

ComTool

Tool for managing parametric controllers

CAREL



User manual



I n t e g r a t e d C o n t r o l S o l u t i o n s & E n e r g y S a v i n g s

Contents

1. PRESENTATION.....	5
2. MINIMUM SYSTEM REQUIREMENTS	5
3. CONTROLLERS MANAGED BY COMTOOL.....	5
4. INSTALLATION.....	7
5. LOGIN	8
6. MAIN SCREEN AND FUNCTION BUTTONS	9
6.1 Main menu.....	10
6.2 Function buttons	10
6.3 Parameter database table.....	10
6.4 Area selezione indirizzi	11
6.5 Groups frame.....	11
6.6 Controllers frame	11
6.7 Tabella sinottica del dispositivo.....	11
6.8 Timer.....	12
6.9 Parameter filter buttons.....	12
6.10 Image of the device	12
6.11 Graph function buttons.....	12
6.12 Tool buttons.....	12
6.13 Controller data.....	13
6.14 Status bar	13
7. PC - DEVICE CONNECTION	14
8. PC - DEVICE COMMUNICATION	15
9. AUTOMATIC DEVICE SEARCH.....	16
10. TUTORIAL.....	17
 Setting an individual parameter on a device	17
 Setting a series of parameters for a device and save to .xls file	19
 Programming a device using a configuration file.....	20
 Comparing device parameter against a configuration file.....	21
 Creating a new user and managing access privileges	21
 Creating a graph of variable values.....	23
 Using a Customised Database.....	25
11. INFORMATION ON COMTOOL - Support	29

IMPORTANT WARNINGS



BEFORE INSTALLING OR HANDLING THE DEVICE PLEASE CAREFULLY READ AND FOLLOW THE INSTRUCTIONS DESCRIBED IN THIS MANUAL.

The device that this software is dedicated to has been developed to operate risk-free and for a specific purpose, as long as: the software is installed, programmed, run and maintained according to the instructions in this manual and by qualified personnel; all the conditions prescribed in the installation and user manual of the appliance in question are observed.

All other uses and modifications made to the device that are not authorised by the manufacturer are considered improper. Liability for injury or damage caused by the incorrect use of the device lies exclusively with the user.

1. PRESENTATION

ComTool is the new software developed by CAREL for managing parametric controllers.

With a simple and intuitive user interface, ComTool allows the complete configuration of the parameters available to the supervisor on a wide range of CAREL devices.

The software can also be used to manage the parameters directly from a PC, using Microsoft® Excel spreadsheets, and to simulate various tests by displaying, and where necessary saving, graphs of the variables.

2. MINIMUM SYSTEM REQUIREMENTS

Hardware requirements:

- Processor: Pentium 4, 3.0 GHz (or equivalent) or higher.
- RAM: 1 GB.
- Hard disk fixed: at least 400 MB free space.
- One free USB port for the converter.

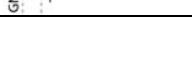
Software requirements:

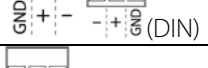
- Operating system: Microsoft® Windows® XP Professional SP2, Windows® Vista.
- Browser: Internet Explorer 6.0 or higher.
- Microsoft® Office 2002 or higher.
- Adobe® Acrobat Reader® version 5.0 or higher.

IMPORTANT: the system must be accessed using the administrator account on the computer to correctly install the software.

3. CONTROLLERS MANAGED BY COMTOOL

ComTool can manage the parameters on the controllers shown in the table below.

Device	Serial card code	Firmware	Manual code	Type of terminal
E-Drofan	HYSC00F0P0	3.5	+030221265 (ITA) +030221266 (ENG)	
uC Compact	MCHSMLSER0	2.0	+030221870 (ITA/ENG)	
uC2	MCH2004850 FCSER00000 (DIN)	1.9	+030220730 (ITA) +030220731 (ENG)	
uC2 SE	MCH2004850	1.9	+030220425 (ITA) +030220426 (ENG)	
uGeo	MCH2004850	1.2	+030220830 (ITA) +030220831 (ENG)	
uAC	MAC2SER000	1.7	+030220400 (ITA/ENG)	
Clima	IROPZ48500	2.7	+030220640 (ITA) +030220641 (ENG)	
Master Aria	HYSC00F0P0	1.2	+030220480 (ITA) +030220481 (ENG)	
IR33	IROPZ48500 IROPZSER30 (DIN)	3.3	+030220440 (ITA) +030220441 (ENG)	
IR33 Universal	IROPZ48500 IROPZSER30 (DIN)	1.4 (2.0)	+030220800 (ITA) +030220801 (ENG)	
IR32	IR32SER00E IRDRSER00E + TCONN60000 (DIN)	4.0	+030220170 (ITA/ENG)	
MPX	Direct connection only for versions with serial option	2.2	+030220190 (ITA) +030220191 (ENG)	

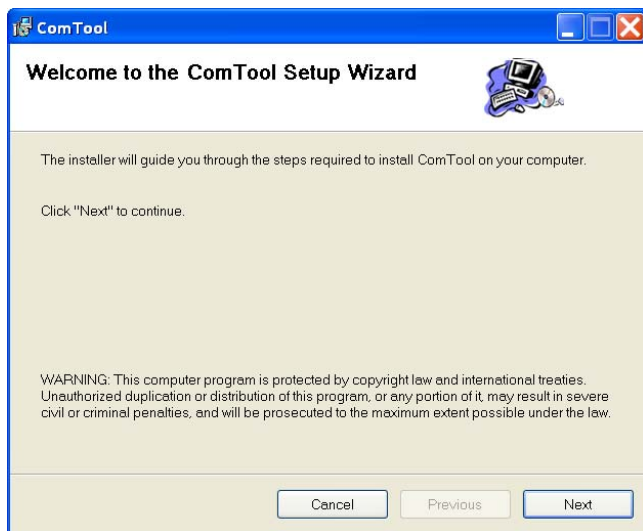
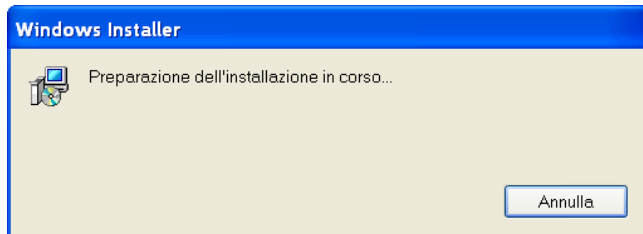
MPX PRO	Direct connection (Master) MX2OP48500 (Slave)	2.6	+030220185 (ITA) +030220186 (ENG)	
uRack	MCH2004850 FCSER00000 (DIN)	2.0	+03P220430 (ITA) +03P220431 (ENG)	
Easy	IROPZ48500	1.9	+030220790 (ITA) +030220791 (ENG)	
Easy compact	IROPZ48500	1.3	+030220790 (ITA) +030220791 (ENG)	
PowerCompact	IROPZ485000	3.3	+030220370 (ITA) +030220371 (ENG)	
MasterCella	IROPZSEM10	3.3	+030220470 (ITA) +030220472 (ENG)	
MasterCella Compact	MTCSE00000	5.1	+030221395 (ITA/ENG)	
IR32 Universal	IR32SER00E IRDRSER00E + TCONN60000 (DIN)	3.1	+030220160 (ITA/ENG)	
FCP	FCSER00000	1.2	+030220390 (ITA) +030220391 (ENG)	
(*) EVD_400	CVSTDUTTLO	6.0	+030220225 (ITA) +030220227 (ENG)	Direct connection to service port
(*) EVD_400 – MCH2	CVSTDUTTLO	6.0	+030220225 (ITA) +030220227 (ENG)	Direct connection to service port
(*) EVD_400 – StandAlone	CVSTDUTTLO	6.0	+030220225 (ITA) +030220227 (ENG)	Direct connection to service port
(*) EVD_400 – Positioner	CVSTDUTTLO	6.0	+030220225 (ITA) +030220227 (ENG)	Direct connection to service port
EVD_300	Direct connection	4.3	+030220205 (ITA/ENG)	
Clima ADCF*610	IROPZ48500	1.0	+ 030220640 (ITA) + 030220641 (ENG)	
Chiller Process	MCH2004850	1.0	+ 030220415 (ITA) + 030220416 (ENG)	
EVO	Direct connection	3.3	+0300005IT (ITA) +0300005EN (ENG)	
EVO Twin	Direct connection	3.3	+0300006IT (ITA) +0300006EN (ENG)	
I/O Module	Direct connection	1.6	+ 030220240 (ITA) + 030220241 (ENG)	
ACC	FCSER00000	1.1	+ 030220750 (ITA) + 030220751 (ENG)	
PJ32	PJOPZ48500	1.1	+ 030221880 (ITA) + 030221881 (ENG)	
CPY	Direct connection	8.3	+ 040000030 (ITA/ENG)	



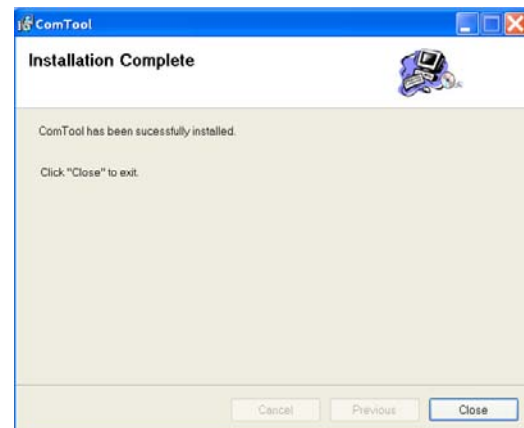
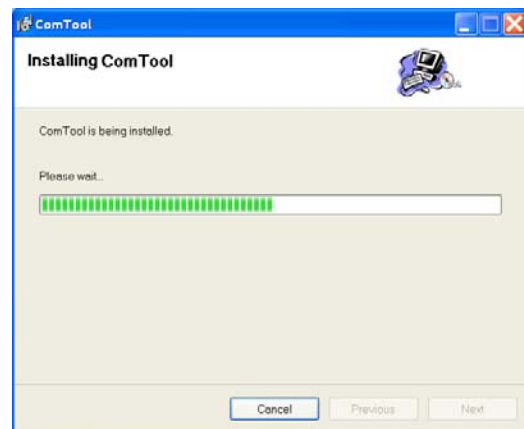
(*) The optional serial card is not required for programming the EVD_400 as a service port is available, accessed using the converter code CVSTDUTTLO. In this case, TTL MODE needs to be selected under the COMMUNICATION settings. To simplify the parameter settings, these have been divided into three groups, represented by the virtual codes "EVD_400 – MCH2", "EVD_400 – StandAlone" and "EVD_400 – Positioner" (each group only includes the parameters required for the specific application).

4. INSTALLATION

After having downloaded the zipped ComTool directory from <http://ksa.carel.com> and unzipped it, click the ComTool software installation file to start the guided process.

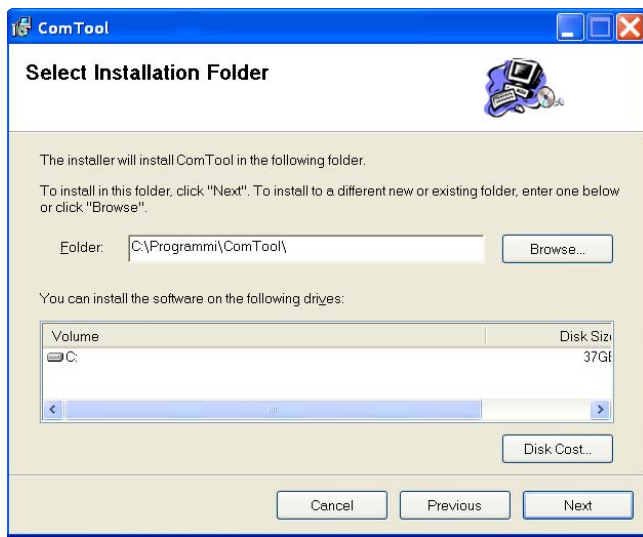


...the installation program now prompts for confirmation before proceeding...



...the software is automatically installed and a shortcut to ComTool.exe is created on the desktop and in the program menu.

The following window is used to select the directory where the ComTool software will be installed; after having chosen the program installation path, press the NEXT button to continue...



5. LOGIN

Whenever ComTool is run, an opening screen is displayed (as shown in the figure below).
To access the program, correctly complete the USER, PASSWORD and PROFILE fields, based on the settings.



*For first access, when the user and password have not yet been set, enter the “admin” as the USER, select **Profile1** in the **Profile** field and type “1234” as the PASSWORD.*

Then the menu can be accessed to configure different levels of users with different access rights.



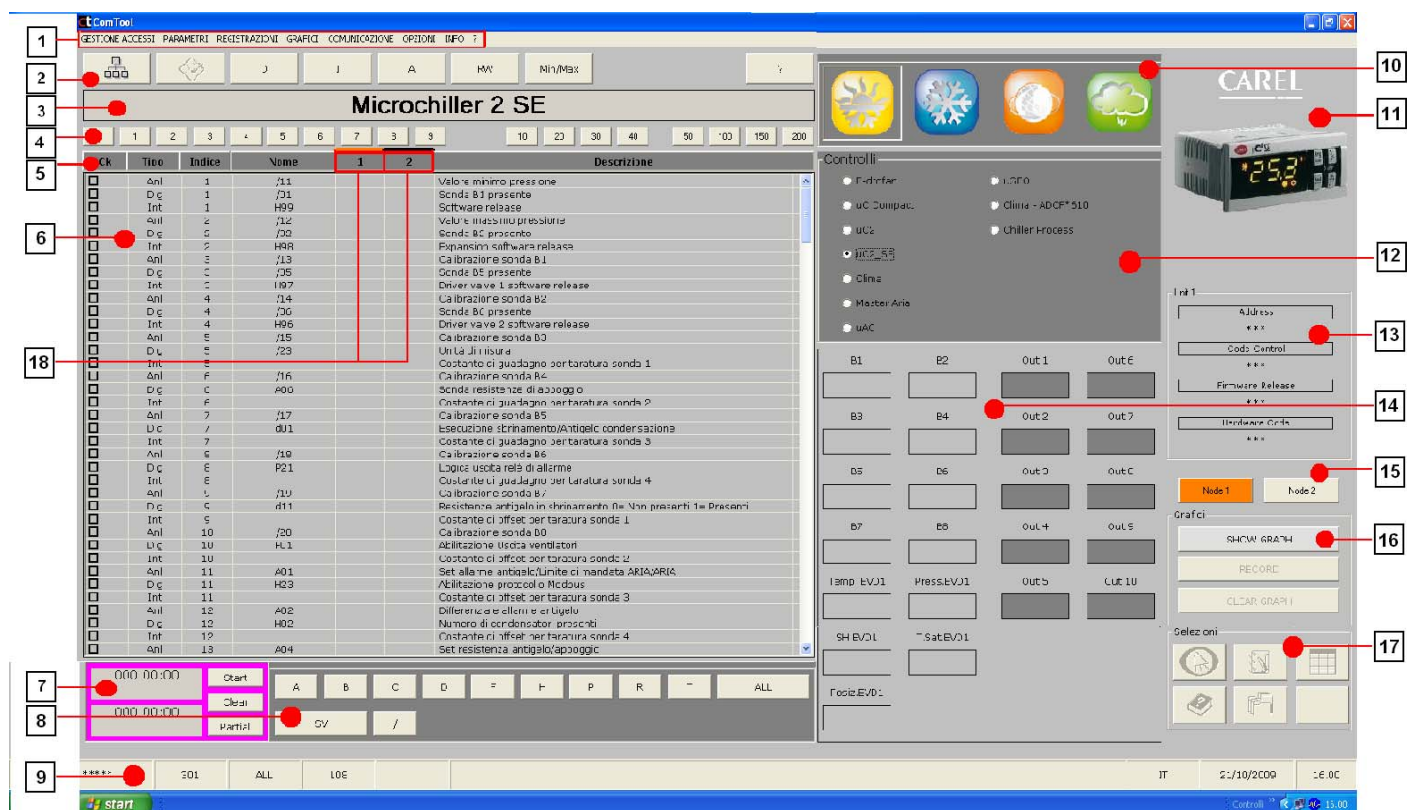
*The **DIRECT ACCESS** button is used to directly access COMTOOL without logging in as a predefined user, that is, without entering the username, password and choosing the profile*

*The **DIRECT ACCESS** button is not available when first running COMTOOL.*

*The button can be made available by enabling the function under the **ACCESS MANAGEMENT** menu / **DIRECT ACCESS***

6. MAIN SCREEN AND FUNCTION BUTTONS

After having logged in, the following screen is displayed in ComTool:



Key

1	Main menu
2	Function buttons
3	Controller name and description
4	Selection area and address display
5	Buttons for sorting columns in the table
6	Table of device parameters
7	Timer
8	Parameter filter buttons
9	Status bar
10	Controller groups
11	Image of the controller
12	List of controllers by groups
13	Controller data
14	Layout area
15	Change layout selection
16	Graph management area
17	Selection buttons
18	Addresses of units connected (displayed)

6.1 Main menu

Used to access the following functions:

ACCESS MANAGEMENT

- User configuration
- Access configuration
- Load profile
- Direct access
- Exit

PARAMETERS

- Open parameter file
- Download parameters
- Download RW parameters
- Download CK parameters
- Upload parameters
- Compare parameters
- Default parameters

RECORDING

- Configuration

GRAPHS

- Configuration
- Graph data

COMMUNICATION

- Connection
- TTL mode
- Network info
- Unit info

OPTIONS

- Language

INFO

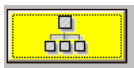
- User profile
- Unit info
- Information

6.2 Function buttons

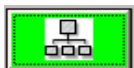
Network button



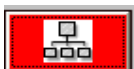
- Start communication between the PC and the device; this button may also be displayed in other colours:



→ Analysing network



→ Communication OK



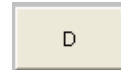
→ Communication failed – Check the serial communication settings

Save button



- Start saving the data.

Select digital button



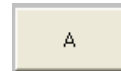
- Digital parameter filter (show the digital parameters only).

Select integer button



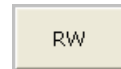
- Integer parameter filter (show the integer parameters only).

Select analogue button



- Analogue parameter filter (show the analogue parameters only).

Select read/write variables button



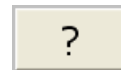
- Filter the read/write parameters;

Display Min/Max button



- Show the minimum and maximum limits of the parameter values.

Info/messages button



- If problems occur when uploading/downloading the parameters, clicking this button displays the type of error and where the problem occurred.

6.3 Parameter database table

Ck	Type	Index	Name	1	0	Description
☐	Anl	1	OffsetS1	0	0	Probes offset S1
☐	Anl	2	OffsetS2	0	0	Probes offset S2
☐	Anl	3	OffsetS3	0	0	Probes offset S3
☐	Anl	4	S1	106	0	S1 Analog Input Status
☐	Anl	5	S2	0	0	S2 Analog Input Status
☐	Anl	6	S3	-759	0	S3 Analog Input Status
☐	Anl	7	S4	-249	0	S4 Analog Input Status
☐	Anl	10	Set_SH_Real	60	0	Current SuperHeat Setpoint
☐	Anl	13	TempEvap	-759	0	Suction temperature value measured
☐	Anl	14	PressEvap	106	0	Evaporation pressure value measured
☐	Anl	15	SH	-981	0	SuperHeat
☐	Anl	16	TempSatEvap	222	0	saturated gas temperature value calculated in the evaporator
☐	Anl	17	Apertura	0	0	Valve opening as a %
☐	Anl	22	SH_Set_Cool	60	0	Superheat set point
☐	Anl	23	SH_Set_Heat	70	0	Superheat set point in Heat mode
☐	Anl	24	SH_Set_Deifr	100	0	Superheat set point in Defrost mode
☐	Anl	25	KP_Cool	25	0	PID proportional factor
☐	Anl	26	KP_Heat	30	0	PID proportional factor in Heat mode
☐	Anl	27	KP_Deifr	40	0	PID proportional factor in Defrost mode
☐	Anl	28	TI_Cool	30	0	Integral time for superheat control in Cool mode
☐	Anl	29	TI_Heat	35	0	Integral time for superheat control in Heat mode
☐	Anl	30	TI_Deifr	30	0	Integral time for superheat control in Defrost mode
☐	Anl	31	Tderiv	10	0	PID derivative time
☐	Anl	32	DeadBand	0	0	Dead zone for PID control
☐	Anl	33	TLowSH	10	0	Integral time for Low SuperHeat Control
☐	Anl	34	TLiOP	15	0	Integral time for Low evaporatore pressure Control
☐	Anl	35	TMOP	25	0	Integral time for High evaporatore pressure Control
☐	Anl	37	MaxTempSHCool	2000	0	Maximum superheat temperature in Cool mode
☐	Anl	38	MaxTempSHHeat	2000	0	Maximum superheat temperature in Heat mode
☐	Anl	39	MaxTempSHDeifr	2000	0	Maximum superheat temperature in Defrost mode
☐	Anl	43	TLowSHCool	25	0	Low superheat value
☐	Anl	44	TLowSHHeat	30	0	Low superheat value in Heat mode
☐	Anl	45	TLowSHDeifr	40	0	Low superheat value in Defrost mode
☐	Anl	46	OffSHCool	0	0	SuperHeat offset in Cool mode
☐	Anl	47	OffSHHeat	0	0	SuperHeat offset in Heat mode
☐	Anl	48	TDifCool	30	0	Differential temperature in Cool mode
☐	Anl	49	TDifHeat	30	0	Differential temperature in Heat mode

- **CK** is used to select the parameters to be saved with the function in the *Parameters* menu → *Download parameters CK*;
- **TYPE** indicates the type of parameter (Dig, Int or Anl);

- **INDEX** is the index of the parameter;
- **NAME** is the name of the parameter;
- **DESCRIPTION** is a short description/name of the parameter;
- The **systems** 1 and 2 **columns** show the values of the parameters read from the connected instruments.

The table can display the values of 2 controllers at a time. The address of the unit that the controls refer to displayed in the heading of the column

	7	8	9
	3	8	
	31	1000	Sog
	273	-1000	Sog
	0	1000	Sog
	0	-1000	Sog

The figure shows an example of reading addresses 3 and 8.

6.4 Area selezione indirizzi



The buttons representing the groups of units are used to select addresses from 1 to 210 (in groups of 10 units). The example in the figure shows the selection of the group of units from 130 to 139.



When serial communication is active, the application disables the buttons for the units that are not connected, and highlights the buttons for the units connected in green



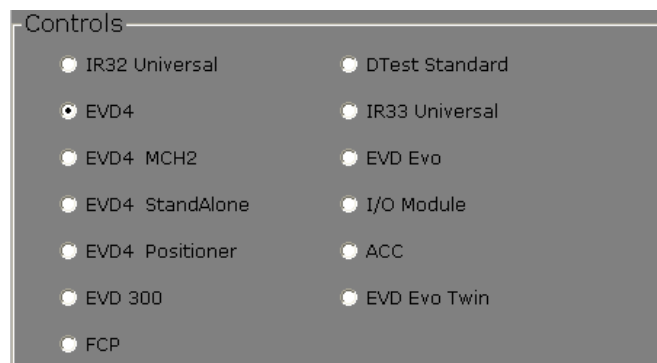
Clicking the reference button displays the unit directly in the layout, and the address is automatically placed in the column heading on the table of variables.

6.5 Groups frame



This presents the families that the various devices are divided into; first choose a group and then go to the Controller selection area.

6.6 Controllers frame



This shows the controllers in the group selected above.

6.7 Tabella sinottica del dispositivo

The NODE1 and NODE2 buttons are used to change the display on the layout with reference to the serial addresses selected and highlighted in the column headings



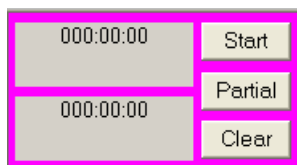
The orange section above the number in the column heading highlights the selected column and the unit displayed in the layout. Selecting a controller with a different address will change the controller in the selected column

The layout shows the main status variables for the selected device

Reg. Probe	Probe 1	Compr.	Defr.
1,2	1,2		
Probe 2	Probe 3	Fan	Aux1
1,1	-204,8		
Probe 4	Virt. Probe	Aux2	Door
-204,8	0		
T_Max	T_Min	Input1	Input2
0	0		
		AI_BP	AI_LwT
		AI_HIT	AI_Ext
		AI_Door	TO_Defr

In maniera grafico-intuitiva mostra all'utente i valori dei principali parametri e lo stato delle uscite del dispositivo.

6.8 Timer



Simple timer.

6.9 Parameter filter buttons



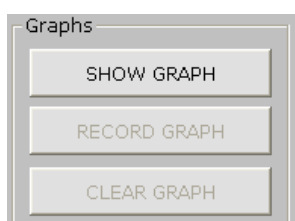
This area includes a series of buttons (these differ from device to device) that act as filters (similarly to the D, I and A - Dig, Int and Anl - filter buttons), so as to divide the parameters into defined groups; the groups that the parameters are divided into are the same as shown in the tables in the device user manuals.

6.10 Image of the device



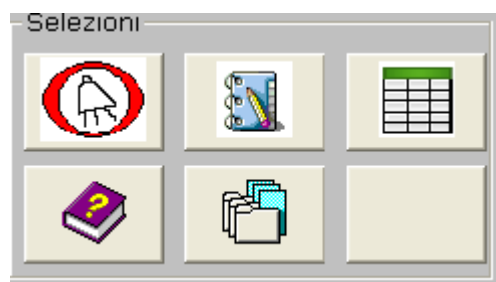
Shows the image of the selected device.

6.11 Graph function buttons



These allow the user to access the window for displaying the graph; this first needs to be configured using the settings windows under GRAPHS → CONFIGURATION and GRAPHS → GRAPH DATA.

6.12 Tool buttons



- Shows the list of alarms.



- Used to enter a note next to each parameter (a free field that can be completely managed by the user to enter texts and drawings, for example, such as images taken from the various device user manuals).



This function is only active when communication has not yet been activated with the device.



- Shows the user manual for the selected device.



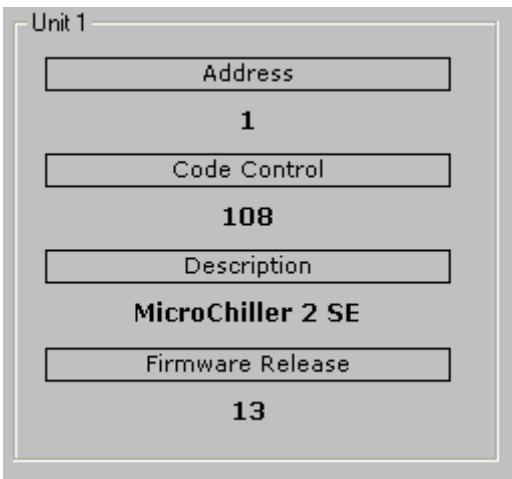
- Returns to the parameter database (closes the windows that are open).



- Displays the reference pages in the product guide.

6.13 Controller data

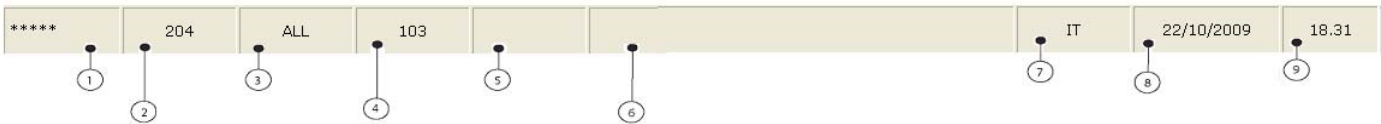
The figure under the image of the controller shows the following information:



Key

Address	Address of the selected unit
Code control	Carel internal code for SV table
Description	Description of the controller
Firmware release	Controller firmware version

6.14 Status bar



The status bar is divided into various areas that show some useful information for the user:

Key

1	Refresh Tool
2	Number of control variables
3	Active filter
4	Code control
5	*****
6	Message
7	Language selected
8	Date
9	Time



All the functions on the main menu and relating to the buttons on the ComTool screen are only enabled (and can therefore be clicked with the mouse pointer) once the device has been connected to the PC

7. PC - DEVICE CONNECTION

The following are required to connect the various CAREL devices to the PC:

1. the serial card on the device (see Chap. 3);
2. a USB - RS485 converter with USB cable (code CVSTDUMOR0);

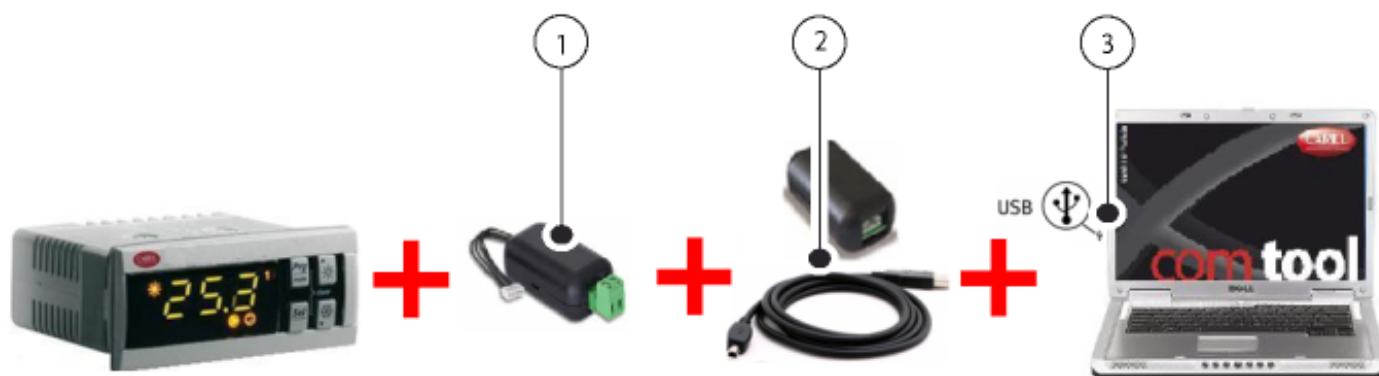


if the device is one of the EVD_400 valves, skip steps 1. and 2. and use the special converter (code CVSTDUTTLO).

3. a free USB port on the PC.



The connection cable from 1 to 2 must be provided by the user. For the connections, see the table of the devices managed by ComTool (Chap 3).



To physically connect the device to the PC, follow the steps illustrated below:

1. connect the USB adapter (code CVSTDUMOR0) the RS485 port on the device (or its serial card)



2. plug the ends of the USB cable into the adapter (A) and the port on the PC (B).



3. Once the connection has been made (using the adapter and the USB cable), ComTool must be configured to manage communication with the device connected.



If not already installed on the PC, download the software driver for the USB/RS485 serial connector from <http://ksa.carel.com>.

8. PC - DEVICE COMMUNICATION

The configuration procedure is simple and involves three steps:

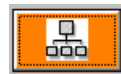
- 1 from the main menu, choose COMMUNICATION → CONNECTION;



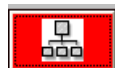
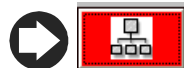
If the communication port settings have not been configured in the corresponding menu and the



button is clicked, this will turn orange -



- and the COMMUNICATION SETTING dialogue box will automatically be displayed for setting the correct serial communication port.

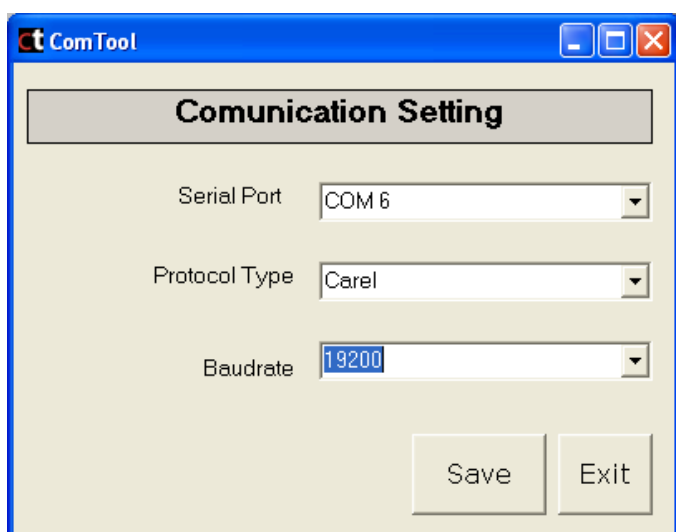


The button is red, on the other hand, if the USB port used for serial communication is not correct or has not been initialised.

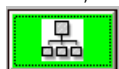


If the instruments are EVD_400 devices, set COMMUNICATION to TTL MODE.

- 2 from the COMMUNICATION SETTING dialogue box that is displayed, choose the serial port that the USB cable is plugged into, select the required Type of protocol and the Baud rate; then press the "EXIT" button;



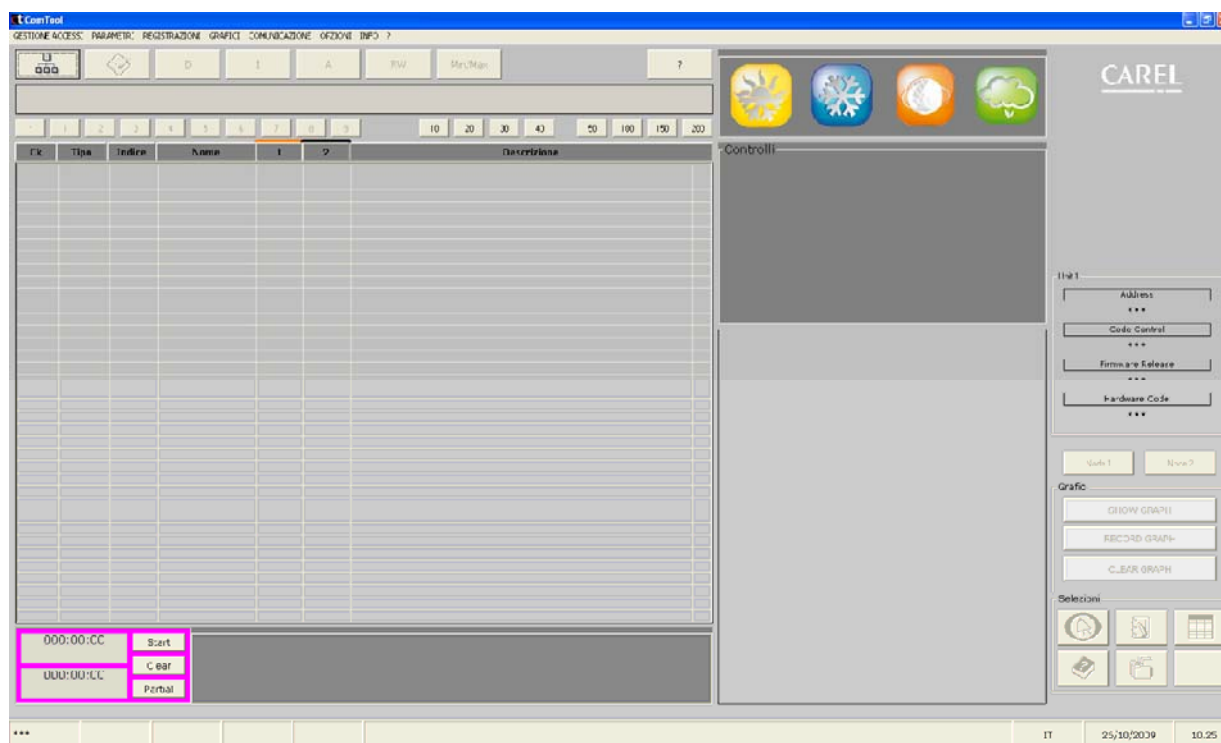
- 3 press the  button to start communication between ComTool and the device; when the connection is established the



button turns green.

9. AUTOMATIC DEVICE SEARCH

The image below shows the initial screen displayed after COMTOOL starts. The table of parameters is completely empty.



 When pressing the button to activate serial communication, COMTOOL starts automatically searching for the devices connected, corresponding to the serial addresses in the address display area. COMTOOL detects the type of devices, highlighting the corresponding button in green. (The image below shows an example with addresses 1, 3 and 8)



10. TUTORIAL



Setting an individual parameter on a device

The following example describes how to edit the configuration on a uC2 SE controller relating to whether or not probe B1 is fitted, and how to enable this probe.

On the ComTool main screen, in the GROUPS frame choose the air-conditioning group, by clicking on the AIR-CONDITIONING item; the frame below called CONTROLLERS will then list the devices corresponding to the air-conditioning family. Choose the type of device (in this example, uC2 SE).



After having selected the required controller, the image of the selected device is shown next to the GROUPS and CONTROLLERS frame.

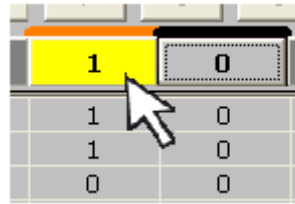


- 1 Once having activated communication, the ComTool main screen shows the current values in the parameter database table.
- 2

Microchiller 2 SE						
1 2 3 4 5 6 7 8 9 10 20 30						
Ck	Type	Index	Name	1	0	
☐	Anl	23	F05	130	0	Set-point pressure value for sum
☐	Anl	24	F05	350	0	Set-point temp value for summer
☐	Anl	25	F06	30	0	Pressure value for differential su
☐	Anl	26	F06	100	0	Temp. value for differential summ
☐	Anl	27	F07	50	0	Diff. pressure to turn OFF the fan
☐	Anl	28	F07	150	0	Differential temp. to turn OFF the
☐	Anl	29	F08	130	0	Set-point pressure value for wint
☐	Anl	30	F08	350	0	Set-point temp value for winter s
☐	Anl	31	F09	40	0	Pressure value for differential wi
☐	Anl	32	F09	50	0	Temp. value for differential winte
☐	Anl	33	F10	30	0	Diff. pressure to turn OFF the fan
☐	Anl	34	F10	50	0	Differential temp. to turn OFF the
☐	Anl	35	F16	0	0	Differential Low Noise in Cooling
☐	Anl	36	F17	0	0	Differential Low Noise in Heating
☐	Dig	10	F01	0	0	Fans output enabled
☐	Int	48	F02	0	0	Fans operating mode
☐	Int	49	F03	35	0	Min. tension threshold for Triac
☐	Int	50	F04	75	0	Max. tension threshold for Triac
☐	Int	51	F11	0	0	Starting time of fans
☐	Int	52	F12	2	0	Triac pulse lenght
☐	Int	53	F13	0	0	Type of fan during defrost
☐	Int	85	F15	0	0	Low Noise Activation
☐	Int	91	F14	0	0	Ventilation

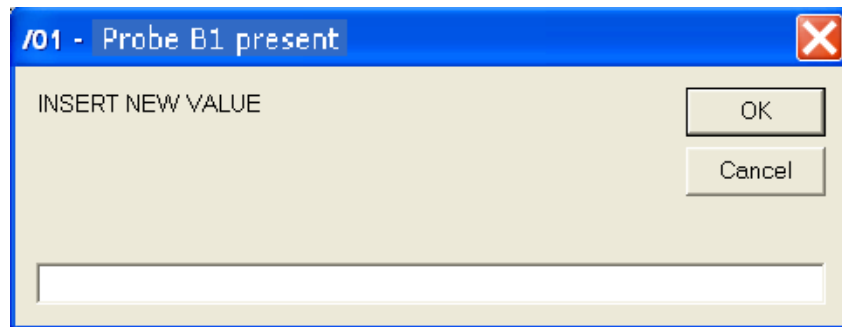
- 2 The parameters can now be modified, as is the purpose of this work session; in this example, digital parameter "/01" will be modified (row highlighted in the previous figure); this parameter indicates whether probe B1 is included (parameter /01 = 1) or not (parameter /01 = 0) in the system controlled by the uC2 SE device.

- 3 Click the column for unit 1, and the area with number 1 will be highlighted in yellow.



1	0
1	0
1	0
0	0

- 4 Click (double click) the desired row, that is, the row corresponding to parameter /01, thus opening the following dialogue box:



/01 - Probe B1 present

INSERT NEW VALUE

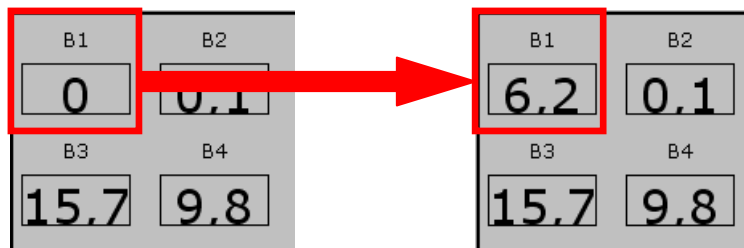
OK

Cancel

- 5 in the field enter the new value to be assigned to parameter /01; in this case, enter 1 (= probe B1 present) and press OK to apply the change.



The change can be further checked by observing the value shown in the device overview relating to probe B1: from "0" that indicates the probe is not enabled, the value acquired by probe B1 is then displayed ("6.2" in the example).



B1	B2
0	0.1
B3	B4
15.7	9.8

B1	B2
6.2	0.1
B3	B4
15.7	9.8



This method for setting the parameters is quick and simple when there is no need to trace the changes made and a relatively small number of parameters is being set; below on the other hand is the procedure to be followed when needing to save the list of parameters and the changes made to an .xls file.



Setting a series of parameters for a device and save to .xls file

Below is a description of how to proceed when needing to change a series of parameters and keep trace of the original values in an .xls file; specifically, the minimum and maximum pressure limits are modified (again using a uC2 SE controller).

Repeat steps 1 to 5 in the example above to activate communication between the PC and the device and then proceed as follows:

1. click the filter read/write parameters button so as to distinguish (in blue) the parameters that are modifiable from those that are not; once having clicked this button, as well as showing the parameters in blue or pink (read-only), the button itself will be orange.
2. From the parameter database table shown on the ComTool main screen, in the column called CK (checked) select the parameters to be saved to an .xls file and thus to be modified; the parameters are selected by simply clicking the checkbox under the CK column.

CK	Type	Index	Name	1	0	Description
☐	Anl	1	/11	0	0	Min. value of pressure
☐	Dig	1	/01	1	0	Probe B1 present
☐	Int	1	H99	20	0	Software release
☐	Anl	2	/12	345	0	Max. value of pressure
☐	Dig	2	/02	1	0	Probe B2 present
☐	Int	2	H98	17	0	Expansion software release
☐	Anl	3	/13	0	0	Probe B1 calibration
☐	Dig	3	/05	0	0	Probe B5 present
☐	Int	3	H97	60	0	Driver valve 1 software release
☐	Anl	4	/14	0	0	Probe B2 calibration
☐	Dig	4	/06	0	0	Probe B6 present
☐	Int	4	H96	0	0	Driver valve 2 software release
☐	Anl	5	/15	0	0	Probe B3 calibration
☐	Dig	5	/23	0	0	Measure unit
☐	Int	5		1000	0	Probe 1- Gain constant

3. From the ComTool menu select PARAMETERS → DOWNLOAD CK PARAMETERS (so as to download an Excel sheet only including the selected parameters). ComTool, by default, saves the file in the chosen directory with the following format: file_name – device_name – yyyy_mm_gg – hh.mm.ss.xls. Below is the Excel sheet showing the parameters that were selected on the ComTool main screen.

Cod.	Tipo	Indice	Valore	Parametro	Descrizione	-RW-
1	Anl	1	0	/11	Valore minimo pressione	RW
2	Anl	2	345	/12	Valore massimo pressione	RW

The **PARAMETERS → DOWNLOAD RW PARAMETERS** function can be used to save all of the READ/WRITE variables included in the table of parameters. This function is useful for completely saving the writable parameters and keeping trace of the general programming of the unit

The **PARAMETERS → DOWNLOAD PARAMETERS** function can also be used to save all of the variables described in the table of parameters. The figure below shows a file saved using the function to save all of the parameters. The RW column distinguishes between read-only and read/write parameters.

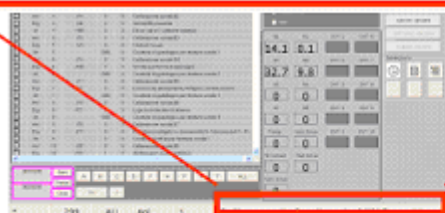
testrr - uC2_SE - 2010_1_29 - 9.30.35.xls							
	A	B	C	D	E	F	G
1	CONTROL NAME			uC2_SE			
2	CONTROL CODE			108			
3	FIRMWARE RELEASE			20			
4	DATE			29/1/2010 - 9:26			
5	DESCRIPTION			uC2 SE - Nuovo controllo compatto per unità chiller/HP			
6							
7	Cod.	Type	Index	Value	Parameter	Description	- RW -
8	1	Int	25	5	c01	Minimum running time	RW
9	2	Int	26	5	c02	Minimum stopping time	RW
10	3	Int	27	5	c03	Time-interval between 2 starts	RW
11	4	Int	28	5	c04	Time-delay between starts of compr.s when starting	RW
12	5	Int	29	0	c05	Time-delay between turning OFF the two compressor	RW
13	6	Int	30	0	c06	Time delay at start-up	RW
14	7	Int	31	10	c07	Delay in swit. on comp. after swit. on the pump	RW
15	8	Int	32	1	c08	Delay in swit. OFF comp. after swit. OFF the pump	RW
16	9	Int	33	0	c09	Max. time tandem compressor on.	RW
17	10	Int	34	0	c14	Timer thresold for maintenance alarm	RW
18	11	Int	35	0	c17	Minimum time between two pump starts	RW
19	12	Int	36	0	c18	Minimum pump on time	RW
20	13	Anl	122	0	c10	Timer compressor 1	R
21	14	Anl	123	0	c11	Timer compressor 2	R
22	15	Anl	124	0	c12	Timer compressor 3	R
23	16	Anl	125	0	c13	Timer compressor 4	R
24	17	Anl	126	5	c15	Pump/inlet evaporation fan timer	R
25	18	Anl	127	0	c16	Pump/inlet fan condensation timer	R



Programming a device using a configuration file

From **PARAMETERS** → **UPLOAD PARAMETERS** select the file containing the previously saved values of the parameters. Wait until the Upload operation ends. Conclusion of the operation is notified by a message displayed in the status bar at the bottom part of the program window.

Writing operation done successful of N° 4 Parameters





Comparing device parameter against a configuration file

The values of the modified parameters updated in the device table can be compared against the previous values using the PARAMETERS → COMPARE PARAMETERS function, which opens the file initially saved with the old values and compares them against any new values entered subsequently.

Selecting a previously saved file from PARAMETERS → COMPARE PARAMETERS, ComTool displays the list of the parameters from the XLS file in the table, and highlights the rows of variables with different values in another colour.

Microchiller 2 SE						
* 1 2 3 4 5 6 7 8 9 10 20 30 40 50 100						
Ck	Type	Index	Name	1	0	Description
☐	Int	25	c01	5	0	Minimum running time
☐	Int	26	c02	5	0	Minimum stopping time
☐	Int	27	c03	5	0	Time-interval between 2 starts
☐	Int	28	c04	5	0	Time-delay between starts of compr.s when starting
☐	Int	29	c05	0	0	Time-delay between turning OFF the two compressor
☐	Int	30	c06	0	0	Time delay at start-up
☐	Int	31	c07	10	0	Delay in swit. on comp. after swit. on the pump
☐	Int	32	c08	1	0	Delay in swit. OFF comp. after swit. OFF the pump
☐	Int	33	c09	0	0	Max. time tandem compressor on.
☐	Int	34	c14	0	0	Timer threshold for maintenance alarm
☐	Int	35	c17	0	0	Minimum time between two pump starts
☐	Int	36	c18	0	0	Minimum pump on time
☐	Anl	122	c10	0	0	Timer compressor 1
☐	Anl	123	c11	0	0	Timer compressor 2
☐	Anl	124	c12	0	0	Timer compressor 3
☐	Anl	125	c13	0	0	Timer compressor 4
☐	Anl	126	c15	5	0	Pump/inlet evaporation fan timer
☐	Anl	127	c16	0	0	Pump/inlet fan condensation timer

To return to the real time display, simply regenerate the table of parameters by pressing any button



For convenience, in the example the .xls file has been saved only containing the parameters selected in the CK column, however an Excel sheet can be saved with the entire list of parameters for the device using the PARAMETERS à DOWNLOAD PARAMETERS function.



Creating a new user and managing access privileges

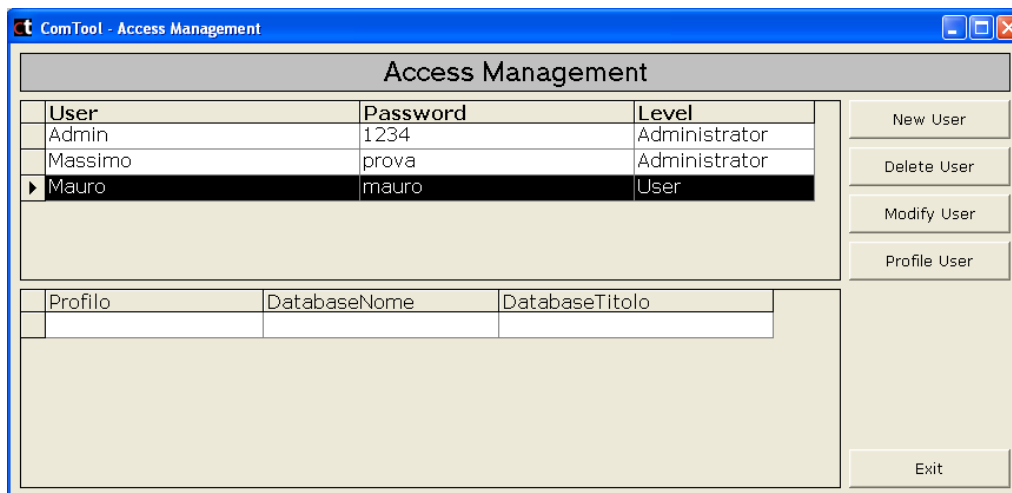
ComTool can manage three different types of user:

- Administrator: access to the all the ComTool functions.
- Normal user: cannot use all the functions of the program (depending on the settings).
- Viewer: can only view the list of parameters, but not modify the description and/or values.

1. From the main menu, go to ACCESS MANAGEMENT → USER CONFIGURATION to display the following window:

User	Password	Level
Admin	1234	Administrator
Massimo	prova	Administrator
Mauro	mauro	User

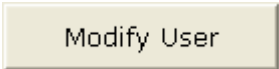
2. In this window, new users can be entered (clicking );

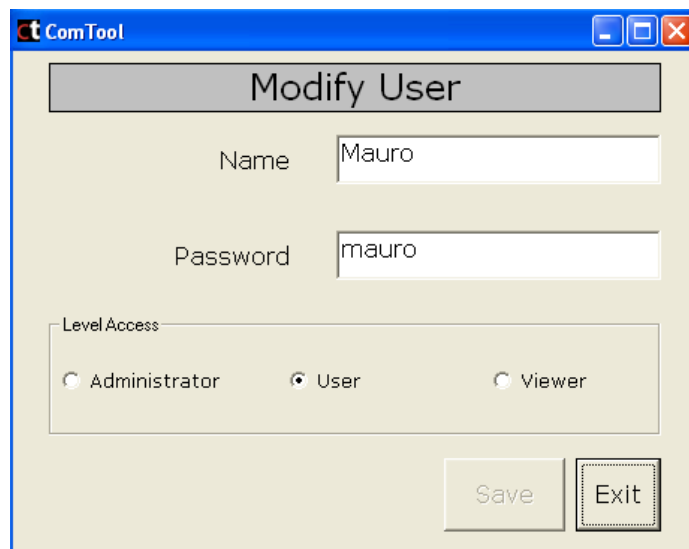


The screenshot shows the 'ComTool - Access Management' window. It features a table with three columns: 'User', 'Password', and 'Level'. The table contains three rows: 'Admin' with password '1234' and level 'Administrator', 'Massimo' with password 'prova' and level 'Administrator', and 'Mauro' with password 'mauro' and level 'User'. The 'Mauro' row is selected. To the right of the table are four buttons: 'New User', 'Delete User', 'Modify User', and 'Profile User'. Below the table is a section with three columns: 'Profilo', 'DatabaseNome', and 'DatabaseTitolo'. At the bottom right is an 'Exit' button.

User	Password	Level
Admin	1234	Administrator
Massimo	prova	Administrator
Mauro	mauro	User

Buttons: New User, Delete User, Modify User, Profile User, Exit

3. While clicking  and entering the NAME and PASSWORD in the respective fields, the type of user profile can be modified, choosing between Administrator, User and Viewer.



The screenshot shows the 'ComTool - Modify User' window. It has two text input fields: 'Name' with the value 'Mauro' and 'Password' with the value 'mauro'. Below these fields is a 'Level Access' section with three radio buttons: 'Administrator', 'User' (which is selected), and 'Viewer'. At the bottom right are two buttons: 'Save' and 'Exit'.

Fields: Name (Mauro), Password (mauro)

Level Access: ☐ Administrator, ☒ User, ☐ Viewer

Buttons: Save, Exit

4. , on the other hand, is used to access a window with advanced settings relating to the selected user.



Creating a graph of variable values

ComTool can plot a graph of the variables controlled by the connected device so as to generate simulations and analyse trends.

Below is a description of the operations to be performed to use the graph function.

1. From the main menu, choose **GRAPHS** → **GRAPH CONFIGURATION** to access the following window, used to set the details of the graphs;

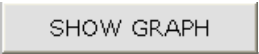
The 'Graph Configuration' window in ComTool is used to set the details of the graphs. It contains several sections:

- Graph Duration:** Radio buttons for 5 minuti, 10 minuti, 30 minuti, 1 ora, 2 ore, 5 ore, 12 ore, 24 ore, and Auto.
- Acquisition Frequency:** Radio buttons for 1/2 Secondo, 1 Secondo, 2 Secondi, and 5 Secondi.
- First Set Reference:** Radio buttons for Valore and Dato, with an Indirizzo field.
- Second Set Reference:** Radio buttons for Valore and Dato, with an Indirizzo field.
- Analog Signal Selection:** Checkboxes for B1, B2, B3, B4, B5, B6, B7, B8, Temp. Driver 1, Press. Driver 1, SH Driver 1, T. Sat. Driver 1, and Posiz. Driver 1.
- Analog Signal Selection:** Checkboxes for OUT 1, OUT 2, OUT 3, OUT 4, OUT 5, OUT 6, OUT 7, OUT 8, OUT 9, and OUT 10.
- Tipo Registrazione:** Radio buttons for Continua and A Tempo.
- Buttons:** Save and Exit.

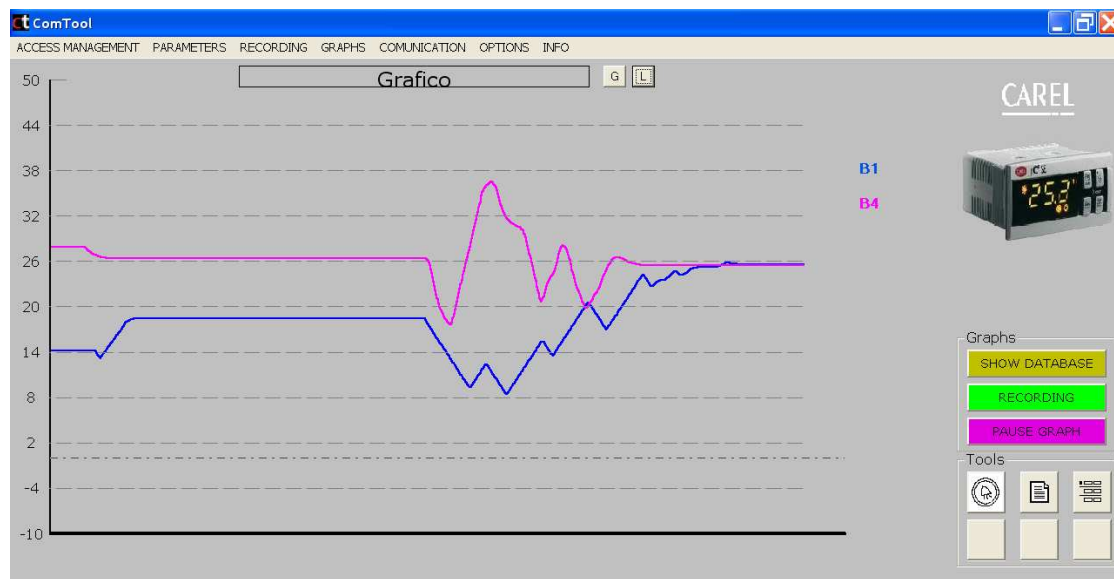
2. After having correctly entered the required settings, save and exit the window by clicking  and .
3. Under **GRAPHS** → **GRAPH DATA** enter the name of the graph.

The 'Graph Data' window in ComTool is used to enter the name of the graph and set the maximum and minimum values for the data series.

- Graph Title:** Text field with the value 'Graph'.
- Graph 1:** Max Value (30) and Min Value (-10).
- Graph 2:** Max Value (70) and Min Value (-10). There is an 'Enable' checkbox checked.
- Buttons:** Griglia, Legenda, Save, and Exit.

4. To display the graph of the variables selected in the previous steps, click .

5. Once having accessed the graph display screen, clicking **RECORDING** saves the values of the variables to be shown on the graph and then clicking **REFRESH GRAPH** ComTool starts displaying the graph.



3. The graph can be saved again after a certain period of time by clicking **RECORDING** again, which then changes to **SAVE GRAPH**; this button automatically opens a dialogue box for entering the location of the directory where the file (.xls format) of the graph generated will be saved.



The **G** **L** buttons show or hide:
G, the grid;
L, the legend.



Using a Customised Database

Creating the Database

ComTool can be used with a customised database; the list of variables to be managed must be entered in an Excel file, in the following format:

	A	B	C	D	E	F	G	H	I	J	K	L
	Tipo	Indice	Nome	VAR1	VAR2	DescrizioneIT	Classe	Note	RW	Min	Max	Default
1	Anl	1	Anl_1			Descrizione Variabile / Variable description			RW	0	2	0
2	Anl	2	Anl_2			Descrizione Variabile / Variable description			R	1	999	345
3	Anl	3	Anl_3			Descrizione Variabile / Variable description			RW	-120	120	0
4	Anl	4	XXXX			XXXXXXXXXX						
5	Anl	5	XXXX			XXXXXXXXXX						
6	Anl	6	XXXX			XXXXXXXXXX						
7	Anl	7	XXXX			XXXXXXXXXX						
8	Anl	8	XXXX			XXXXXXXXXX						
9	Anl	9										
10	Anl	10										
11	Anl	11										
12	Anl	11										
13	Dig	1	Dig_1			Descrizione Variabile / Variable description			RW	0	1	0
14	Dig	2	Dig_2			Descrizione Variabile / Variable description			R	0	1	0
15	Dig	3	Dig_3			Descrizione Variabile / Variable description			RW	0	1	0
16	Dig	4	XXXX			XXXXXXXXXX						
17	Dig	5	XXXX			XXXXXXXXXX						
18	Dig	6	XXXX			XXXXXXXXXX						
19	Dig	7	XXXX			XXXXXXXXXX						
20	Dig	8	XXXX			XXXXXXXXXX						
21	Dig	9										
22	Dig	10										
23	Dig	11										
24	Int	1	Int_1			Descrizione Variabile / Variable description			RW	0	59	0
25	Int	2	Int_2			Descrizione Variabile / Variable description			R	0	23	0
26	Int	3	Int_3			Descrizione Variabile / Variable description			RW	0	59	0
27	Int	4	XXXX			XXXXXXXXXX						
28	Int	5	XXXX			XXXXXXXXXX						
29	Int	6	XXXX			XXXXXXXXXX						
30	Int	7	XXXX			XXXXXXXXXX						
31	Int	8	XXXX			XXXXXXXXXX						
32	Int	9										
33	Int	10										
34	Int	11										

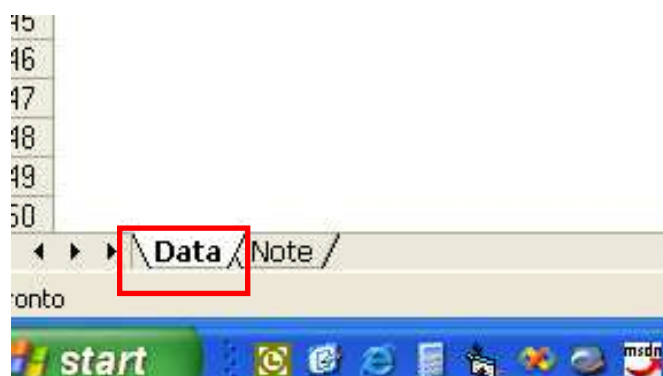
- **TYPE:** Type of variable
 - o ANL → Analogue
 - o DIG → Digital
 - o INT → Integer
- **INDEX:** Index of the supervisor variable
- **RW:** column that defines whether the variable is:
 - o RW → Read/write variable
 - o R → Read-only variable
- **NAME:** Name identifying the variable.
- **DESCRIPTION IT:** Description of the variable.
- **CLASS:** Group the variable belongs to (managed using the FILTER function).
- **MIN:** Minimum value of the variable (minimum allowed for data entry).
- **MAX:** Maximum value of the variable (maximum allowed for data entry).
- **DEFAULT:** Default value of the variable (value used when the default parameter values are loaded).



The file can be edited directly in Excel. The following limits must be observed

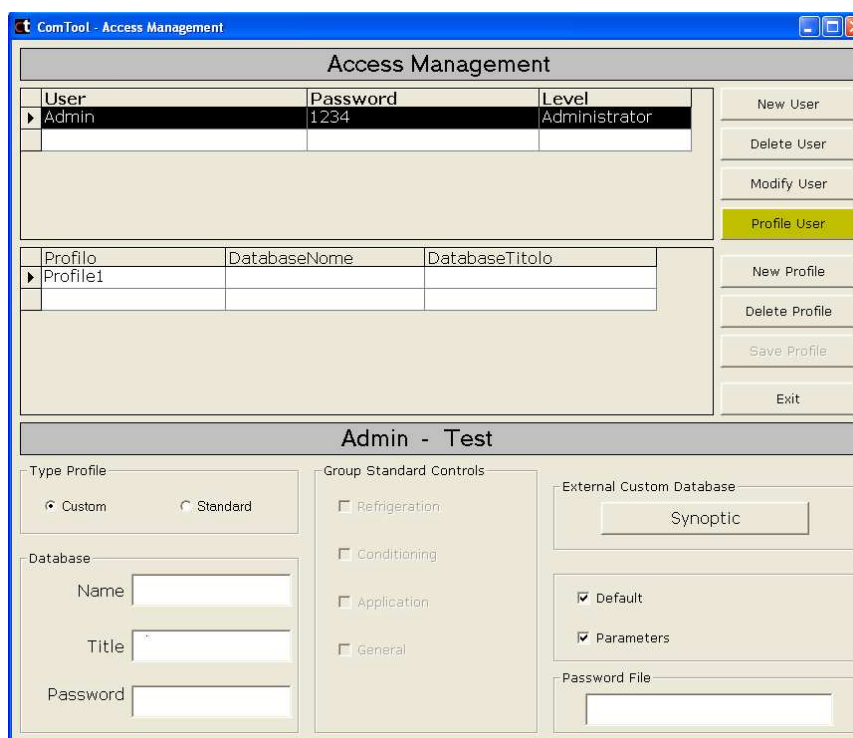
1. The Type must absolutely be one of the three types of variable described above.
2. The same Type of variables cannot have the same indices.
3. The data associated with the RW column must be R or RW. Completing the table incorrectly may cause problems or errors when loading the database.

 All the files of variables created by the user, before being loaded into the application, must be located in the "Databases" directory (sub-directory of the main ComTool application folder). This directory also includes a sample file as support in completing the lists of customised variables. The worksheet in the Excel file must be called "Data".



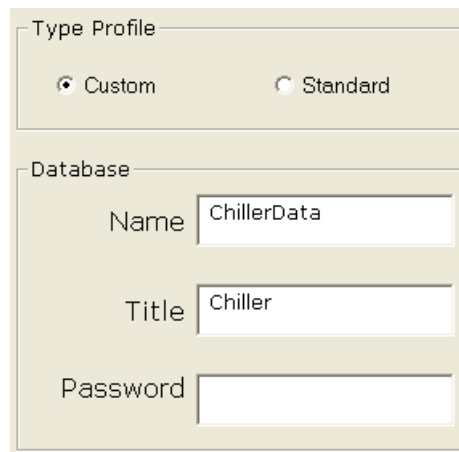
Loading the Database into ComTool

To be able to use a list of customised variables, a PROFILE needs to be defined and associated with the external database.



In the ACCESS MANAGEMENT window, create a CUSTOM profile
 Then open the form that displays the profiles by selecting USER PROFILE.
 To create a new profile, select NEW PROFILE
 In the PROFILE TYPE selection area select CUSTOM and complete the NAME and TITLE fields.

The name in the NAME field must correspond to the name of the Excel file.



The example of the previous figure refer to a file called ChillerData.xls saved in the "C:\Programs\ComTool\Databases" directory. The name associated with the file of variables can be chosen freely by the user. The only restriction is that there must be perfect correspondence between the file name and the name entered in the NAME field (without the .xls extension).

Managing the filters on the database

The CLASS column in the variable list file can be used to define groups of variables, entering classification letters or codes (example A, Conf, DEFR, etc.).

Classe
A
A
Conf
Conf
Conf
Conf
Defr
Defr
Defr
SV

When ComTool is activated loading the custom profile, the bar of filter buttons should show the following objects.



The ALL and SV buttons are displayed by default, and have the following meanings:

- ALL - Display all the variables
- SV - Display the supervisor variables

Managing the variables in the overview

In the OVERVIEW CONFIGURATION window, the variables to be monitored and displayed on the ComTool main screen can be configured in the section corresponding to the overview

The image shows the 'Synoptic Configuration' window in ComTool. It is divided into two main sections: 'Selezione Segnali Digitali' (Digital Signal Selection) and 'Selezione Segnali Analogici' (Analogue Signal Selection). Each section has a table with 'Description' and 'Address' (or 'T/Address') columns, and a checkbox for selection.

Selezione Segnali Digitali		
Description	Address	
Dig_1	12	☒ Digital 1
Dig_2	13	☒ Digital 2
ALM	17	☒ Digital 3
In_1	18	☒ Digital 4
		☐ Digital 5
		☐ Digital 6
		☐ Digital 7
		☐ Digital 8
		☐ Digital 9
		☐ Digital 10

Selezione Segnali Analogici		
Description	T/Address	
Probe_1	35	☒ Analogue 1
Probe_2	36	☒ Analogue 2
Fan%	I23	☒ Analogue 3
Steps	I24	☒ Analogue 4
		☐ Analogue 5
		☐ Analogue 6
		☐ Analogue 7
		☐ Analogue 8
		☐ Analogue 9
		☐ Analogue 10

Buttons: Save, Exit

The configuration window is divided into two sections: the first corresponds to the digital variables, while the second refers to the integer or analogue variables. For each variable monitored, a brief description and a reference numeric address can be entered.



To distinguish the integer variables from the analogue variables, the letter I must be placed before the number of the variable. For example:

- *T/ADDRESS = 32 → Analogue variable number 32*
- *T/ADDRESS = I32 → Integer variable number 32*

When ComTool is opened and the custom profile is loaded with the configuration set in the previous figure, the main window will display the overview shown below:

The image shows a portion of the ComTool main window. A red rectangle highlights a grid of variable displays. The grid has two rows and four columns. The top row labels are 'Probe_1', 'Probe_1', 'Dig_1', and 'Dig_2'. The bottom row labels are 'Fan%', 'Steps', 'ALM', and 'In_1'. Each label is above a rectangular display area. To the right of the grid, there are buttons and a 'Selezioni' (Selections) section.

11. INFORMATION ON COMTOOL - SUPPORT

Information on the version of ComTool or the system is available under the INFO/INFORMATION menu. Selecting this opens the screen shown below:



For any suggestions or problem please send an email to:

comtool@carel.com

CAREL reserves the right modify or change its products without prior warning

CAREL

CAREL INDUSTRIES HQs

Via dell'Industria, 11 - 35020 Brugine - Padova (Italy)

Tel. (+39) 049.9716611 Fax (+39) 049.9716600

<http://www.carel.com> - e-mail: carel@carel.com

