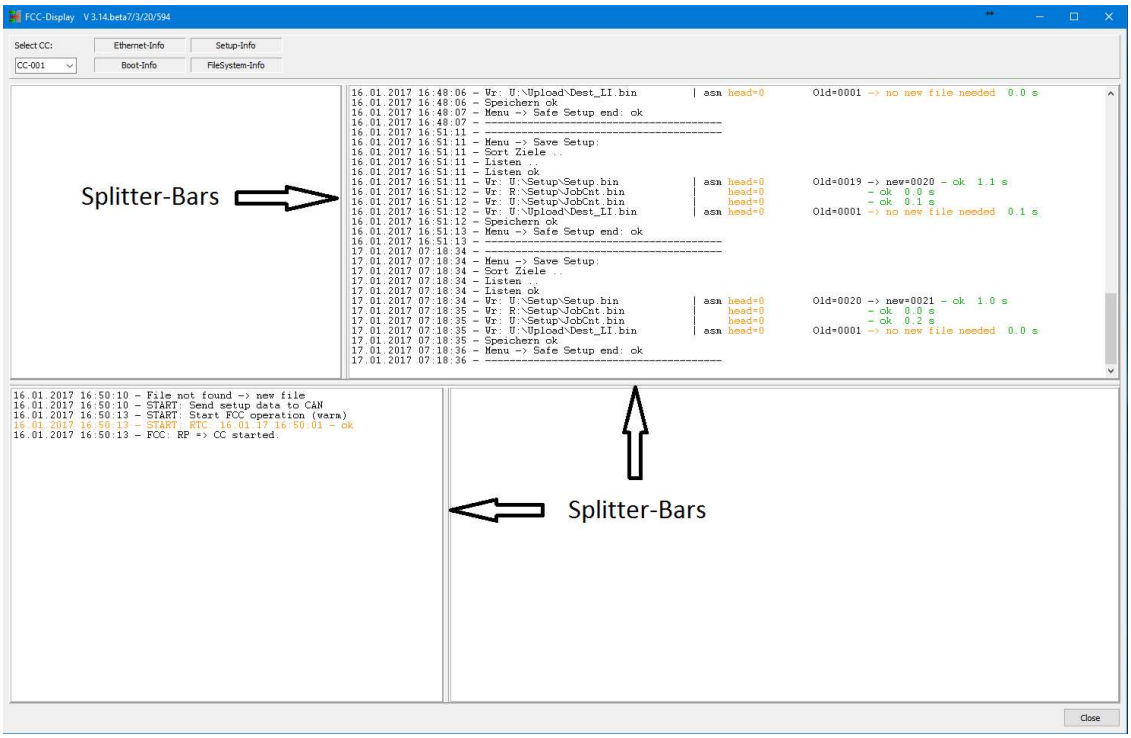
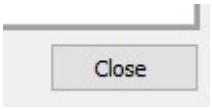
The size of the screens can be changed by moving the horizontal and vertical splitter-bars. After restarting FCC-Display the positions of splitters are restored.



Use “ESC”-Key or Close-Button to close application.



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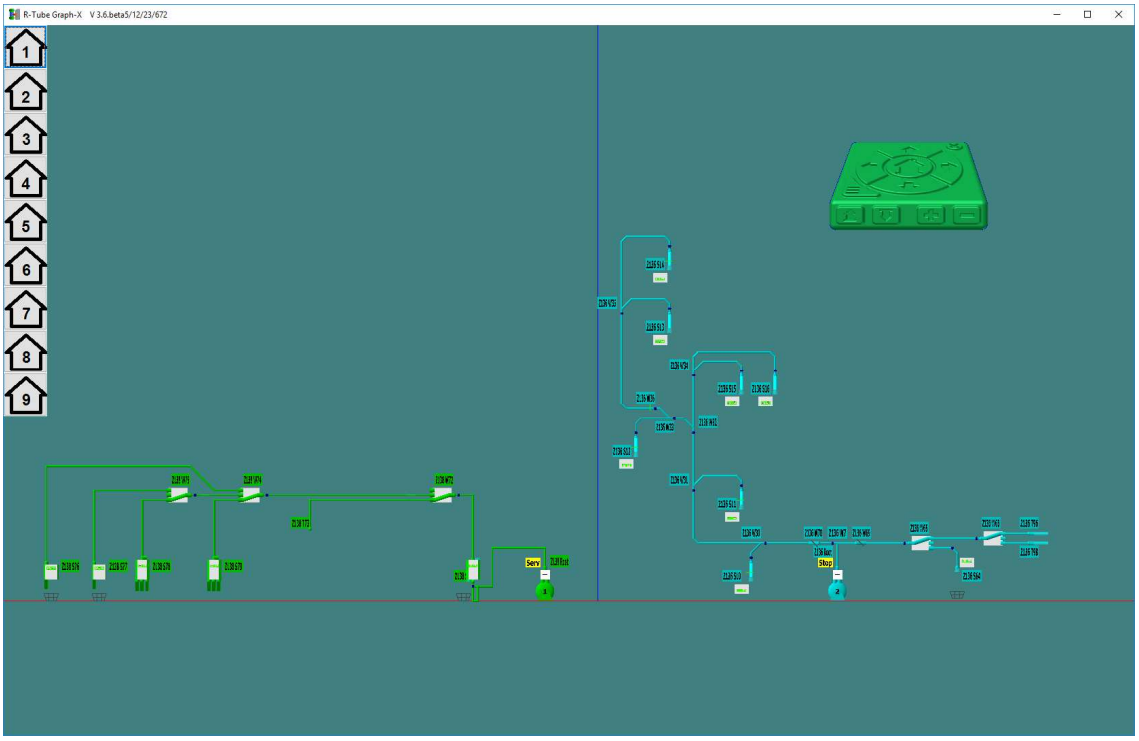
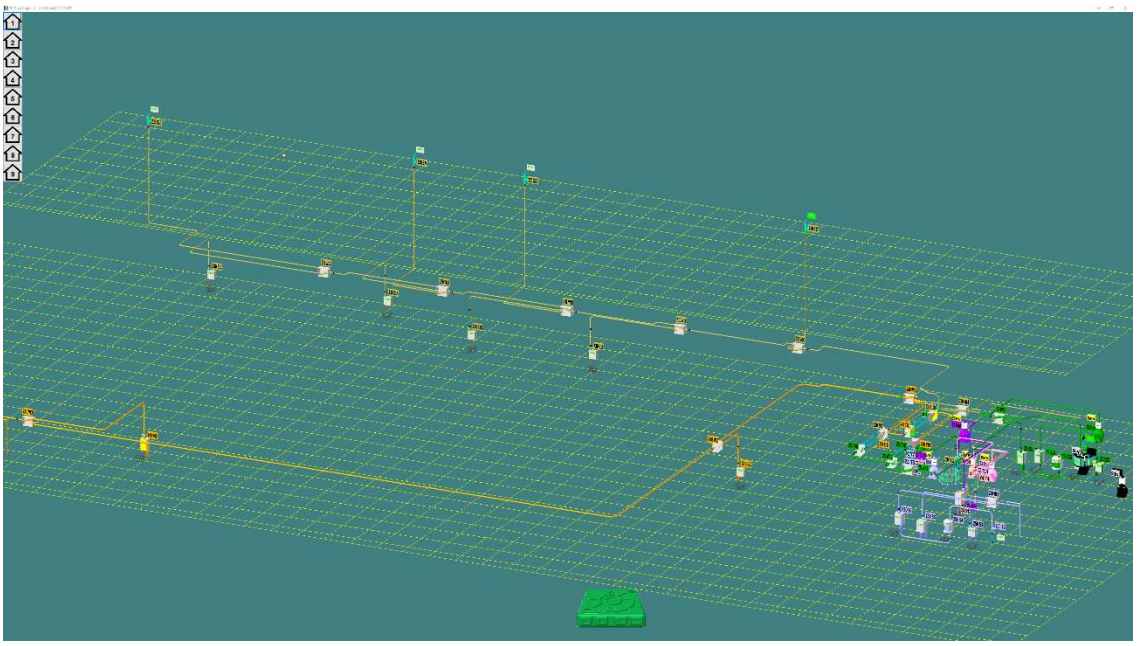
4.4. Graphics

The Graphics application provides a view to the actual state of all connected zones in a 3D-schematic drawing. 2D-schematics are possible, too, as using a flat design and adjusting the viewing-angle to a front-view.





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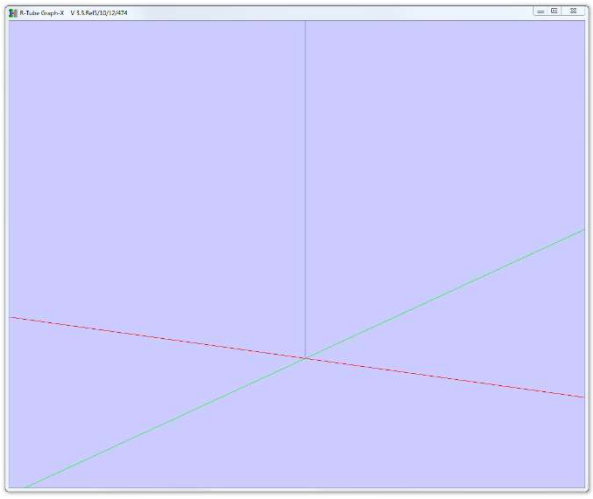
As being designed as a 3D-Graphics navigation through the graphics is implemented as a movement of a camera. The camera can be moved along the 3 main-axis:

- Horizontal (X): red axis
- Vertical (Z): blue axis
- Depth (Y): green axis



4.4.1. Functions of Graphics-Control-Panel:

To navigate through the 3D-graphics use the buttons of graphics-control-panel (GCP).

home-position
On left-click graphics will return to default-view.
Right-click will store actual view as default-view.

Zoom in /out
This function is available in orthographic-camera-mode, only.
In perspective-camera-mode zoom in/out will be done by moving the camera closer to the object of interest.

Camera moves to the left (parallel to red x-axis).

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Camera moves to the right (parallel to red x-axis).

Camera moves forward (parallel to green y-axis).

Camera moves backward (parallel to green y-axis).

Camera moves up / down (parallel to blue z-axis).

Wheel-function:
The mouse wheel will activate the last camera-movement the mouse-pointer was located on (left/right, up/down, forward/backward, zoom in / out). This will work even if the mouse pointer is no longer located above GCP.

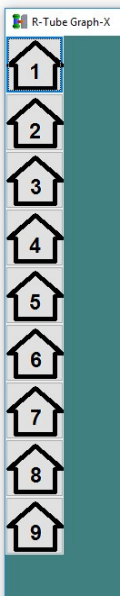
Other Buttons on GCP:

close Graphics application

open options

4.4.2. Graphics functions:

4.4.2.1. Default-View-Buttons



On the left side of the graphics window you find nine buttons to set various home-positions. This could be for example a total view of the system and several details.
Each default-view can be adjusted by a right-hand-click on the according button. The actual view will be saved after a confirmation prompt. Each View can be recalled by a left-click on the according button.
Use keys 1-9 as hot-keys to set the default views.
Default-view 1 is identical to the home-position-button (see 4.3.1)

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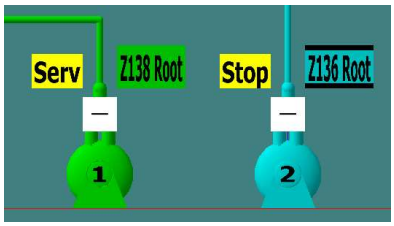
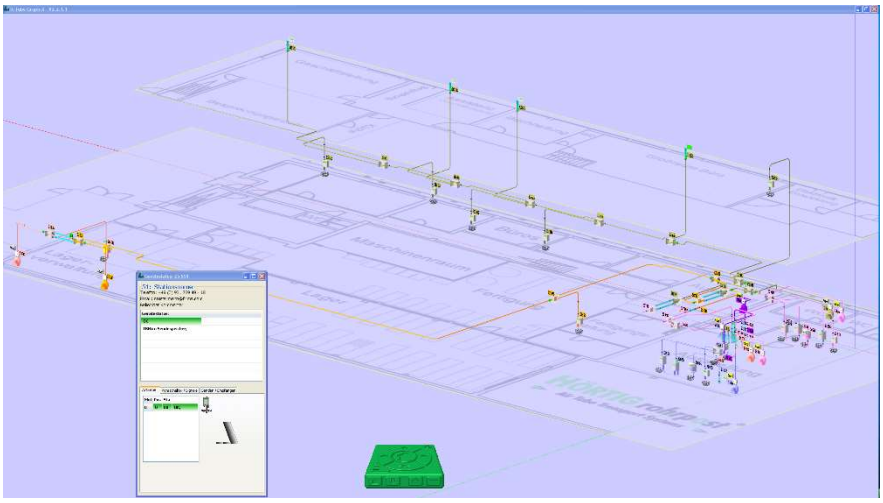
4.4.2.2. Redundant Blowers

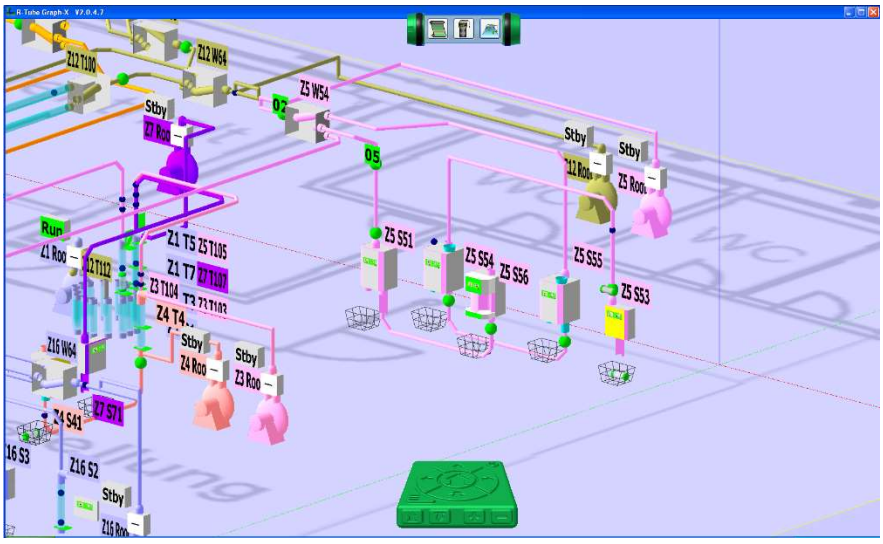
In case of using redundant blowers the number of the blower in use (#1 or #2) will be displayed on the symbol.



4.4.2.3. Double-click on a graphics-object:

A double-click on any graphics-item will move this position to the centre of the graphics-window and zoom in.





Note: A click on the background will be ignored.

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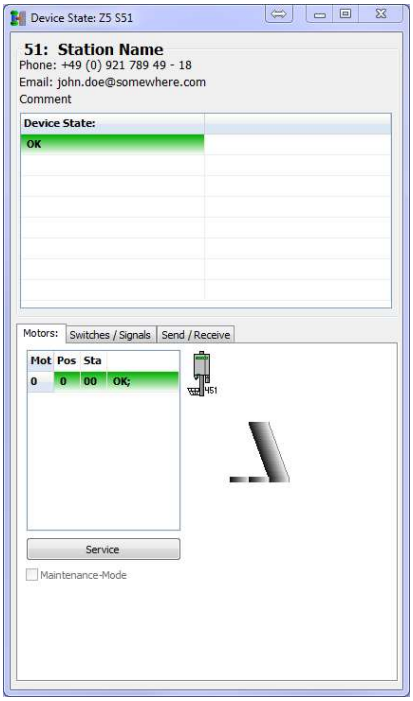
4.4.2.4. Click on Device-Tag:

Each device has a tag with its device-number or device-name.

A single-click on a device-tag will open the status-window of this device.
A double-click will additionally activate the zoom-function (see 4.4.2.1).



For further details about status-window see 4.1.2.1.

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4.4.3. Graphics Options:

Use the options-window to customize R-Tube graphics. The following paragraphs will explain usage of options.

4.4.3.1. View:

Depending on "View" there are various types of graphical display possible:

3D – Perspective Camera
3D –Orthographic Camera
2D – View (Orthographic camera as front-view)

When using orthographic camera all devices stay at same size depending on zoom-factor. There is no regard to distance of an object to camera. 2D-Display is a special viewing-angle (front-view) of orthographic camera.
Perspective camera will display distant objects smaller than objects nearby.

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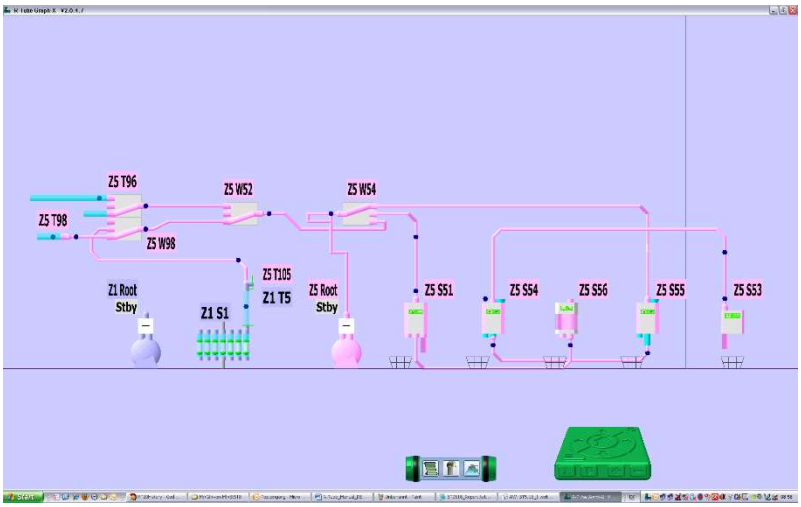
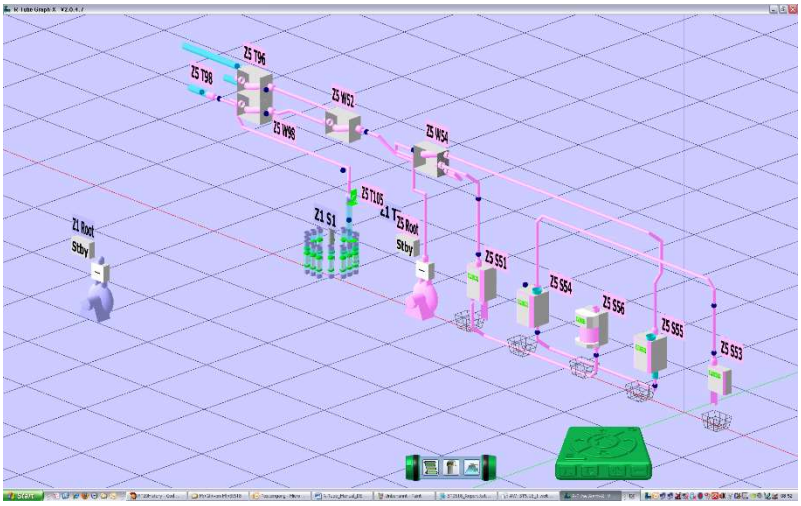
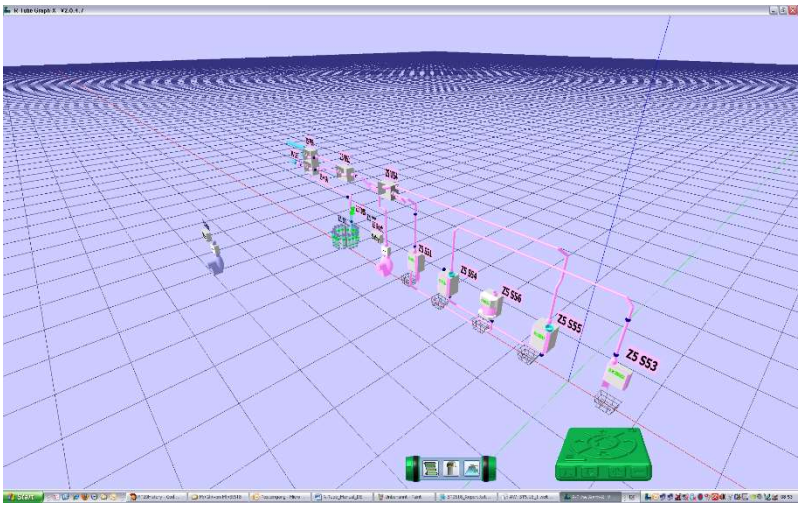
Orthographic Camera as 2D:



Orthographic Camera as 3D:



Perspective Camera 3D:



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4.4.3.2. Viewing Angle:

The representation of objects in 3D is determined by the viewing angle. This is the direction the camera points to from its current position. Change the viewing angle by moving the sliders to choose the best view on the displayed system.
A 2D-View on graphics is a special case of orthographic camera. It is the front-view to the system. To adjust this view, move slider of x-axis to center. Move slider of z-axis to the left. Slider of y-axis seems to do nothing (except completely on the left). A position in the middle is recommended.

4.4.3.3. Set new Home-View:

Apply will set the current view on the graphics as default-view.

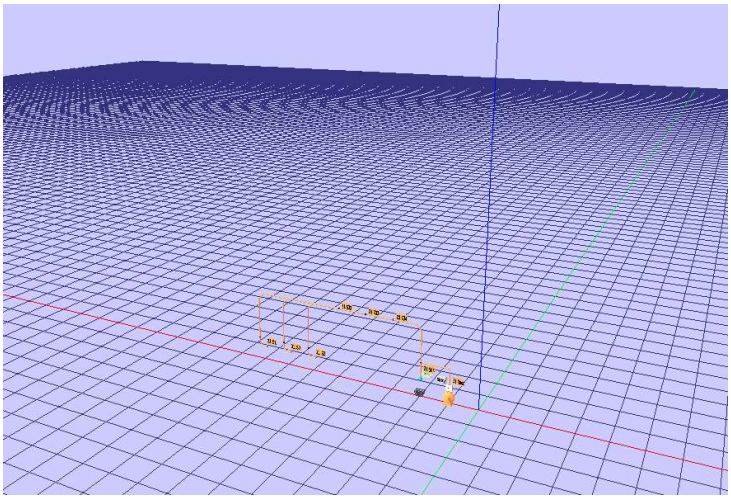
4.4.3.4. Others:

Soft Move:

If a graphics-object is moved to center by a double-click this will be done animated if „Soft Move“ is active. Otherwise the display will change immediately to its new position.
(It is recommented to disable Soft Move on slow computers)

Show Grid / Grid stepping:

To enhance overview and orientation a grid can be displayed on ground level. “Grid stepping” will change width of grid-squares.
.



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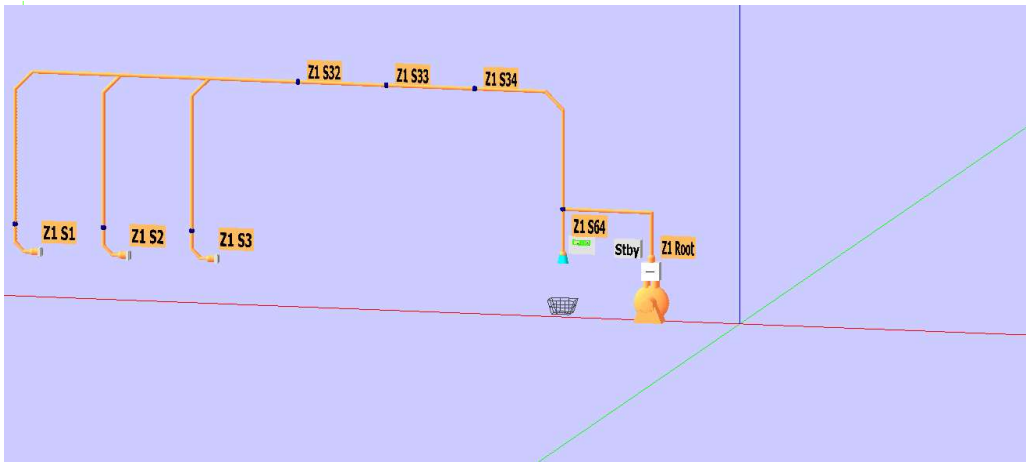
Show Axis:

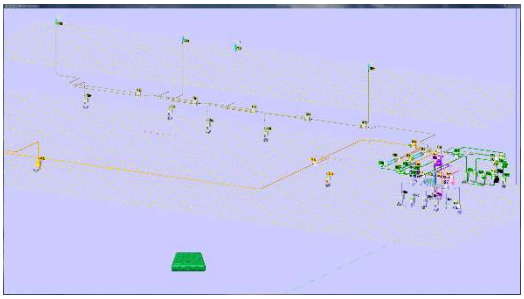
To enhance overview and orientation it is possible to display the coordinate-axis (X-, Y-, Z- Axis). They are coloured as follows:
X- Axis = red
Y- Axis = green
Z- Axis = blue



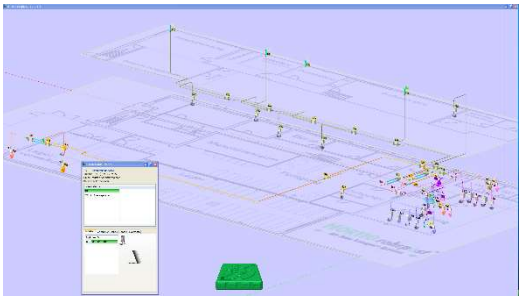
Floor BMP:

Beside devices an tubes R-Tube-Graphics is able to display boxes who represent buildings. Each “building” has a grid on its bottom by default. Activate “Floor BMP” to replace these grids by bitmaps. A dedicated bitmap for each building can be selected (e.g. construction drawings or maps).

Floor BMP not used:



Floor BMP used:



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2D- Navigation:

This option will change the function of the forward-/ backward- keys. Forward and backward will work as up / down if 2D-Navigation is active.

Background Color:

A Color-Dialogue will pop up. Select color of background and click ok. Selected color will be used as background color.

Auto Zoom:

This function will zoom automatically on a device which reports a warning or an error. There are several leves of sensitivity. According to the level of sensitivity (from off to worst problem) Auto Zoom will be activated.

Off
Zone ERROR off
Device Error
Motor Error
Full Basket

Note:
To display the 3D-Graphics R-Tube will use OpenGL. Some onboard graphic cards have problems to display everything correctly. In case of using the graphics feature we strongly recommend to use a dedicated graphics card.

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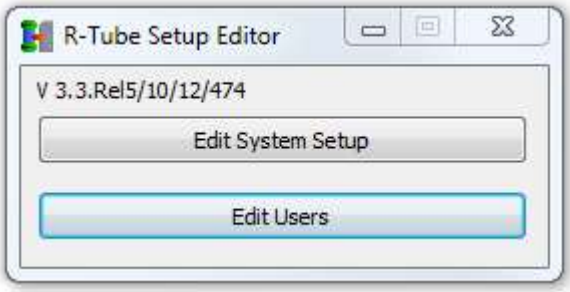
4.5. Setup Editor



The Setup Editor has two major functions:

1. Edit System Setup
2. Edit Users

Warning:
Only trained persons should use the Setup Editor. It is possible to change parameters which are important for correct function of R-Tube or Tube-system!

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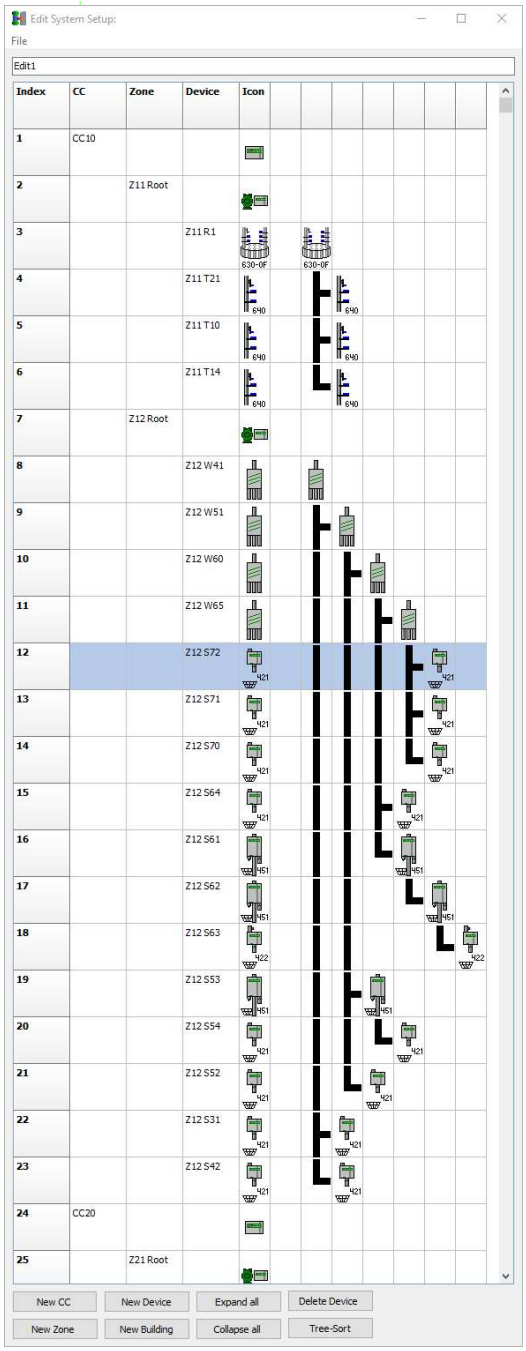
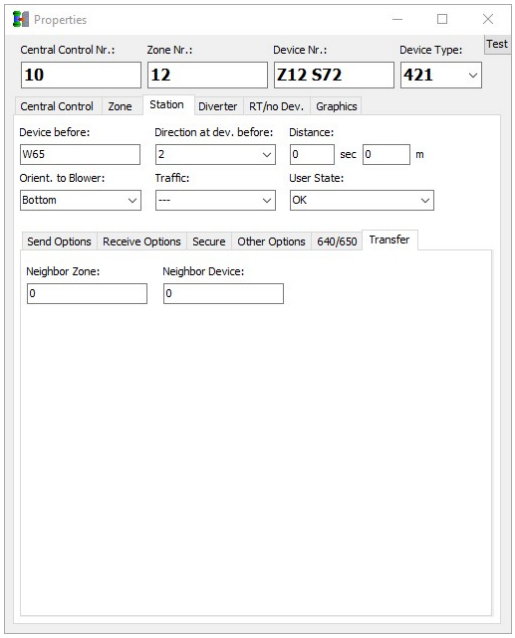
4.5.1. Edit System Setup:





The system-setup-editor is intended to show all setup settings including graphics data. Due to reworks on data-protocols a data-transfer from or to DCS is not possible at present. So the main purpose of this part of R-Tube is the graphics-programming. If there is a setup-file found in database-folder it will be opened and displayed automatically.
To create a system-setup „by hand" use buttons to add the basic elements: Central Controler (CC), Zones, Devices and Buildings.

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When adding a new element some basic informations like CC-, Zone or device-number have to be entered.

New CC

This will add a new CC to the device-tree.

New Zone:

This will add a new zone (Root) to the device-tree. It will be added to the actual selected CC.

New Device:

This will add a new device to the device-tree. It will be added to the actual selected zone.

Delete Device:

This will remove the selected device from setup. Only devices at the end of a branch can be deleted.

New Building

This will add a building to the device-tree. All buildings belong to zone 0 (zone 0 is not used in physical system).

Expand /Collapse all:

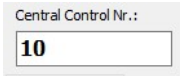
This will expand or collapse all branches of the device-tree.

Tree-Sort:

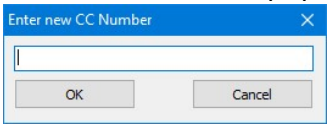
This will update the display of the tree-structure.

Changing important values:

To change a CC-number, select CC and Click on CC-number:

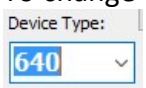


A small window will pop up to enter new CC-number:



For changing zone and device numbers click into the according areas of the editor:

To change type of a device select a new type from the pull down menu “Device Type”:



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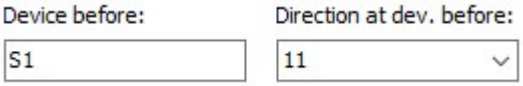
To create a tree structure as known from CC-setup you have to edit values of “Device before” and “Direction at dev. Before”:



All devices should be in the same order as it is in the real system. Otherwise the graphics cannot show correct state of the system.

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4.5.1.1. Transfer Setup-Data from Central Control to PC (Load from CC):

This function is disabled at present.

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4.5.1.2. Load from Disk:

This will load setup data from hard disk. After start of application this function is executed automatically.

4.5.1.3. Save to Disk:

This will save the actual data to hard disk.

4.5.1.4. Print:

The print-function opens a printer-dialogue to select printer. After selecting printer setup-data will be printed.

4.5.1.5. Close:

This will close system-setup editor.

Note:
There is a warning of erased data. The setuptransfer does not erase devices from the list. But it will modify existing data.

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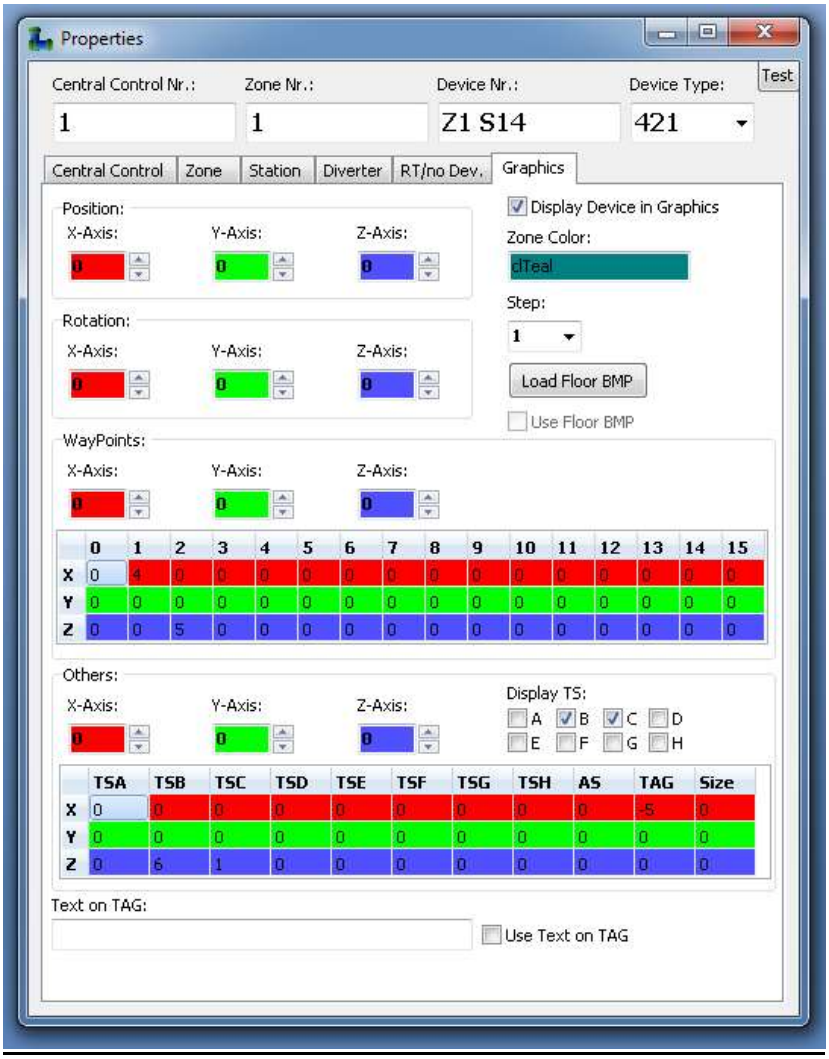
4.5.1.6. Edit Graphics-Data:



After selecting a device the graphics-data for displaying in R-Tube Graph-X can be modifyed. The colors (red, green, blue) refer to the coordinate-axis in Graph-X .

Position:

Set position of device in graphics here.

Rotation:

Use this function to rotate selected device in 90°-steps.

WayPoints:

The way-points mark the track of tube to the device before in direction to blower. Coordinates are calculated relatively to way-point before. Way-point 0 is calculated from tube of device.

Others:

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Enable and set position of tube-switches here. Coordinates are calculated from device-position.
The values of AS are not yet in use.
Adjust position of device-number-tag by changing values of „TAG“ .
Adjust size of buildings by changing the „Size“-parameter.
Text on Tag:
Enter a user-defined text here, to be displayed on tag.

Use Text on Tag:

This option enables user-defined text on tag. When this option is off standard text will be displayed (e.g. Z5 W54).

Zone Color:

This will select the color of tube and devices of this zone. Zone color can only be changed at root-device. Click on colored rectangle to open color-dialogue.

Load Floor BMP:

Building-objects are displayed with a grid at bottom. This grid can be replaced by a bitmap. Click on “Load Floor BMP” to select bitmap. To enable this replacement “Use floor BMP” must be enabled.

Note:
Only 24-Bit-BMP-files are supported by this function. Other file-types (e.g. JPG) must be converted.

Use Floor BMP:

Select if bottom-grid of a building-object should be replaced by selected bitmap.

Step:

Adjust stepping of mouse-wheel and up-/down-buttons.

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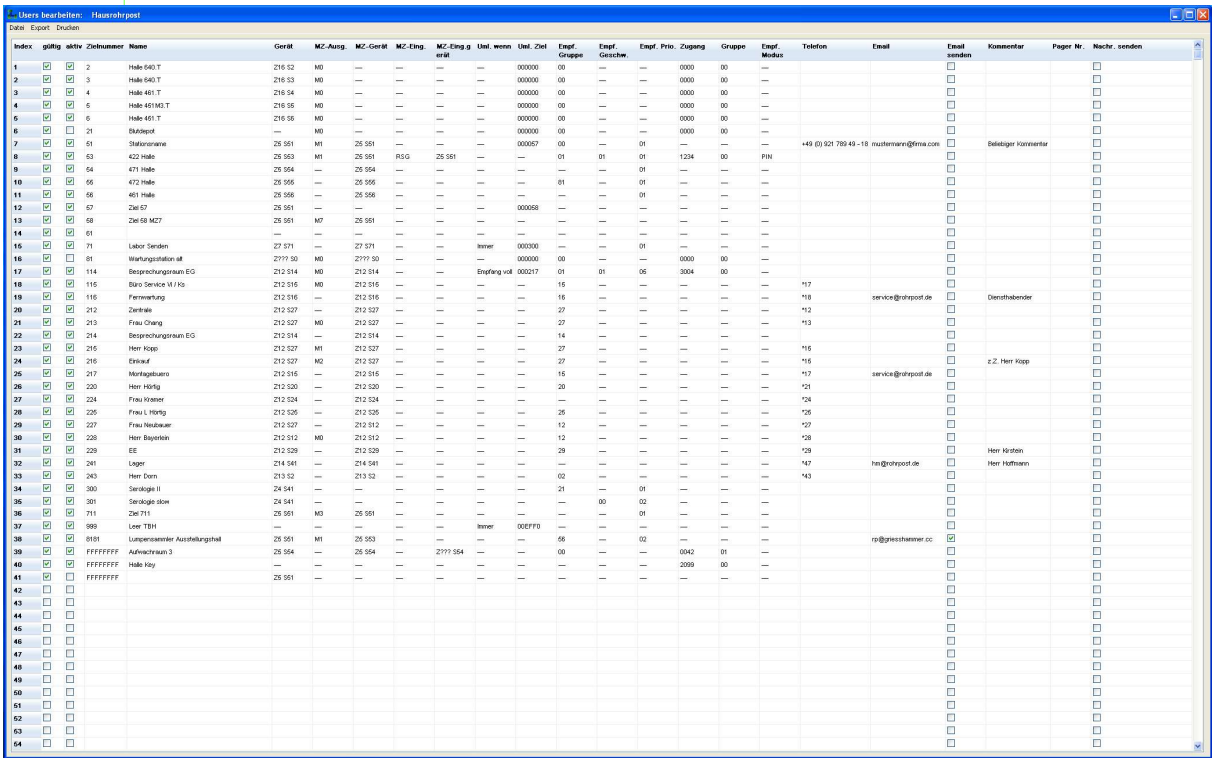
4.5.2. Edit Users:

„Edit Users“ will open a grid to enter and modify users-list and –options used in connected system. This list is used to diplay destination-names in transport-viewer. R-Tube provides a transfer of user-data from central controlers to user-editor.



To display a name in the transports-viewer the user must be marked as “valid”. Use “Sort and Save”-function in pulldown menu to sort list and save it to disk. The actual user-data will be used after next restart of transports-viewer.

If a SMTP-server is available (see “Settings and options” / “Email settings”) the email-option can be activated for each user serparately. After arrival of a carrier at a station an email will be send to the corresponding user.

Pager-functions are not yet available.

Columns „Name“, „Phone“, „Comment“ are also used in device-status. If there are several destination-numbers programmed on one device, values of user with lowest destination-number will be used.
To give a name to a “root”-device (blower) use Zone-number as destination. (root of zone 1 ➔ destination = Z1).

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4.5.2.1. Transfer User-Data from Central Controler to R-Tube:

This function is disabled at present.

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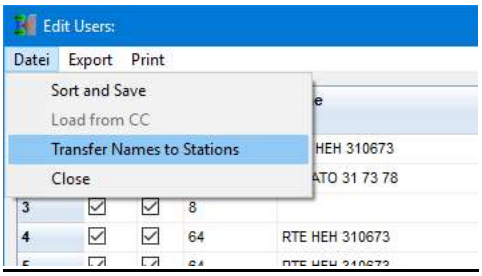
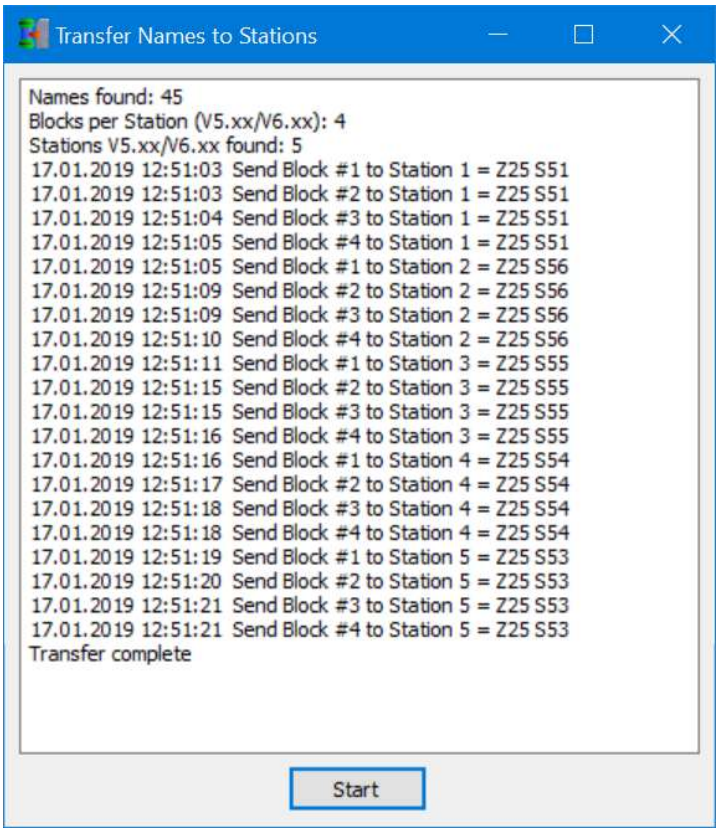
4.5.2.2. Transfer Names to Stations:





This function is will upload the destination-names to the stations.

Note:
This function supports only H61E-Station with Software V5.xx and V6.xx.
H61F-Stations (Software FST7.xx) are not yet supported.

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4.5.2.3. Export:

As known from transports-viewer there is an Excel- and CSV-export function to export the user-list.

4.5.2.4. Print:

This will print the user-list. Before printing a printer-dialogue will be opened to select and adjust printer.

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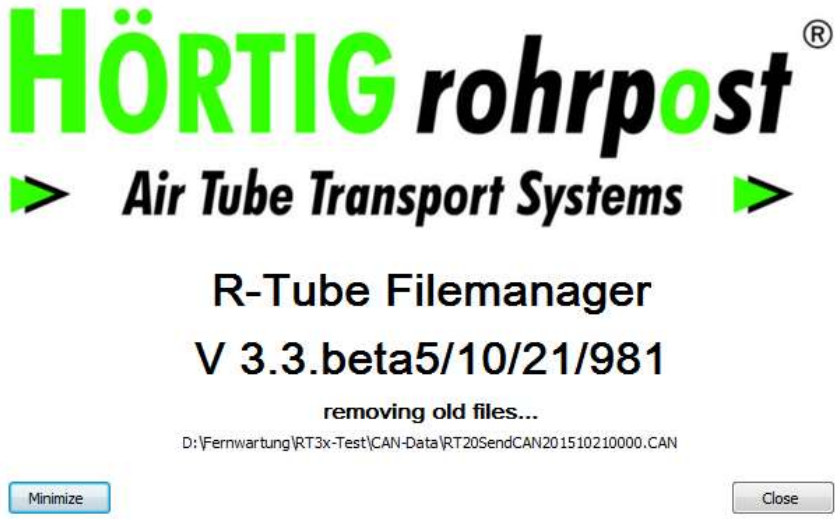
4.6. File-Manger

The File-Manager is automatically started by R-Tube to clean up disk space.
Note: Do not abort this program. In order to keep R-Tube functional, cleaning up disk space is necessary.



4.7. Relauncher

This application is started if R-Tube needs to be restarted after a change of basic options (e.g. Database directory).
Use Buttons to cancel restart or to restart immediately.

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5. Hotkeys:

5.1. All applications except Programmer and Main-Application:

ESC	Close / Close Window

5.2. Main-Application:

F2	Start Transports-Viewer
F3	Start Programmer
F4	Start Graph-X

5.3. Programmer:

Cursor up	8	up
Cursor down	2	down
Cursor left	4	left
Cursor right	6	right
ESC		ESC
Enter		ENT
mouse wheel		change CC

5.4. Graph-X:

Cursor up	forward
Cursor down	backwards
Cursor left	left
Cursor right	right
Page up	up
Page down	down
+/-	Zoom +/-
mouse wheel	change last used direction (left / right, up / down, forward / backward, Zoom)
1 – 9	Default View 1 - 9

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6. Support Info

For questions contact Technical Service:

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