PC Tool CU 300

GB **Installation and operating instructions**

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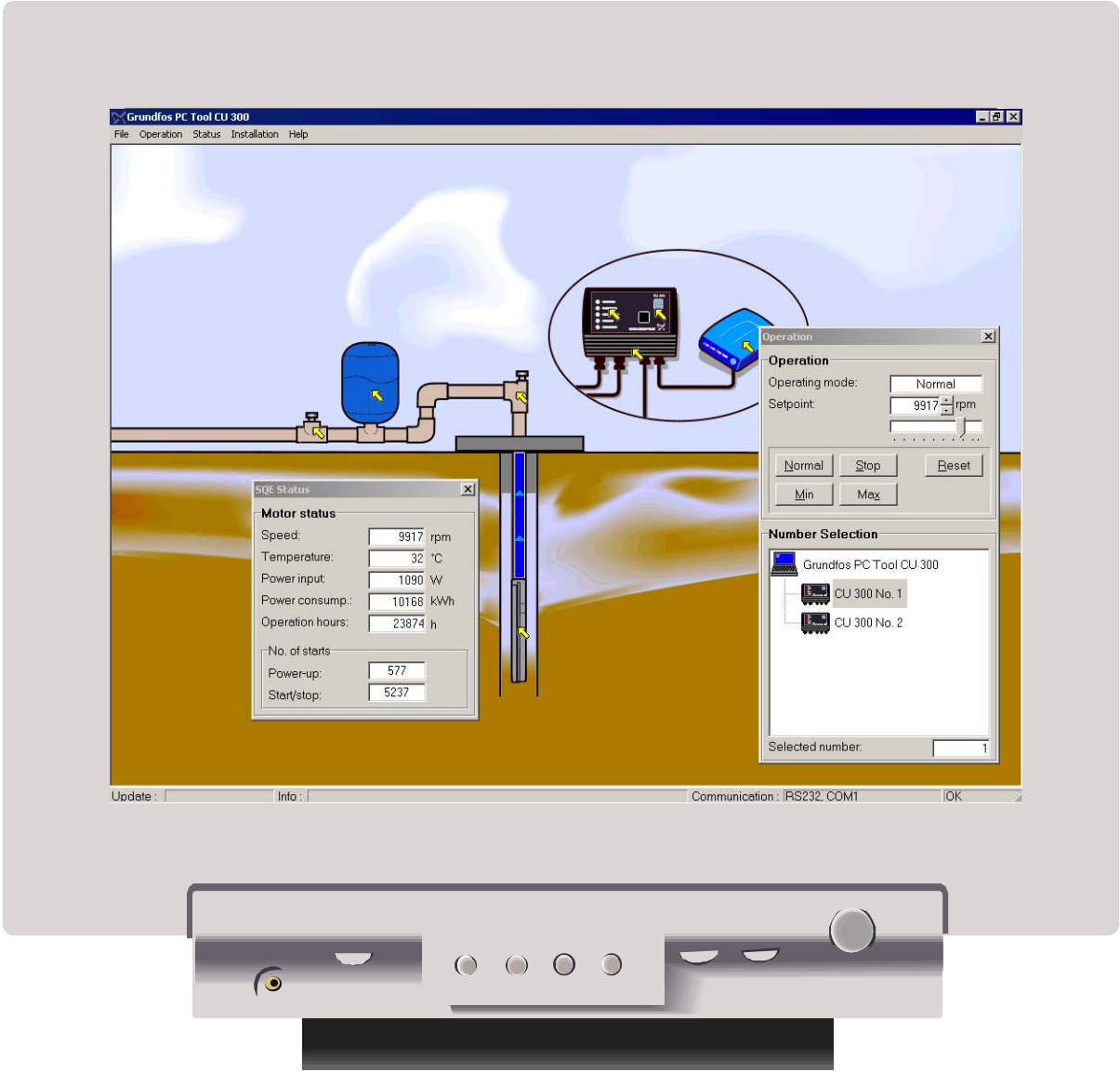
GRUNDFOS®

Introduction

PC Tool CU 300 kit
The PC Tool CU 300 kit you have just opened consists of:
- 1 CD ROM containing PC Tool CU 300 software, these installation and operating instructions and documents mentioned under references.
- 1 Grundfos CU 300 RS-232 cable for a connection of a PC to CU 300.
- 1 Registration card.
- These Installation and operating instructions.

System requirements
The minimum system requirements of the PC Tool CU 300 software are as follows:
- Windows 95/98/NT/ME/2000/XP.
- Pentium 100 MHz or higher.
- 16 Mb of RAM memory.
- 9 Mb of hard disk space.
- Monitor resolution 800 x 600 or higher.
- Mouse or other pointing device.
- RS-232 COM port.

Contents
These Installation and operating instructions cover the following topics:

References
For further information, please refer to...
- CU 300 Installation and operating instructions, 96427972 xxxx.
- G100 Installation and operation instructions, 96428779 xxxx.
- PC Tool Link adapter instructions, 96475749 xxxx.

Description

Purpose: PC Tool CU 300 can be used for...

- Configuration of CU 300 and SQE pump (e.g. during installation).
- Interactive operation and monitoring of SQE pump installations with CU 300.
- Troubleshooting CU 300 and SQE pump.
- Demonstration of CU 300 and SQE pump functionality for training or sales purposes.
- Showing perspectives in CU 300/SQE pump networking and SCADA system applications.

User interface   PC Tool CU 300 uses a graphics based user interface with active zones (hot spots), giving the user a visual impression of control actions and the relation between the data information and the physical pump application.

Possibilities   Via the interactive graphics the user can operate and monitor single CU 300 units or complete GENIbus networks of up to 32 CU 300 units.
Via a modem or via the Grundfos gateway G100 with radio or modem the PC Tool CU 300 can operate distant single CU 300 units or large CU 300 networks.

Optional connections   There are three main options for connection of a PC to a CU 300:

1. Using RS-232 for direct connection, see fig. 1, 1a, or connection via modem, see fig. 1, 1b.

2. Connection to GENIbus via the GRUNDFOS PC Tool Link adapter, see fig. 1, 2.

3. Via G100 port 1 (using the G100 Radio/Modem/PLC version in the following referred to as the R/M/P version), see fig. 1, 3.

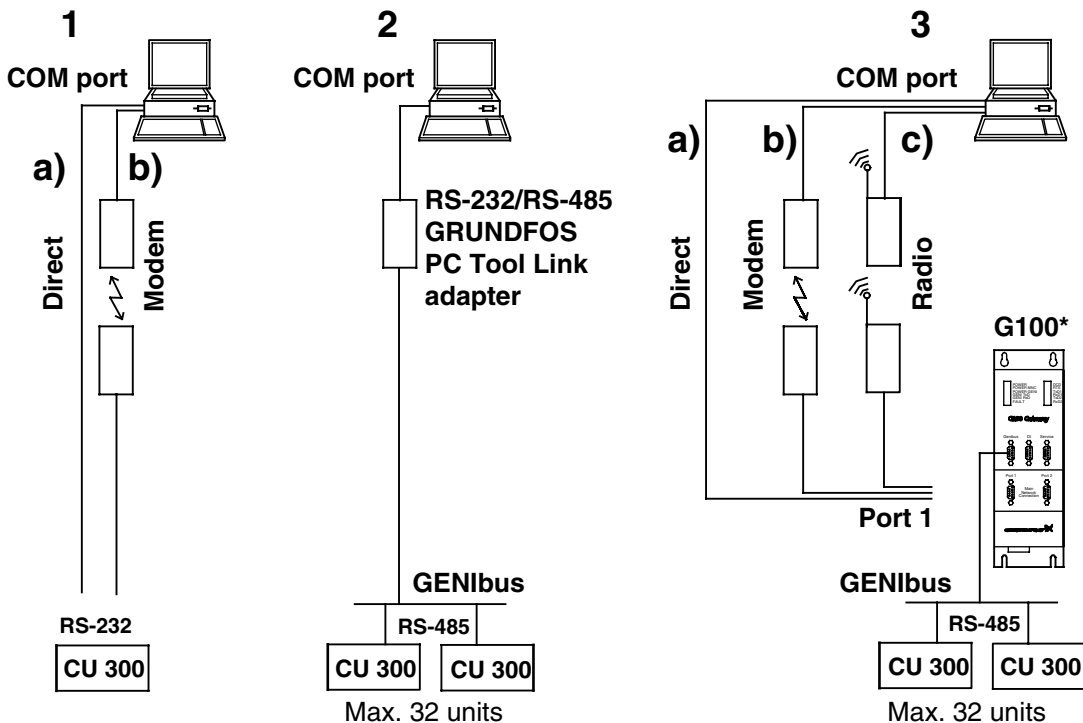The connection to choose depends on your application and your requirements.

Fig . 1 Different connection options.

   *) The version shown is an R/M/P version.
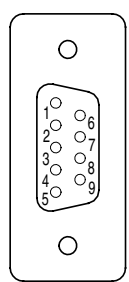   The service port can be used on any G100 version for direct and modem connection.

   Note: Only connection 1a can be made without extra cables or equipment.

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Description of all the connection possibilities	The table below describes the different connection possibilities shown in fig. 1.

Note: The PC Tool CU 300 kit does not include modems, radios, bus cable, D-sub connectors or standard RS-485/RS-232 adapters. Nor does Grundfos supply these parts. Included are only the necessary cable for a direct PC connection to one CU 300. The pin for connection to the CU 300 TxD terminal is marked black.

Connection	Description	Requirements
1, a) **RS-232**	Direct connection to a single CU 300. Use the special RS-232 PC cable supplied with the tool and connect to the CU 300 RS-232 terminals.	1 Grundfos CU 300 RS-232 cable (included).
1, b) **Modem**	For remote communication with single CU 300 installations. Use the CU 300 RS-232 terminals to connect to a modem according to the wiring specification below.	1 CU 300-to-modem cable. 1 standard modem cable. 2 standard modems.
2 **GENIbus**	For connection of up to 32 CU 300 units via GENIbus. Use the CU 300 RS-485 bus terminals (A, Y, B) and connect the PC via a GRUNDFOS PC Tool Link adapter.	1 PC Tool Link adapter. Twisted-pair bus cable with screen.
3, a) **G100 direct**	Direct connection via G100 to a network of up to 32 CU 300 units. Use the CU 300 RS-485 bus terminals (A, Y, B) to connect CU 300 to G100 according to the wiring specification below.	1 G100 Radio/Modem/PLC. 1 standard RS-232 cable. Twisted-pair bus cable with screen. 1 Sub-D, 9 pin connector to G100.
3, b) **G100 modem**	Modem connection via G100 to a network of up to 32 CU 300 units. Use the CU 300 RS-485 bus terminals (A, Y, B) to connect CU 300 to G100 according to the wiring specification below.	1 G100 Radio/Modem/PLC. 2 modems. 2 RS-232 modem cables. Twisted pair bus cable with screen. 1 Sub-D, 9 pin connector to G100.
3, c) **G100 radio**	Radio connection via G100 to a network of up to 32 CU 300 units. Use the CU 300 RS-485 bus terminals (A, Y, B) to connect CU 300 to G100 according to the wiring specification below.	1 G100 Radio/Modem/PLC. 2 radios. 2 RS-232 radio cables. Twisted-pair bus cable with screen. 1 Sub-D, 9-pin connector to G100.

Wiring specification for the different cable connections

Cable connector	Pin No.	CU 300 RS-485 to G100 GENIbus	CU 300 RS-232	
			To PC [1]	**To modem**
	1	-	-	RI
	2	A	TxD	RxD
	3	B	RxD	TxD
	4	-	[2]	DTR [3]
	5	Y (GND)	GND	GND
	6	-	-	-
	7	-	-	DTR [3]
	8	-	-	-
9-pin D-sub female.	9	-	[2]	-

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[1] This cable is included in the tool package.
[2] Connect these together in CU 300 terminals.
[3] DTR is connected to both pin 4 and pin 7 of the cable connector.

List of products

Product	Product No.
G100 R/M/P	96 41 11 36
GRUNDFOS PC Tool Link adapter	96 47 20 84

Installation

Software Installation   Use the following procedure when the PC Tool CU 300 software is installed on a PC:

Step	Action
1	Place the CD ROM in the CD drive.
2	With the Windows Explorer locate the file setup.exe on the CD ROM and double click it.
3	From here the program will guide you through the installation.

When you have completed the installation, the PC Tool CU 300 program can be run via the start menu:
Start | Programs | Grundfos PC Tools | PC Tool CU 300.

Hint   Use the following procedure if you want to make a shortcut PC Tool CU 300 icon on your desktop:

Step	Action
1	Open the Windows explorer by right-clicking the Start icon and select 'Explore'.
2	Open the folder: **Windows \ Start Menu \ Programs \ Grundfos PC Tools**.
3	Right-click the PC Tool CU 300 menu item and select 'Create Shortcut'.
4	Right-click the created shortcut and select 'Rename'.
5	Name it "PC Tool CU 300" and drag the item to the desktop with your mouse.

CU 300 installation   No special configuration of CU 300 is needed to use the tool. Just connect the right cable to the right terminals as described and illustrated in the section Optional connections, page 4. See also the CU 300 Installation and operating instructions. CU 300 automatically detects the presence of communication signals on the serial channels RS-485 or RS-232. Allow up to 40 s for communication to be established after a power up. If communication is switched from one channel to another, CU 300 must be powered off and on again. Only one channel can be in use at a time.

G100 hardware configuration

If you are not using G100 you can skip to the section Getting started, page 8.

Accessing G100 via the **Service Port** requires no changes in the hardware configuration. A communication speed of 9600 baud is the factory setting.

If you are using G100 R/M/P Port 1 to communicate with CU 300, this requires the Port 1 DIP switches on the R/M/P expansion board to be correctly set. You need to dismantle the front cover. The DIP switch is located at the edge of the circuit board close to the middle. See also the G100 Installation and operating instructions.

G100 R/M/P Port 1 DIP switch setting									
Function		**DIP switch No.**							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
IO type	**Direct ***	0	0	-	-	-	-	-	-
	Modem	1	0	-	-	-	-	-	-
	Radio	0	1	-	-	-	-	-	-
Protocol	**Auto detect ***	-	-	0	0	0	-	-	-
Speed of communication	**1200 baud**	-	-	-	-	-	0	0	0
	2400 baud	-	-	-	-	-	1	0	0
	4800 baud	-	-	-	-	-	0	1	0
	9600 baud *	-	-	-	-	-	1	1	0
	19200 baud	-	-	-	-	-	0	0	1

* Factory setting

Getting started

Locate PC Tool CU 300 in **Start | Programs | Grundfos PC Tools** and start it. The screen you will see depends on the tool setup chosen the last time the tool was started. If you have just installed the tool it has the Standard Tool Setup. This will work right away if you are using COM 1 port of your PC and your network connection is a direct RS-232 connection (fig. 1, 1a)). In this case a screen image as shown in fig. 3 will result (the number of CU 300 icons may differ from your system), and you can skip to section The Main window.

General Tool Setup

If your Operation window wrongly shows no CU 300 icons it is likely that the setup of your tool does not match your physical connection (e.g. the COM port or network connection).
Note: In some situations it may take a while (up to 40 seconds) for the tool to establish communication.
Check the setup by opening the window **File | General Tool Setup**. Select the correct connection in the 'Connection type' pull-down menu and configure it in the corresponding configuration tab. If you are using modem or G100 with modem, fill in the modem initialisation string: ATS0=1.

Digital Input can be shown either in metric units or US units, use the check box 'Show Digital input in US units' to select the preferred units. The check boxes 'Graphic interface' and 'Show hot spots' can be used to change the appearance of the user interface.

Finally click the **[OK]** button to save your tool setup to the hard disk. For all connection types, except those using a modem, communication will now be attempted and after a few seconds the icons of the connected units should appear. Consult section Fault finding if it does not work. If your network connection is a modem or G100 with modem, use **Dial up** from the Menu Bar to add phone numbers to the phone book or to make a call to the CU 300 site.
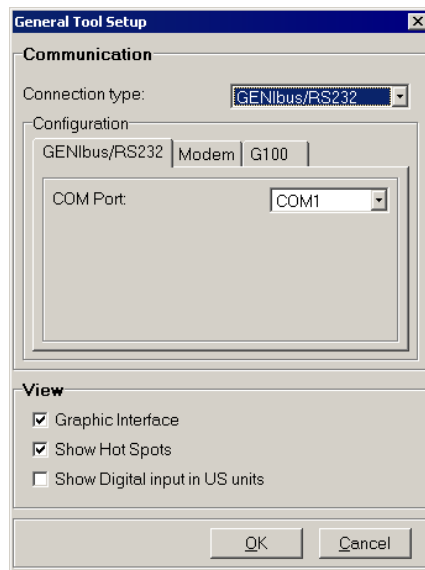

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Fig. 2 General Tool Setup window with the standard tool setup

The Main window

Introduction
We now assume that your network connection works and you are ready to take a short tour of your screen to get an explanation of what you see and what you can do. The things explained are independent of the kind of network connection you use - you can even go through this tour if you have not connected anything to the PC.

Description
The background picture is a borehole with an SQE pump, pipes, power cables and a CU 300 unit.

The picture is interactive, and the animated water flow in the picture will give you a visual feedback of the system response to your control actions. Clicking on the objects marked with arrows will open windows showing status values from the system or give you control buttons to operate the system. Interactive objects or zones in the picture are called Hot Spots. When you position the mouse pointer on top of one of them a yellow Hint Label will explain what the Hot Spot can be used for.

The Operation window is always opened automatically when the tool is started. It shows you an overview of the network connected to your PC with the connected units displayed as small icons. This is called the Network List.

The Operation window below shows a situation where the 'Connection type' is 'GENIbus/RS-232' and there are two CU 300 units connected.

The drawing of the Network List in the Operation window will show the CU 300 icons connected via a G100 icon if 'Connection type' G100 has been selected.
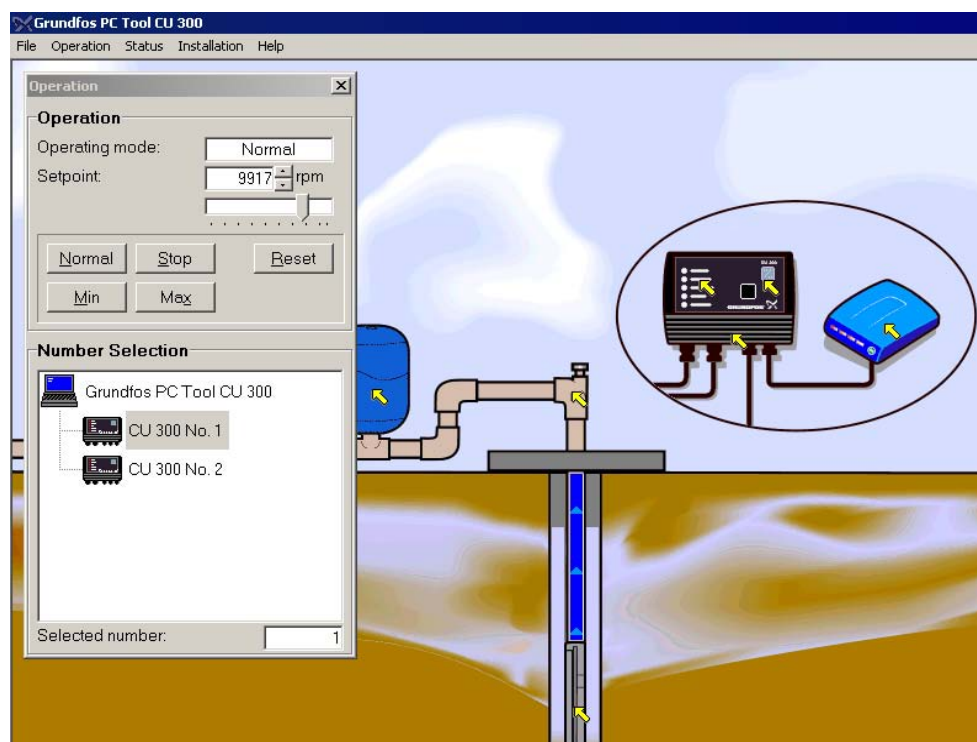

Fig. 3 Screen image example when starting the tool with the Standard Tool Setup and a connection to GENIbus. In this example two CU 300 units are connected to GENIbus

Further information
If more than one CU 300 unit is connected, which is possible using GENIbus or G100, the tool automatically picks one of them to be the Active Unit. The Active Unit is the one you interact with. You change to another unit by clicking on its icon.

At the top of the tool screen you see the Menu Bar. This bar has drop down menus which give you access to all tool windows. An overview of the complete Menu Bar contents can be seen in section Overview of tool menus, page 11.

At the bottom of the tool screen, just above the Windows Task Bar is the Status Bar. This bar shows miscellaneous status information of the tool itself and the network connection. This can often give a hint to the solution of problems if the tool is not acting as expected.

Graphic Tool Setup Having established your connection and having familiarised yourself with the main screen you are now ready to learn how to customise the tool graphics to fit your physical application.

Open **File | Graphic Tool Setup**. From this window you can select between a series of <u>standard applications</u> described in the following table and of <u>communication devices</u>. Fig. 4 shows an example where 'Filling a tank from well using level control' has been chosen as application and 'Communication device' is 'modem'.

Note: This setup is exclusively visual. It does not change anything in the way the tool works, the way CU 300 works, the way sensors are scaled etc. It is therefore possible to misfit the screen appearance to the real system behaviour (e.g. in fig. 4 a modem is shown connected to CU 300, but in the Status Bar we see that the real connection is GENIbus). If no standard application fits the real installation the three sensors can be set up individually (<u>Customer specific application</u>). All options from the Graphic Tool Setup window can be seen in the table, page 11.
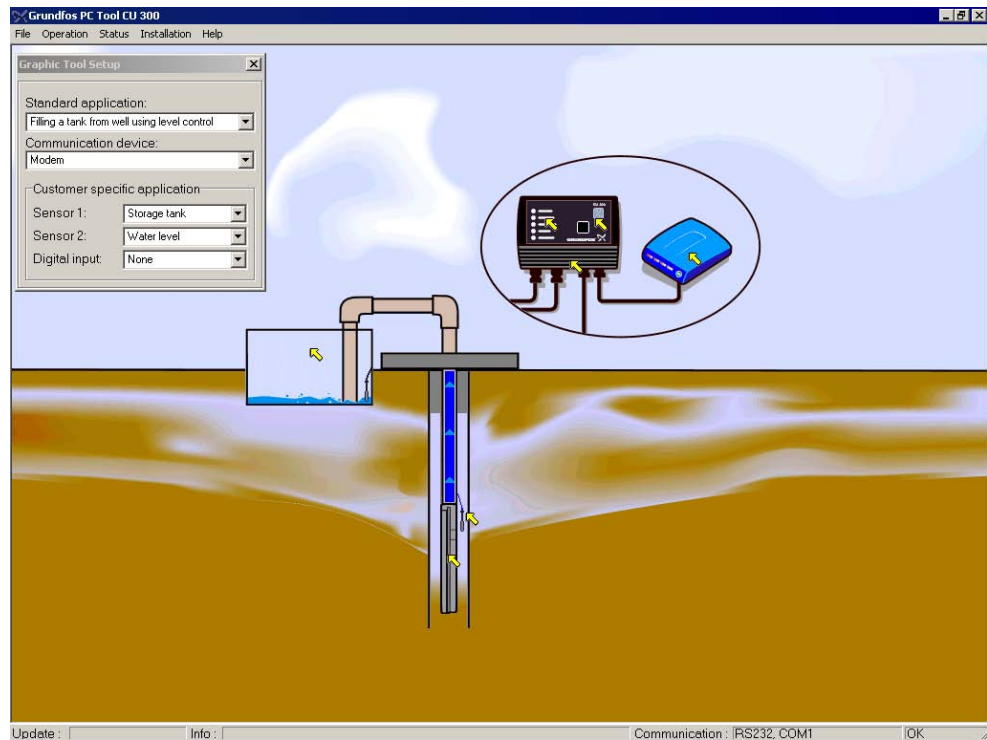

Fig. 4 The window **File | Graphic Tool Setup** for customising the graphics to the use of external sensors

**Options in the Graphic
Tool Setup window**

<table>
<tr><td colspan="4" align="center">Options in the 'Graphic Tool Setup' window</td></tr>
<tr><td rowspan="2" align="center">Standard application</td><td rowspan="2" align="center">Communication device</td><td colspan="2" align="center">Customer specific application</td></tr>
<tr><td align="center">Sensor 1 / Sensor 2</td><td align="center">Digital Input</td></tr>
<tr>
<td>
• None
• Custom specific
• Constant-pressure control
• Filling a tank using level control
• Filling a tank from well using level control
• Irrigation
• Sampling at variable speed
• Maintaining a constant water table
• System with 3 sensors connected
</td>
<td>
• None
• Modem
• G100
</td>
<td>
• None
• Pressure tank
• Storage tank
• Water level
• Top of well (pressure)
• Top of well (flow)
• External setpoint
</td>
<td>
• None
• Top of well (flow)
• Start/stop switch
• Pipeline (flow)
</td>
</tr>
</table>

Overview of tool menus

All information in the tool is available via the Menu Bar. The figure below provides an overview of the complete menu system in PC Tool CU 300.

File		Operation	Status	Installation	Dialup*)		Help
Print		Operation	Alarm Log.	General Conf.	Dialup		Help
Load Configuration	Print		Unit Info.	Sensor Conf.	Hangup	Phone book	Readme.txt
Save Configuration	Print to file		CU300 Panel	Alarm Callback Conf.		No. 1	References
General Tool Setup	Print from file		CU3 Status			No. 2	About
General Tool Setup			SQE Status			:	
Exit			Sensor 1+)				
			Sensor 2+)				
			Digital Input+)				

Fig. 5   The tool menus

  *) This menu column is only present if the Connection type is 'Modem' or 'G100 with modem'.

  +) This menu item is dimmed if the corresponding sensor has not been selected in
     File | Graphic Tool Setup.

CU 300 operation and status reading

Introduction

In this section we will take a tour of the interactive background.

All status windows from the interactive background continuously refreshes their content, making it possible to dynamically follow changes in values.

The Operation window

You open this window by clicking on the on/off button of the CU 300 in the picture or by selecting **Operation | Operation** from the Menu Bar. This window is always opened automatically when the tool is started, see fig. 3.

Using the command buttons **[Normal]**, **[Stop]**, **[Min]** and **[Max]** in this window you can manually change the mode of operation of the pump. It has the same result as using the equivalent commands from R100.

Using the **[Reset]** button you can manually acknowledge alarms and make the CU 300 attempt a restart of the pump. It has the same result as acknowledging an alarm by pressing the on/off button on the CU 300 or using the Reset command from R100.

The setpoint can be adjusted with the up/down arrow or by pulling the slider with the mouse. The setpoint is a speed setpoint, measured in rpm, if CU 300 operates in Control mode 'Open loop'. If CU 300 operates in Control mode 'Closed loop', the setpoint is measured in the same unit as sensor 1.

In the Network List, use the mouse to select which CU 300 you communicate with by clicking on its icon. Once selected, all data you see in the different windows belong to this CU 300. Selecting a new CU 300 will make all status windows which are opened refresh their content with data from the new unit in a few seconds, and all installation windows will close automatically.

If a CU 300 has an alarm, this will be shown with a red frame around the CU 300 icon. The cause of the alarm condition can be found in the CU 300 Status window (see The CU 300 Status window, page 13).

The SQE Status window

Open this window by clicking on the submersed SQE pump in the picture or by selecting **Status | SQE Status** from the Menu Bar. Below is a table describing all the Data Items which are displayed in this window. Like all status windows the values are continuously updated.

Data Item	Description	Range	Accuracy *)
Speed	Speed of the pump	[7000; 10700 rpm]	1%
Temperature	Temperature of the SQE power electronics	[−16; 138 °C]	5°C
Power input	Power	[0; 2500 W]	5%
Power consumption	Energy	[0; 130,000 kWh]	5% of the actual value
Operating hours	No. of hours the pump has been running	130558 h	+/- 2h
No. of starts (power up)	No. of times the pump has been powered up	16,650,000	+/- 1
No. of starts (start/stop)	No. of times the pump has been stopped and started	16,650,000	+/- 1

*) Percentage specifications are related to full range unless otherwise stated.

The CU 300 Status window

Open this window by clicking in the bottom area of the CU 300 in the picture or by selecting **Status | CU 300 Status** from the Menu Bar. Below is a table describing all the data items which are displayed in this window. Like all status windows the values are continuously updated.

Data Item	Description	Range	Accuracy *)
Operating Mode	Mode of operation	Normal, Stop, Min., Max.	-
From	Source of operating mode	GENIbus, GENIlink, sensor	-
Setpoint	Commanded Setpoint (GENIbus or R100)	Open loop: [7000; 10700 rpm] Closed loop: [sensor range]	0.5%
External setpoint	Setpoint attenuation from external analogue input	[0; 100%]	0.5%
Actual setpoint	Resulting actual setpoint	Open loop: [7000; 10700 rpm] Closed loop: [sensor range]	1%
Alarm	Actual alarm	-	-
Warning	Actual warning	-	-

*) Percentage specifications are related to full range unless otherwise stated.

The sensor windows

The sensor windows are only active if the corresponding sensor has been selected in **File | Graphic Tool Setup**. The active sensors are marked with a yellow Hot Spot arrow and the sensor windows can be opened by clicking on the arrow or via the Status Menu in the Menu Bar.

The sensor value is scaled according to the sensor configuration in the window **Installation | Sensor Configuration**.

If 'Signal type' is chosen to be 'No sensor' for the sensor in question (digital sensor chosen to be 'off') then a dash '-' is shown in the corresponding sensor window.

The accuracy of a sensor input is +/- 2 %.

The CU 300 Panel window

You open this window by clicking on the upper left corner of the CU 300 or by selecting **Status | CU 300 Panel** from the Menu Bar. The window shows the CU 300 panel with text and status diodes. The state of the diodes is an image of their actual state (off/on/flashing) on the real CU 300.
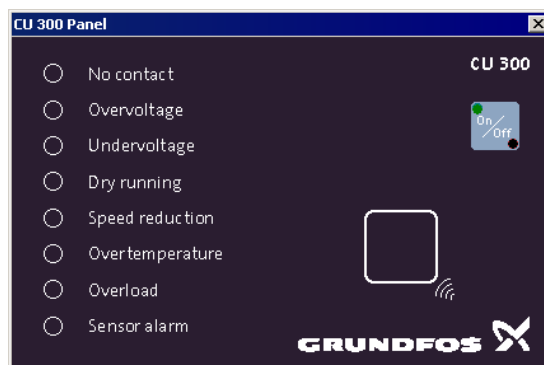

Fig. 6 The CU 300 Panel window

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The Alarm Log window

You can only open this window by selecting **Status | Alarm Log** from the Menu Bar. All alarms are divided in two categories, those related to the SQE pump and those related to the CU 300 unit. The total number of occurred alarms for the different alarm types in each category is recorded.

Below the total alarm number is an alarm log of the 5 last occurred alarms from each category shown with a time stamp. When a new alarm different from the latest alarm arrives to this alarm log it will push all the previous alarms one position down. Logged alarm No. 5 will be pushed out.

Clicking on the **[Details]** button for an alarm will give an explanation to the alarm, its possible cause and remedy.
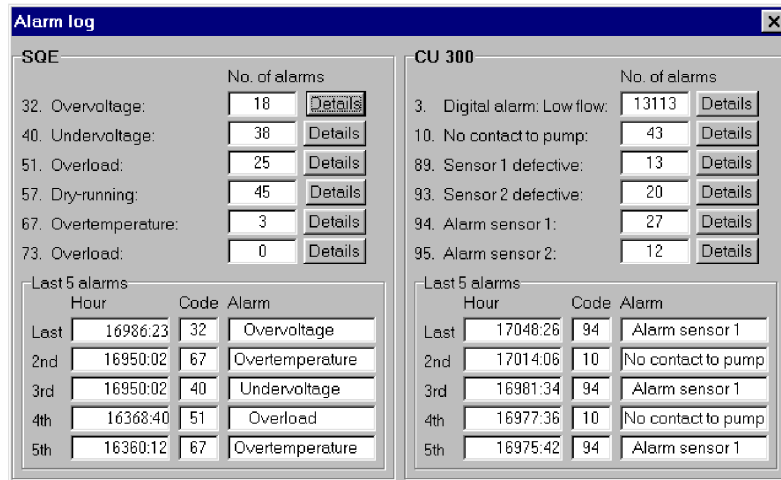
The Alarm Log cannot be cleared.

Fig. 7 The Alarm Log window

The CU 300 Unit Information window

Open this window by selecting **Status | CU 300 Unit Information**, or by double clicking on the selected CU 300 icon in the Operation window Network List. In the 'Information' field, a series of text strings which are read from the CU 300, and which describe the unit, will be displayed. In the 'User defined information' field, the operator can name each installation ('Name' field) and make a short description of it ('Comments' field). Both texts will be saved in the PC and tagged to the No. of the selected CU 300.

The text written in the 'Name' field will be added to the icon text in the Operation window Network List.
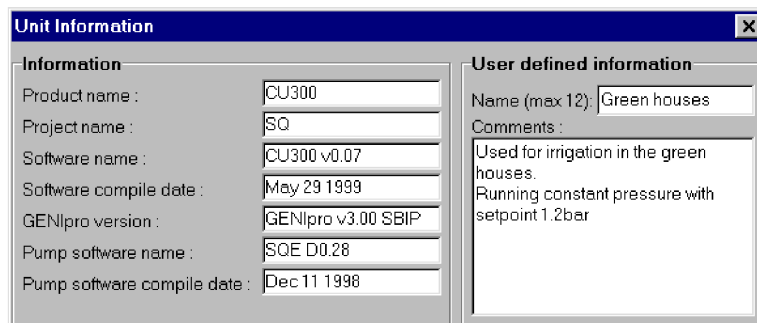

Fig. 8 The CU 300 Unit Information window

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CU 300 installation configuration

Introduction   The configuration windows are updated with the actual values from the selected CU 300 the moment they are opened. Contrary to Status windows, open configuration windows are not updated dynamically as this would prevent the user from keying in new configuration values. If another unit is selected from the Operation window Network List while a configuration window is open, this configuration window will be closed. Common to all three configuration windows are also the **[Program]** button in the lower right-hand corner. Pressing it will start programming the selected CU 300 with the values in the window. During this process a progress bar will be shown on the screen, and if no warning shows up, the programming will be completed successfully.

The General Configuration window   Open this window by selecting **Installation | General Configuration** from the Menu Bar. Below is a table of all the configuration parameters which can be programmed via this window. All these parameters can also be read or programmed via R100.

Configuration parameter	Value range	Factory setting	Description
Miscellaneous			
Control mode	Open Loop, Closed loop	Open loop	**Open loop:** Setpoint is the pump speed. **Closed loop:** CU 300 closed loop control tries to bring the feedback (sensor 1) in accordance with the setpoint.
Buttons on CU 300	Active, Not active	Active	The on/off button on CU 300 can be active or not active.
Dry-running stop	Enable, Disable [0; 2461 W]	Enable 0 W	The dry-run protection uses a minimum power limit to detect dry-runing.
Warning temperature	[0; 65/85°C]	-	If temperature in power electronics exceeds this temperature the alarm relay will be activated.
Start delay	[0; 60 s]	0 s	Delay from SQE is powered on until it starts.
Maximum speed	[7000; 10700 rpm]	10700 rpm	Upper speed limit.
Number	[1; 64]	-	GENIbus No. as programmed with R100.
Standby			
Auto restart	Enable, Disable [0:00; 4:00] h:min	0:05 h:min	Automatic restart after an alarm stop. The alarm standby time can be programmed.
Repeated standby time doubling	Enable, Disable	Disable	Alarm standby time is doubled after every 10 alarm stops until 4:00 is reached. Will be reset after 10 h without alarms.
Dewatering			
Dewater	Enable, Disable	Disable	Enables or disables the CU 300 dewatering function which is based on the dry-running detection.
Max. Run Time	[1; 60 min]	60 min	Run time according to the Run/Stop diagram.
Max. Stop Time	[1; 60 min]	60 min	Current or voltage offset in the sensor signal (e.g. 4-20 mA).

The Sensor Configuration window   Open this window by selecting **Installation | Sensor Configuration** from the Menu Bar. The following table shows all the configuration parameters which can be programmed via this window. All these parameters can also be read or programmed via R100

Configuration parameter	Value range	Factory setting	Description
Sensor 1			
Signal type	No sensor, 0-20 mA, 4-20 mA, 0-10 V, 2-10 V	No sensor	Type of electrical signal from sensor.
Unit	m, m³/h, feet, gpm, %	m	Unit of sensor value.
Max. sensor value	[1; 250]	1	Sensor maximum value.
Min. sensor value	[0; 249]	0	Sensor minimum value (offset from zero).
Limits			
Max. stop		Max.	Sensor maximum (high) limit for start/stop control.
Max. warning		Min.	Sensor maximum (high) limit for warning.
Max. alarm	Enable, Disable [Min sensor value; Max sensor value]	Max.	Sensor maximum (high) limit for alarm, pump will be stopped.
Min. stop		Min.	Sensor minimum (low) limit for start/stop control.
Min. warning		Max.	Sensor minimum (low) limit for warning.
Min. alarm		Min.	Sensor minimum (low) limit for alarm, pump will be stopped.
Stop type	Fill, Empty	Fill	**Fill:** pump stops at high limit and starts at low limit **Empty:** pump starts at high limit and stops at low limit
Sensor 2			
External setpoint	Enable, Disable	Disable	Sensor signal used as external analogue setpoint.
Signal type	No sensor, 0-20 mA, 4-20 mA, 0-10 V, 2-10 V, SPP 1	No sensor	Type of electrical signal from sensor.
Unit	m, m³/h, feet, gpm, %	m	Unit of sensor value.
Max. sensor value	[1; 250]	1	Sensor maximum value.
Min. sensor value	[0; 249]	0	Sensor minimum value (offset from zero).
Limits			
Max. stop		Max.	Sensor maximum (high) limit for start/stop control.
Max. warning		Min.	Sensor maximum (high) limit for warning.
Max. alarm	Enable, Disable [Min sensor value; Max sensor value]	Max.	Sensor maximum (high) limit for alarm, pump will be stopped.
Min. stop		Min.	Sensor minimum (low) limit for start/stop control.
Min. warning		Max.	Sensor minimum (low) limit for warning.
Min. alarm		Min.	Sensor minimum (low) limit for alarm, pump will be stopped.
Stop type	Fill, Empty	Fill	**Fill:** Pump stops at high limit and starts at low limit. **Empty:** Pump starts at high limit and stops at low limit.
Digital input			
Function	Off, Stop, Start, Flow	Off	Function of the external digital input.
Flow	[0; 100 l/pulse], [0;26,4 Gal/pulse]	0 l/pulse	Scaling digital input for flow measurement.
Accumulated flow			
Sensor	None, Sensor 1, Sensor 2, Digital	None	Signal source for calculation of accumulated flow (pumped volume).
Max. Run Time	Enable, Disable [0; 1000 m³], [0;264200 gallons]	Disable 0 m³.	Stop of pump when defined volume is pumped.

The Alarm Call-back Configuration window

Open this window by selecting **Installation | Alarm Call-back Configuration** from the Menu Bar. Below is a table of all the configuration parameters which can be programmed via this window. None of these parameters can be read or programmed via R100 or via G100.

Configuration parameter		Value range	Factory setting	Description
Call-back	Call-back enabled	Enable, Disable	Disable	Enables the call-back function upon alarms. A modem must be connected.
	No. of alarms before call-back	[1; 10]	10	CU 300 will make a call-back when this number of alarms has occurred in 24 hours.
Phone numbers	First phone No.	Phone No. Voice *), Data	- Data	e.g. 004586684444w5942
	Second phone No.	Phone No. Voice *), Data	- Data	
Call-back on alarm	No contact	Enable, Disable	Disable	It is possible to individually enable/disable the call-back function for each alarm.
	Overvoltage			
	Undervoltage			
	Dryrunning			
	Overtemperature			
	Overload			
	Sensor alarm			

*) Requires a voice modem connected to CU 300

Loading and saving a configuration

From the menu item **File | Load Configuration** it is possible to load a complete configuration from a file and program this configuration to a CU 300. In this way it is very easy to program many CU 300 units with exactly the same set of parameters.
File | Load Configuration will display the Windows 'Open' dialogue box prompting you to select a file.
The default catalogue is **C:\program files\Grundfos\PC Tool CU 300\data** and all files of type *.cnf will be displayed. The file factory.cnf, which is installed in this catalogue contains the CU 300 factory configuration. You can select it or any other *.cnf file and click **[Open]**. The Load Configuration window below will be displayed.
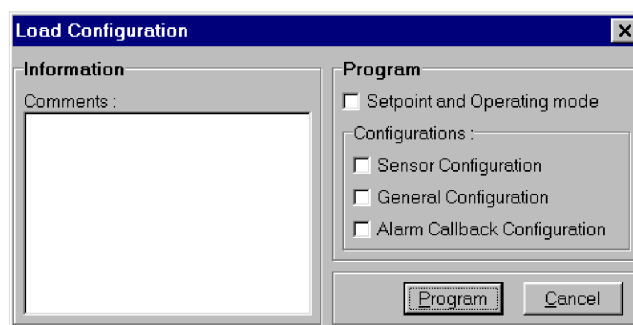

Fig. 9 The **File | Load Configuration** window

In the 'Comments' field a text explains details of the selected file (if such information was saved with the file). With the check boxes, different parts of the configuration file can be selected. These parts are equal to the contents of settings from the Operation window and the three configuration windows.
Select the parts you would like to program and click **[Program]**.
You can also do the opposite, save the configuration of a CU 300 unit to a file. You connect the tool to the CU 300 and select it in the Operation window Network List (if it is the only unit connected, the tool will select it automatically). Then click **File | Save Configuration** which will open the Save Configuration window. You are invited to write a comment. Then click **[Save]** and the Windows 'Save As' dialogue box will be prompting you to select a catalogue and a filename for saving the configuration.
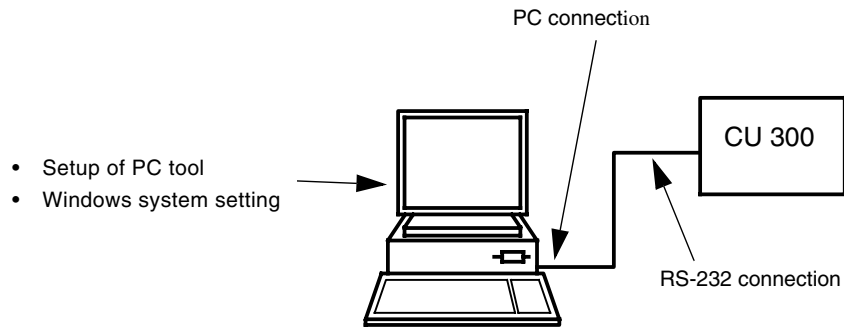
Fault finding

Communication with a CU 300 via RS-232 directly

Fig. 10 shows the situation where PC Tool CU 300 communicates with a CU 300 unit via its RS-232 connection.

If you do not see the correct image of your network in the Operation window i.e. one CU 300, then go through the following check table.
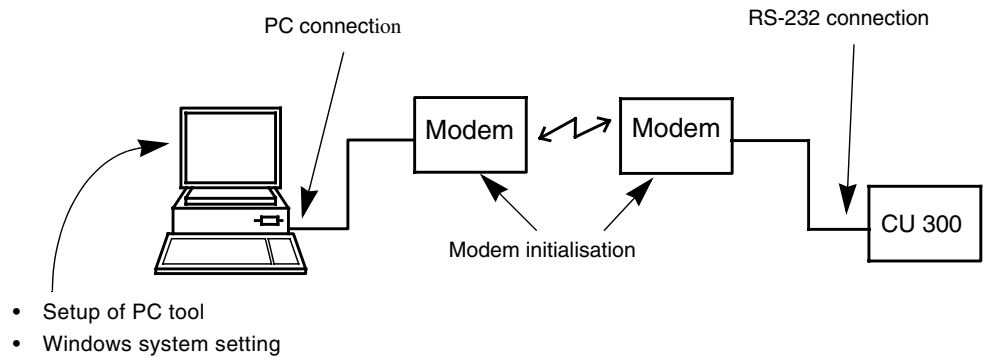

Fig. 10 PC connected directly to CU 300 RS-232 terminals. The arrows indicate typical causes of communication problems

Check table for RS-232 connection	
CU 300	Be sure that the CU 300 unit is switched on
RS-232 connection	• The cable wires must be connected to the right terminals on the CU 300 unit.The TxD connection on the included CU 300 RS-232 cable is marked black. • Check for short circuits at the connections. • Check that the cable is not damaged and that cable connections (if any) are sound. • Check that the cable has been made according to the description, see Wiring specification for the different cable connections, page 5.
PC connection	At the back of the PC check to which COM port you have connected the adapter, and that it is properly fixed.
PC tool setup	In **File I General Tool Setup** check that you are using GENI-bus/RS-232 'Connection type' and the right COM port.
Windows	• Check in Windows system setting that your COM port is not disabled or configured to a special use. • Check that there is not another active program on the PC using the same COM port.

Communication with a CU 300 via modem

Fig. 11 shows the situation where PC Tool CU 300 communicates with a CU 300 unit via a modem.

If you do not see the correct image of your network in the Operation window, i.e. one CU 300 unit, then go through the following check table.


Fig. 11 PC connected to CU 300 RS-232 terminals via a modem. The arrows indicate typical causes of communication problems.

Check table for modem connection	
CU 300	Be sure that the CU 300 unit is switched on.
RS-232 Connection	• The cable wires must be connected to the right terminals on the CU 300 unit. • Check for short circuits at the connections. • Check that the cable is not damaged and that cable connections (if any) are sound. • Check that the cable has been made according to the description, see Wiring specification for the different cable connections, page 5.
PC Connection	Check the modem are connected to the pc correctly.
Modem	• Be sure that the modems are switched on. • Check to see if the modem line works proberly.
PC Tool Setup	In **File	General Tool Setup** check that you are using modem 'Connection type' and the right modem from the list.
Windows	• Check in Windows system setting that your COM port is not disabled or configured to a special use. • Be sure that the right driver for the modem is installed. A standard Windows driver will not work. • Check that there is not another active program on the PC using the same COM port.

Communication with a CU 300 Network via GENIbus

Fig. 12 shows the situation where PC Tool CU 300 communicates with a GENIbus network consisting of two CU 300 units. It might be that your application is different. However the procedure in checking the system is general.
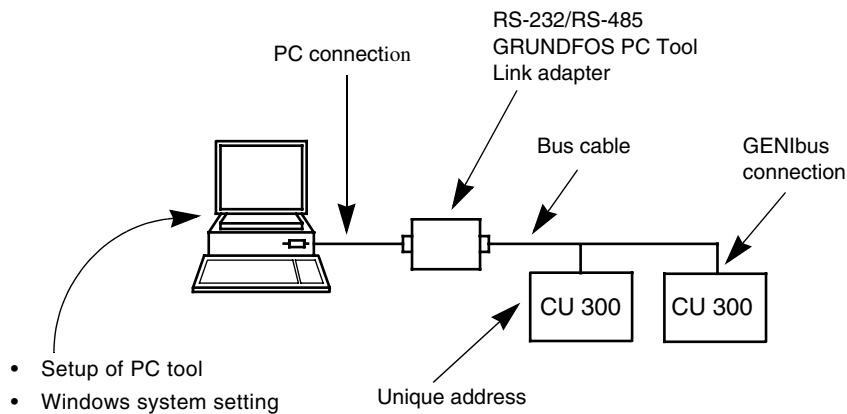
Fig. 12 GENIbus network example. The arrows indicate typical causes of communication problems.

If you do not see the correct image of your network in the Operation window - one or more units might be missing, units appear and disappear or you might not see any units at all - then go through the following checks.

Check table for GENIbus connection	
CU 300	• Be sure that the CU 300 units are all switched on. • Be sure that each CU 300 unit has a unique address (e.g. number programmed with R100 or with the tool).
GENIbus connection	• The bus cable must be connected to the right terminals on the CU 300 unit. The signal wires to A and B and the screen to Y. Check that the connection to A and B are not reversed. • Check for short circuits at the connections. • Check that the cable is not damaged and that cable connections (if any) are sound. Try to make ohmic measurements.
RS-232/RS-485 GRUNDFOS PC Tool Link adapter	Study the PC Tool Link instructions.
PC Connection	• At the back of the PC, check to which COM port you have connected the adapter to and that it is properly fixed.
PC Tool Setup	• In **File** I **General Tool Setup** check that you are using GENIbus/RS-232 'Connection type' and the right COM port.
Windows	• Check in Windows system setting that the COM port you use is not disabled or configured to a special use. • Check that there is not another active program on the PC using the same COM port.

Communication with a CU 300 network via G100

The table below describes some of the most common problems when trying to establish communication between PC Tool CU 300 and the gateway G100. Parts of this fault finding procedure will make use of **PC Tool G100**.

Connection to G100		Fault indication	Cause and remedy
Connection to service port	**Direct access**	G100 icon is red, and the Status Bar reads: 'Error'.	No communication between PC and G100. Check that... • the cable is correct (standard 0-modem cable), • you are using the correct COM port in your PC, • the baud rate selection in the PC tool is 9600.
	Access via modem	Modem connection cannot be established.	G100 modem is not properly connected to telephone line, or G100 modem is not in auto answer mode. • Check that the cable between G100 and modem is correct (standard modem cable = all pins straight through). • To activate auto answer mode, use a terminal program (e.g. Procomm) to send the following AT-command: "AT&D0".
		Modem connection has been established but the G100 icon turns red and the Status Bar reads: 'Error'.	No communication between PC and G100. This could be due to a bad telephone line. • Hang up and try again. If this does not help, check that... • the cable between G100 and modem is correct (standard modem cable = all pins straight through), • the modem can work without DTR being present. Use a terminal program (e.g. Procomm) to send the following AT-command: "AT&D0".
Connection to R/M/P version, port 1	**Direct access**	G100 icon is red, and the Status Bar reads: 'Error'.	No communication between PC and G100. Check that... • the cable is correct (standard 0-modem cable), • you are using the correct COM port in your PC, in the window **File | Tool Setup | General Setup** • the baud rate selected in the window **File | Tool Setup | General Setup** matches the hardware selection on the Radio/Modem/PLC board, • the I/O type on the Radio/Modem/PLC board is set to 'Direct'.
	Access via modem	Modem connection cannot be established.	G100 modem is not properly connected to the telephone line, or G100 modem is not in auto answer mode. • Check that the cable between G100 and modem is correct. Standard modem cable = all pins straight through). If the I/O type on R/M/P board is set to 'Modem', G100 itself is able to initialise the modem. The initialisation string can be set up from PC Tool G100 in the following way: • Connect the PC to G100 Service port and start PC Tool G100. • Click the G100 icon. • Select the **[R/M/P board...]** button. • Select the **[Alarm setup...]** button. • In the Modem initialisation field write: 'ATS0=1'. • Close the menu with **[OK]**. • Confirm writing data to G100 with **[Yes]**. • Exit PC Tool G100 and switch off/on G100 to initialise modem.
		Modem connection has been established but after a while the G100 icon turns red and the Status Bar shows: 'Error'	No communication between PC and G100. This could be due to a bad telephone line. Hang up and try again. **NOTE:** After 8 hours, G100 will by itself terminate a modem communication.
	Access via radio	The G100 icon is red and the Status Bar reads: 'Error'	No communication between PC and G100. Check that... • the cable is correct (consult your radio user manual and G100 Product Information to match the pin connections) • you are using the correct COM port in your PC and • the baud rate selected in the PC tool matches the dip switch selection on R/M/P board and • the I/O type on R/M/P board is set to 'Radio' ('Direct' if your radio operates in transparent mode).

(Table to be continued on the next page)

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(Table continued)

Connection to G100		Fault indication	Cause and remedy
Connection to service port	**Direct access**	G100 icon is red, and the Status Bar reads: 'Error'.	No communication between PC and G100. Check that... • the cable is correct (standard 0-modem cable), • you are using the correct COM port in your PC, the baud rate selection in the PC tool is 9600.
	Access via modem	Modem connection cannot be established.	G100 modem is not properly connected to the telephone line, or G100 modem is not in auto answer mode. • Check that the cable between G100 and modem is correct (standard modem cable = all pins straight through). • To activate auto answer mode, use a terminal program (e.g. pro-comm) to send the following AT-command: 'ATSO=1'.
		Modem connection has been established but the G100 icon turns red and the Status Bar reads: 'Error'.	No communication between PC and G100. This could be due to a bad telephone line. • Hang up and try again. If this does not help, check that... • the modem can work without DTR being present. Use a terminal program (e.g. Procomm) to send the following AT-command: 'AT&D0'.
Common to all connections		The communication between PC tool and G100 seems to be OK. Several CU 300 units are connected to G100, but none or only some are shown in the PC tool.	No communication is taking place between G100 and the CU 300 units. • Check that the connection between G100 GENIbus port and GENIbus is correct (see G100 Installation and operating instructions). • Go through the checks of bus units, GENIbus connections and GENIbus cable as described in preceding section.

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