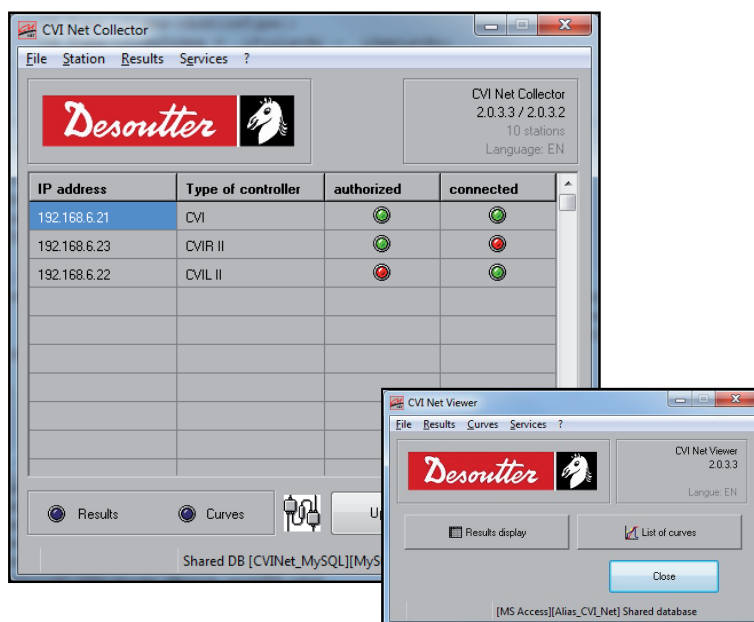


CVI Net

CVI Net Collector / CVI Net Viewer

Release 2.0

User's Manual



Original instructions.

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1 - GENERAL INSTRUCTIONS

1.1 - Introduction

This manual explains how the software which composes CVI Net:

- CVI Net Collector
- CVI Net Viewer

The aim of this product is giving the client flexible means for collecting results through the Ethernet network, as well as an accessible and open format to store in a database acknowledged by the market.

The main functions of this software are divided into modules as follows:

CVI Net Collector

- Collecting of results and of curves in real time through the Ethernet network in order to keep records.
- Storage in a SQL type database with a documented format.
- Checking of connections to the tightening controllers and display of alarms when necessary.
- Display in real time of the collected results.

CVI Net Viewer

- Display of the results per:
 - Station.
 - Spindle.
 - Date.
 - VIN number.
 - Minimum and maximum torque.
 - Minimum and maximum angle
 - Spindle report (all/OK/NOK).
 - Minimum and maximum final torque.
- Display of the curves.

1.2 - Conditions of use



The CVI Net (Collector and Viewer) software work under Windows NT, 2000, XP, Vista, 7.



These software cannot be installed under Windows 95/98, as these environments do not include the necessary elements to insure communication between modules.

- Personal computer and tightening controllers connected through the Ethernet network.
- The SQL compliant on line database is available from the personal computers on which the CVI Net Collector and CVI Net Viewer modules have been installed.
- CVI Net Collector: a single instance application at a time.
- CVI Net Viewer : several instances of the application can be launched at the same time, either on one or on several personal computers.

1.3 - Protection of the software

Only the module "CVI Net Collector" is protected by a registration code.



As long as the code is not entered, the software works in evaluation mode.

The module "CVI Net Viewer" can be installed and used without any limitation as it is not protected.

1.3.1 - Evaluation version

In evaluation mode CVI Net Collector can be run only for 90 days.

After these 90 evaluation days, if you want to carry on using the software, you must ask for your registration code.

To do so, you can use a standard registration form which is available as you launch the software, or through the menu "Services /Registration code".



- Copy the registration form, fill it in and send it to CP by email (tightening.support@cp.com) or by fax (+33 (0)240 802 077).
- Each time the software is run, a message that indicates the number of remaining days before the evaluation is displayed. When the period has elapsed, a warning message is displayed: "You are not allowed to run this software".



An evaluation version corresponds to the option "Kit for 10 tightening controllers".

1.3.2 - Registered version

Once the "CVI Net Collector" software has been registered, the code you enter allows to determine the number of stations that can be connected.

Depending on the option you have chosen, the number of stations that you can declare (see Station list) is as follows:

- Kit for 1 tightening controller
- Kit for 10 tightening controllers
- Kit for 25 tightening controllers
- Kit for 50 tightening controllers
- Kit for 200 tightening controllers



2 - CVI NET COLLECTOR MODULE

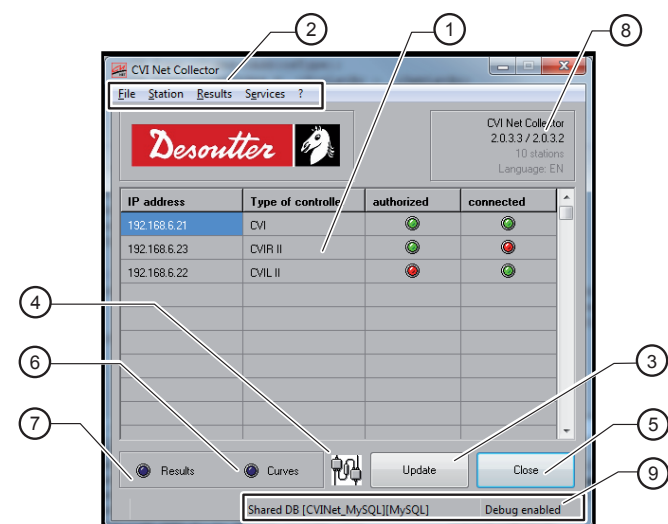
2.1 - Initiating the program

- Click on menu "Start" in the Windows task bar.
- Move the arrow of your mouse on "Programs".
- Select "CVI Net" in the program's list.
- Click on "CVI Net Collector" to start.



- You can access the menus/buttons directly from the keyboard (without using the mouse) by using the [Alt] key and the keyboard shortcut (underlined letter of the menu or button).
- The [Tab] key allows you to scroll forward through the menus/windows.
- Pressing simultaneously the [Shift] + [Tab] keys allows you to scroll backward.

2.2 - Main screen



Legend

- 1 List of stations to "listen to"
- 2 Menu
- 3 Update button
- 4 Status: waiting for results and curves
- 5 Close button
- 6 Curves indicator
- 7 Result indicator
- 8 Version information
- 9 Database version

Menus (2) available on the main screen:

Menu	Submenu
File	Exit
Station	Station list (See §2.9, page 7)
Results	Configuration (See §2.10, page 8)
	Display in real time (See §2.11, page 8)
Services	Language of the software
	General parameters (See §2.4, page 5)
	Collect the data (See §2.6, page 6)
	Manage privileges (See §2.7, page 6)
	Manage your login (See §2.8, page 7)
	Registration code (See §1.3.2, page 3)
?	About...

The main screen of CVI Net Collector displays the list of stations to "listen to" (1) (controller number + IP address) as well as the status of the connection with every station.

The updating of the display of the connections depends on the frequency which has been entered in the general parameters.

An "Update" button" (3) does however allow you to update the display on request.

To visualise the processing of the results and curves, there are 2 diodes (6, 7) on the main screen.

The symbol (4) opposite is on the main screen.

It shows if the module "CVI Net Collector" is waiting for results and curves, or if it doesn't process the results/curves sent by the CVI (in this case, the symbol is crossed).

See also the paragraph (See §2.6, page 6).



To choose the stations to monitor,
See §2.9, page 7.

2.3 - Selecting a Language

► Menu = Services / Language of the software

You can change the language used for the menus and dialog boxes by selecting it in the list.

To do this, go to the menu "Services" then "Language of the software".

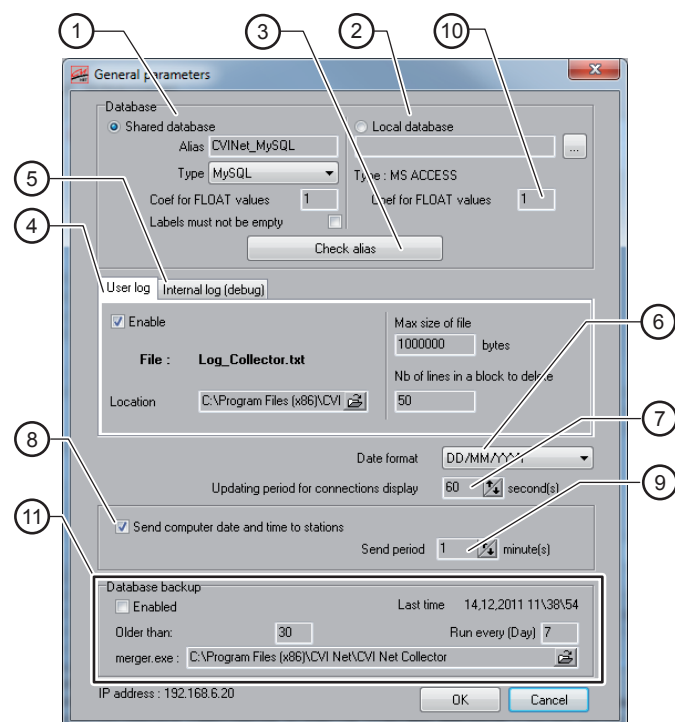
6 languages are currently available:

- English
- French
- German
- Spanish
- Chinese
- Japanese

Select your language and validate.

2.4 - General parameters

► Menu = Services / General parameters



Legend

- 1 Shared database parameters
- 2 Local database parameters
- 3 Check alias button
- 4 User log
- 5 Internal log (debug)
- 6 Date format
- 7 Updating period for connections display
- 8 Send computer date and time to stations
- 9 Send period
- 10 "Coef for FLOAT values" parameter
- 11 Database backup

This screen displays and allows to modify the following parameters:

2.4.1 - Alias of the database

Corresponds to the chain of characters which was defined when installing the ODBC driver, and his alias in the utility "BDE Administrator".



By default = "Alias_CVI_Net"

"Check Alias" button (2) allows to check if the alias entered is valid and if the connection to the base is possible.

2.4.2 - Date format

Selection of the display/capture format for dates.

Available formats:

- DD/MM/YYYY (by default)
- MM/DD/YYYY
- YYYY/MM/DD

2.4.3 - Updating period for connections display

- From 1 up to 999 seconds (60 seconds by default).

2.4.4 - Station Synchronisation

Option "Send computer date and time to stations" (box to check) (8).

if this option is checked, the date and time of the personal computer are sent to stations. You can enter the sending period in the data entry field "Send period" (9) (in minutes – 1 to 999).



By default:

- Synchronisation is not selected.
- Updating period = 60 minutes.



If this option is checked, make sure the equivalent option in CVIPC2000 is not checked too!

2.4.5 - Switch between local and shared database

It is possible to choose between 2 ways to address data:

- Shared database (1) = access on network using DBMS (Oracle, SQL Server, MySQL,...).
- Local database (2) = MS Access file on local hard-disk.
- When "Shared database" (1) is checked, we must give alias name for database (ODBC source name), and the type of the database (MS Access, Oracle, SQL Server or MySQL).
- When "Local database" (2) is checked, we must give full pathname for the MS Access file. This file can be done by using 'Export to MS Access' from shared data.
- "Check alias" button (3) is available for both modes. It is used to check that the link to the database works.



"Coef for FLOAT values" (10) should only be changed in case of Oracle database – or data exported from Oracle database.

In fact, this is a way to avoid loss of decimal part for "float" values :

- Each value is multiplied by coef before storage into Oracle
- Each value is divided by coef after having been read, and before to be displayed or printed.

For example, coefficient 1000 will guarantee that we keep 3 decimals for float values.

2.4.6 - Database backup

- Enable this option to delete the tightening results and curves from the current database and store them into an Access backup database.

Older than: the tightening results and curves older than xx days will be stored into an Access database.

Run every (Day): the backup will be executed every xx day.

merger.exe: this is the directory where CVINet merger is installed.



2.5 - Events & Logs

- CVI Net gives 2 levels of event Log :
 - User log
 - Internal log (for Debug)
- 4 Log files are available :
 - Spy_Collector.txt & Spy_Viewer.txt for "Internal Logs".
 - Log_Collector.txt & Log_Viewer.txt for "User Logs".
- Events stored in User Logs:
 - "Start application".
 - "Close application".
 - "Connect user", with login + privilege.
 - "Connect database :", with type of database / access mode / alias or pathname for local file.
 - "Disconnect database".
 - "Add authorization for :", with IP address of controller that has been added.
 - "Remove authorization for :", with IP address of controller that has been removed.
- Events stored in Internal Logs
 - Contains information useful to analyze behavior of CVI Net (for debug only).

2.5.1 - How to use it

2 tabs are available:

- "User log" (4).
- "Internal log" (5).
- Only administrators can modify parameters in these tabs (members and Guests can only view Log parameters).
- To enable Log, check "Enable" and fill in "Location" field with a valid directory.
- It is also possible to change max size of file or the number of lines to delete each time max size is achieved.

2.6 - Collect data

► **Menu = Services / Collect data**



Legend

- 1 Network monitoring enabled
- 2 Network monitoring disabled

The menu (2) allows to stop the option of monitoring the network.

In this case, the results and curves transmitted by the CVI are not processed; the connection symbol is crossed. (2).

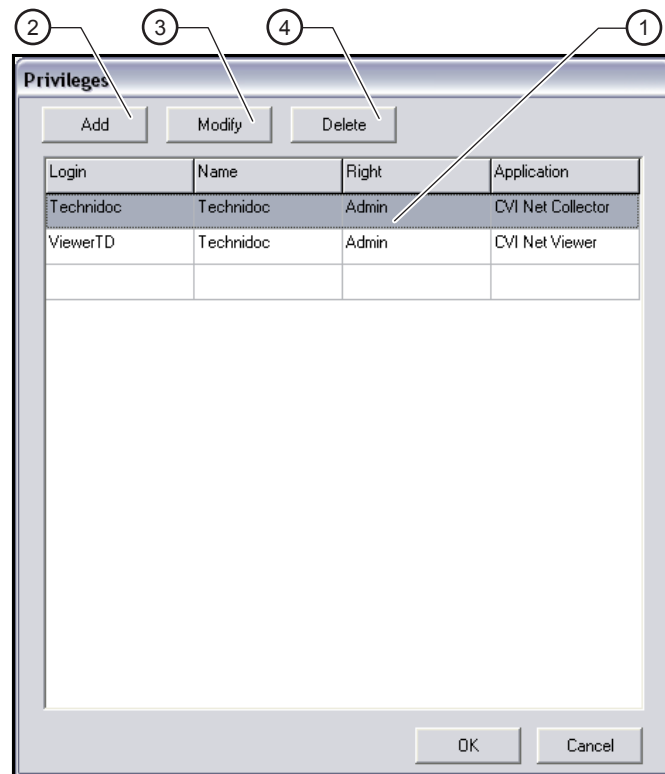
If you click again on this menu, you reactivate the monitoring of the network.

The symbol of connection is then as it was at the beginning (1).

2.7 - Privilege management

► **Menu = Services / Manage privileges**

It is preferable to implement access privilege management to protect the data from handling errors.

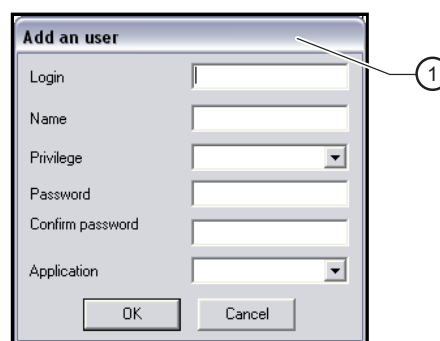


Legend

- 1 User privilege area
- 2 Add button
- 3 Modify button
- 4 Delete button

The privilege management menu has an Add button (2), used to add a user to the list (1).

- Click the Add button (2) to open the following window:



Legend

- 1 Add an user

Login

- User name.



A prompt for this user name will appear every time the software is launched.



To skip the login window on program launch:

- Right-click the program shortcut.
- Click the "Properties" option.
- Click the "Shortcut" tab.
- In the "Target" window, add the text "-usrpsw:user_name@password" to the end of the command line.

Name

- User name.

Privilege

- Lets you choose the types of privilege to be assigned to the user.
 - Administrator
 - Member
 - Guest

Password

- Lets you enter a password for the user account.



A prompt will appear for this password every time the software is launched.

Password confirmation

- The password must be entered a second time to guard against typing errors.

Application

- Software for which the user account is accessible.
 - CVI Net Collector
 - CVI Net Viewer

2.8 - User account

► Menu = Services / Manage your login

The User Account menu is used to display information concerning the active user.

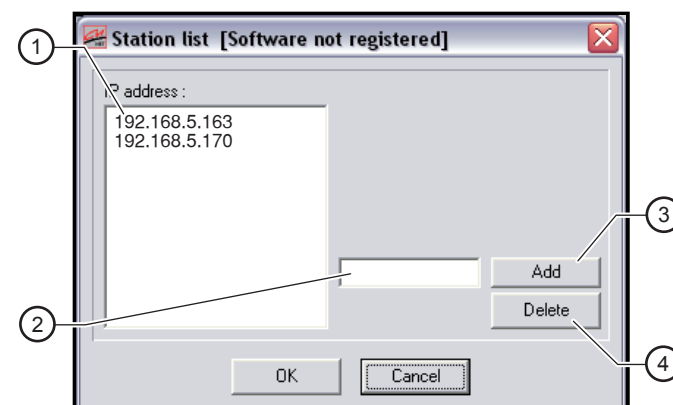


The user account password can be modified via this menu.

2.9 - Station list

► Menu = Station / Station list

This screen displays the list of the IP addresses of the stations to monitor: those who are allowed to communicate.



Legend

- 1 List of IP addresses of machines to be monitored
- 2 New address input area
- 3 Add button
- 4 Delete button

It is possible to add a station to monitor, through entering the controller IP address (2), and then clicking on the button "Add" (3).

Then there is a control to check that the number of stations to monitor is not higher than the number allowed by the chosen option (1, 10, 25, 50 or 200 stations, depending on the option), and that the controller IP address is not already on the list.

In case of a mistake, a message informs the user that this adding is not possible; otherwise the list is updated with the new entry.

As you exit this screen, the main window is updated depending on the additions and cancelations which have been made.

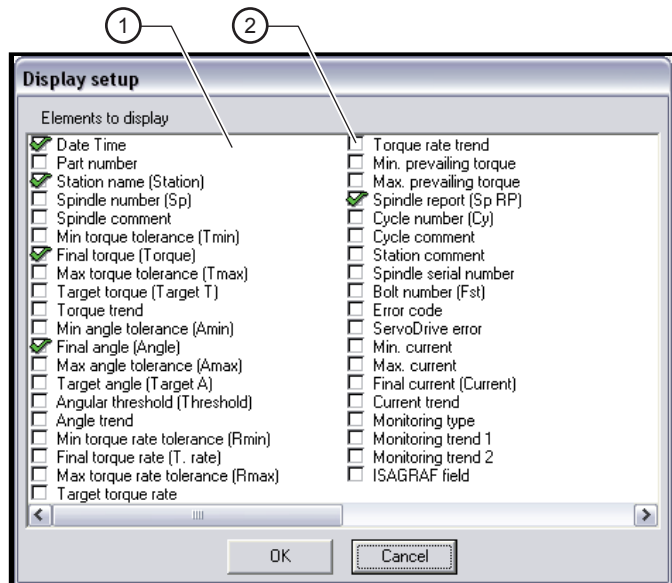


2.10 - Display setup

► Menu = Results / Setup

This screen allows you to select the data which must be displayed for a follow up in real time

The available data on display are:



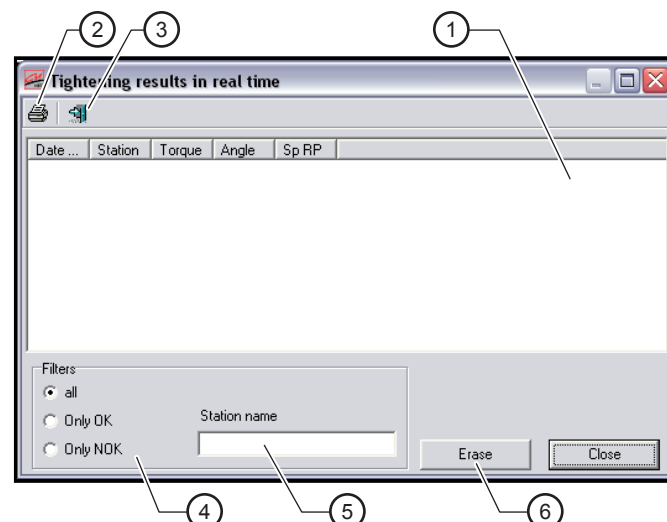
Legend

- 1 Elements to display
- 2 Checkbox

For each element there is a checkbox (2), to check in order to select/unselect for display.

2.11 - Display in real time of the results

► Menu = Results / Display in real time



Legend

- 1 Results
- 2 Print button
- 3 Exit button
- 4 Filters
- 5 "Station name" Filter
- 6 Erase button

This screen allows visualising results (1) step by step, as they are received by CVI Net Collector.

The new results are shown on top of the list: in the following way, the most recent results are visualised first, however you have the possibility of consulting older results by checking the list.

All the data to be displayed for a line of results is determined by the display setup screen.

Filters available (4), for the "spindle" reports:

- All.
- OK only.
- NOK only.

Filter on station name (5):

- If "Station name" is empty, then results for ALL controllers will be displayed.
- If "Station name" is not empty, then only results produced by the controller will be displayed.



The value entered in Station name field must match exactly a controller name.

If the value doesn't match any station name, any result won't be displayed.

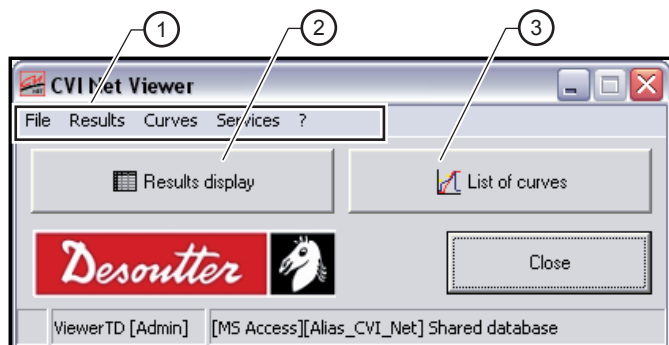
The results displayed on this screen can be printed by clicking on the "Print" button from the toolbar.

3 - CVI NET VIEWER MODULE

3.1 - Initiating the program

- Click on the menu "Start" from the Windows task bar.
- Move the arrow or your mouse up to "Programs".
- Select "CVI Net" in the program list.
- Click on "CVI Net Viewer" to start.

3.2 - Main screen



Legend

- 1 CVI Net Viewer menu
- 2 Result display button
- 3 List of curves button

Menus available on the main screen:

Menu	Submenu
File	Exit
Results	Setup (See §3.7, page 11)
	Display of the results (See §3.8, page 11)
	Assembly report (See §3.9, page 17)
	Launch a SQL query (See §3.10, page 18)
Curves	Setup (See §3.11, page 18)
	Curves list (See §3.12, page 19)
Services	Language of the software
	General parameters (See §3.4, page 9)
	Manage your login (See §3.6, page 10)
?	About...

3.3 - Selecting a language

► Menu = Services / Language of the software

You can change the language used for the menus and dialog boxes by selecting it in the list.

To do this, go to the menu "Services" then "Language of the software".

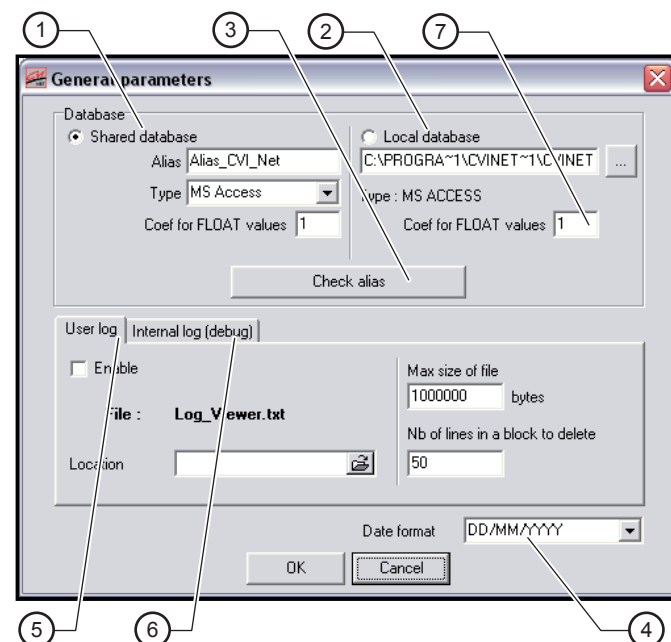
6 languages are currently available:

- English
- French
- German
- Spanish
- Chinese
- Japanese

Select your language and validate.

3.4 - General Parameters

► Menu = Services / General parameters



Legend

- 1 Shared database parameters
- 2 Local database parameters
- 3 Check alias button
- 4 Date format
- 5 User log
- 6 Internal log (debug)
- 7 "Coef for FLOAT values" parameter

This screen displays and allows to modify the following parameters:

3.4.1 - Alias of the database

Corresponds to the chain of characters which was defined when installing the ODBC driver, and his alias in the utility "BDE Administrator".



By default: "Alias_CVI_Net"

"Check Alias" button (2) allows to check if the alias entered is valid and if the connection to the base is possible.

3.4.2 - Date format

Selection of the display/capture format for dates.

Available formats:

- DD/MM/YYYY
- MM/DD/YYYY
- YYYY/MM/DD



By default: DD/MM/YYYY

3.4.3 - Switch between local and shared database

It's possible to choose between 2 ways to address data:

- Shared database (1) = access on network using DBMS (Oracle, SQL Server, MySQL,...).
- Local database (2) = MS Access file on local hard-disk.
- When "Shared database" (1) is checked, we must give alias name for database (ODBC source name), and the type of the database (MS Access, Oracle, SQL Server or MySQL).
- When "Local database" (2) is checked, we must give full pathname for the MS Access file. This file can be done by using 'Export to MS Access' from shared data.
- "Check alias" button (3) is available for both modes. It is used to check that the link to the database works.



"Coef for FLOAT values" (7) should only be changed in case of Oracle database – or data exported from Oracle database.

In fact, this is a way to avoid loss of decimal part for "float" values :

- Each value is multiplied by coef before storage into Oracle
- Each value is divided by coef after having been read, and before to be displayed or printed.

For example, coefficient 1000 will guarantee that we keep 3 decimals for float values.

3.5 - Events & Logs

- CVI Net gives 2 levels of event Log :
 - User log
 - Internal log (for Debug)
- 4 Log files are available :
 - Spy_Collector.txt & Spy_Viewer.txt for "Internal Logs".
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- Events stored in User Logs:
 - "Start application".
 - "Close application".
 - "Connect user", with login + privilege.
 - "Connect database :", with type of database / access mode / alias or pathname for local file.
 - "Disconnect database".
 - "Add authorization for :", with IP address of controller that has been added.
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- Events stored in Internal Logs
 - Contains information useful to analyze behavior of CVI Net (for debug only).

3.5.1 - How to use it

2 tabs are available:

- "User log" (4).
- "Internal log" (5).
- Only administrators can modify parameters in these tabs (members and Guests can only view Log parameters) .
- To enable Log, check "Enable" and fill in "Location" field with a valid directory.
- It is also possible to change max size of file or the number of lines to delete each time max size is achieved.

3.6 - User account

► Menu = Services / Manage your login

It is preferable to set up a user account to protect the data from handling errors.



The CVI Net Viewer user account is accessible only if created in the CVI Net Collector (See §2.7, page 6.)



To skip the login window on program launch:

- Right-click the program shortcut.
- Click the "Properties" option.
- Click the "Shortcut" tab.
- In the "Target" window, add the text "-usrpsw:user_name@password" to the end of the command line.

The User Account menu is used to display information concerning the active user.



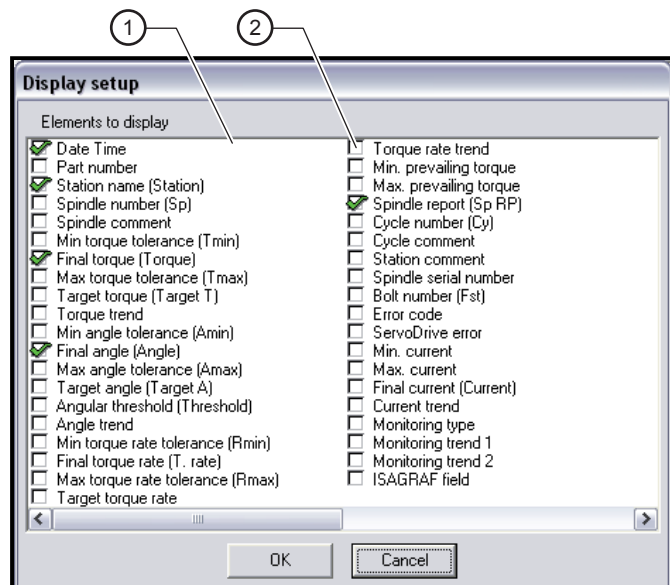
The user account password can be modified via this menu.

3.7 - Setup of the display of the results

► Menu = Results / Setup

This screen allows to choose the data to display for the tightening results.

The available data on display are:



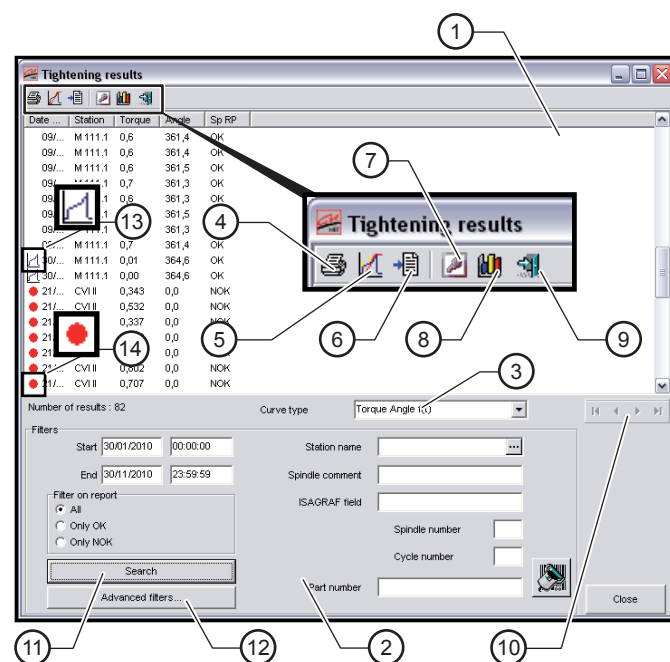
Legend

- 1 Elements to display
2 Checkbox

For each element there is a checkbox (2) to check in order to select/unselect for display.

3.8 - Display of the results

► Menu = Results / Display of the results



Legend

- 1 Results
2 Filters
3 Curve type
4 Print button
5 Display curves button
6 Export to text file button
7 Export to MSAccess file button
8 Statistics button
9 Close button
10 Navigation bar
11 Search button
12 Advanced filters button
13 Curve information available
14 Tightening NOK information

The columns shown here depend on the setup selected on the previous screen.



- The pictogram (13) indicates that a curve is available for the result.
- The pictogram (14) indicates a tightening NOK report.

To select results, we have a filter/selection area (2), with the following data entry fields:

- Beginning date and time (**)
- Ending date and time (**)
- Filter on the spindle report
 - All, only OK, Only NOK.
- Station name (*)
 - List of the station names available by clicking on the "..." button.
- Spindle comment (*)
- ISAGRAF field (*)
- Part number / VIN number (*)
 - It is possible to enter data using the keyboard or a bar code scanner.





(*) Alphanumeric data, which can be filtered using the joker*.

(**) The starting/ending time can only be entered when the starting date and the ending date are equivalent.

The "Search" button (11) launches a query in the database, to update the list of results depending on the filters.

The data can be sorted by clicking on the headers of the columns.

It is possible to select one or several results [Clic]+ [Ctrl], to launch the display of the curves associated, clicking on the button (5) in the tool bar.

Before the display of the curve, it is possible to choose the kind of curve in the pulldown menu (3).

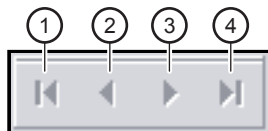
The different kinds available are:

- Torque versus time.
- Torque and angle versus time.
- Torque versus angle.
- Torque, angle and final torque versus time.
- Torque, angle and current versus time.

In the tool bar, the "Export to the text file" button (6) opens a dialog box which allows you to enter the name and the path of a file for receiving the list of the results as text.

In the tool bar, the "Print" button (4) opens a dialog box to choose the printer before starting printing.

3.8.1 - Navigation bar



Legend

- 1 First page button
- 2 Previous page button
- 3 Next page button
- 4 Last page button

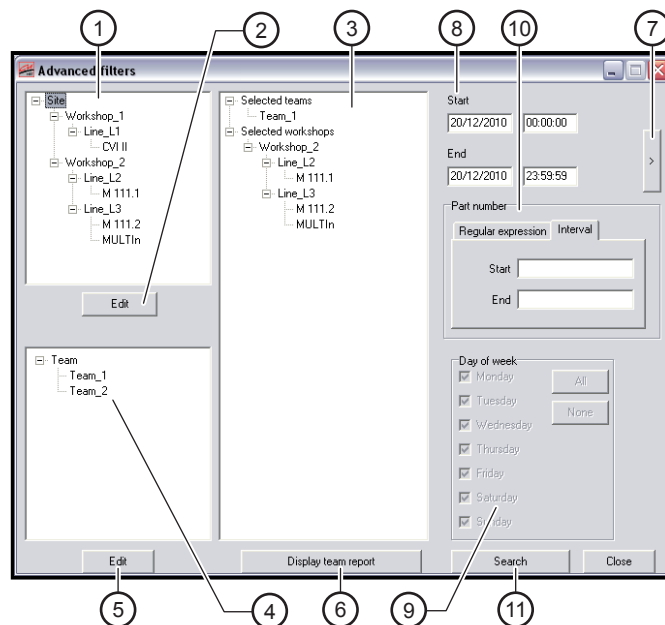
The navigation bar lets you display the results page by page.



1 page = 100 results.

3.8.2 - Advanced filter

The advanced filter lets you monitor productivity by work session.



Legend

- 1 Site window
- 2 Edit sites button
- 3 Selected teams window
- 4 Team window
- 5 Edit teams button
- 6 Display team report button
- 7 SQL code window display button
- 8 "Date and time" search
- 9 "Day of the week" search
- 10 "Part number" search
- 11 "Search" button

Advanced filters screen allows to fuse several types of filters :

- Search results using date & time (8).
- Search using Teams : Drag & Drop one or more teams (4) into "Selected teams" (3).
 - "Teams" are an easy way to define interval time to search results.
 - A "Team" can have up to 6 breaks : in that case, results returned by a "Team search" are the ones between Start and End, but excluding those done during the break(s). See "To create / manage teams", page 14.
- Search using day of the week (9).

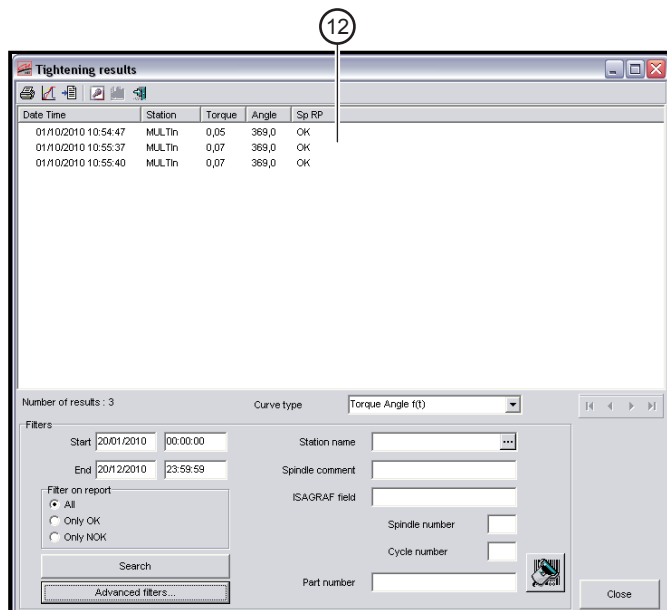


"Day of week" criteria is not available with MS Access database.
In that case, all check boxes are disabled.

- Search using "Area selection" : Drag&Drop line(s) or workshop(s) into selection list (3).
- Search using Part number (10):
 - Interval : search part number between "Start" and "End".
 - Regular expression: search part number using special characters "*" and "?".

Once conditions have been set, search is launched by clicking on "Search" button (11).

Results are displayed on "Basic search" screen (12).



Legend

12 "Basic search" screen

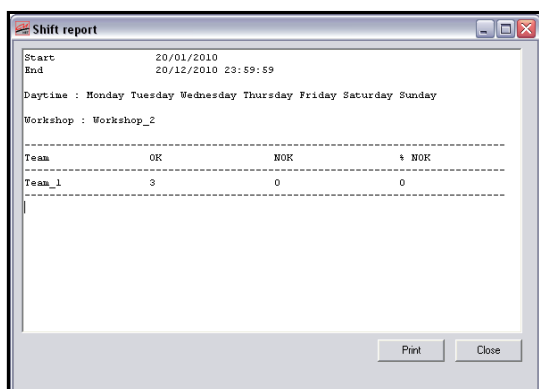
Then we can print, export, or launch statistics on this set of results.



In case of search using advanced filters, "Basic" filters are not taken into account.

Shift Report

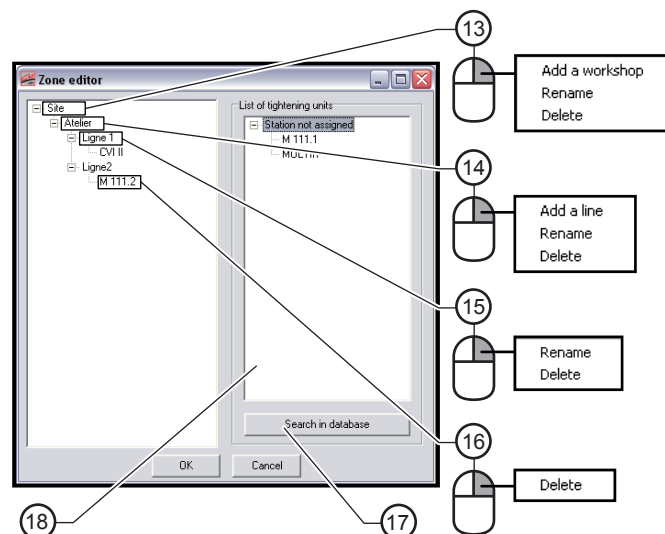
- Click the "Display team report" button (6).



- Available information :
 - Start and end [Date & time] : search time interval.
 - Daytime : selected days for this search.
 - For each selected team, number of OK results, number of NOK results, ratio for NOK results.

To manage site/ workshops / lines

- Click the "Edit" button (2).
- The following window is displayed:



Legend

13 List of sites

14 List of workshops

15 List of lines

16 List of stations

17 Search in database button

18 Available tightening units window

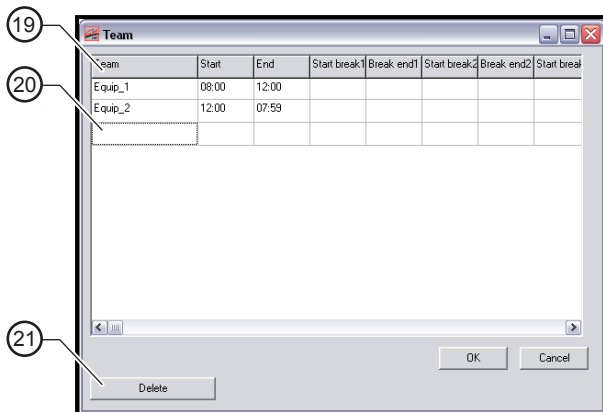
This screen allows to create / rename workshops and lines.

- To add a Workshop to a Site:
 - Right-click the Site (13).
 - Click the command "Add a workshop".
- To add a line to a workshop:
 - Right-click the workshop (14).
 - Click the command "Add a line".
- To delete a station from a line:
 - Right-click the station to be deleted (16).
 - Click the command "Delete".
- To add a station to a line:
 - Select a station from the list (18).
 - Drag/Drop the station to the required line.
- To allocate stations to lines:
 - Click on "Search in database" button (17) to refresh the list of available stations (This list will give non-assigned stations).
 - Drag&drop station, to assign to a line.



To create / manage teams

- Click the "Edit" button (5).
- The following window is displayed:



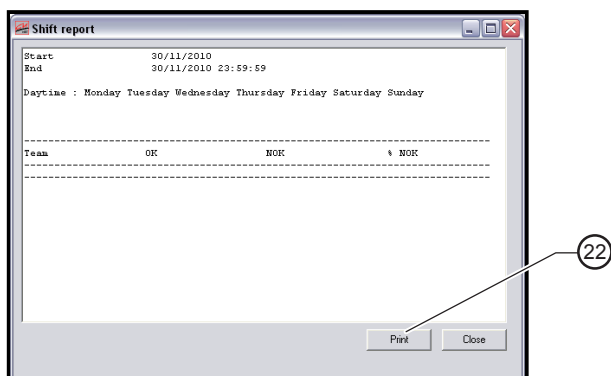
Legend

- 19 List of teams
20 Editing area
21 Delete button

- To add a new Team, fill in :
 - Name for the new team.
 - Time interval (Start & End).
 - Optional : start and end for breaks (up to 6 breaks).
- To Modify an existing Team :
 - Select the cell to change.
 - Modify current value.
 - Click on "OK" button.
- To delete an existing Team :
 - Select team name cell.
 - Press "DEL" key on keyboard.
 - Click on "OK" button, to confirm.

To display a team report:

- Click the "Display team report" button (6).
- The following window is displayed:



Legend

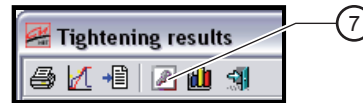
- 22 Print button

- Click the "Print" button (22) to print the report.

3.8.3 - Export to Access database

This function allows to store in an Access file, all results that have been selected.

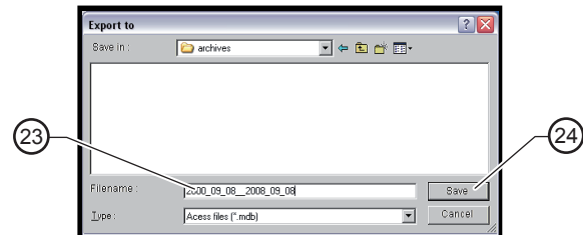
Then, this Access file will be used as local database (see Switch in database).



Legend

- 7 Export to MSAccess file button

After having launched a request containing at least one result, click on "Access" button (7) in the toolbar.



Legend

- 23 Name for the MSAccess file
24 "Save" button

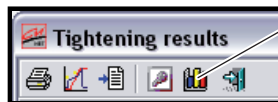
- Enter folder and name for the MSAccess file (23) (.mdb)
- Click on "Save" button (24) to export MSAccess file.
- The file is now ready to be read as local database.

3.8.4 - Statistics

This function allows to calculate statistics.

The maximum number of results that can be taken into account : up to 100 000.

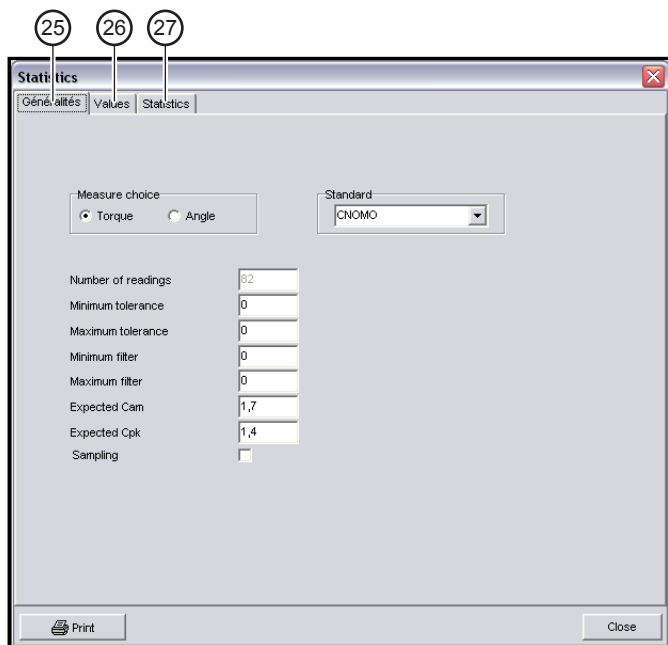
 Function "Statistics" is not available from advanced filters search.



Legend

8 Statistics button

Once having launched a search and got at least 1 result, click on "Statistics" button (8) in toolbar.



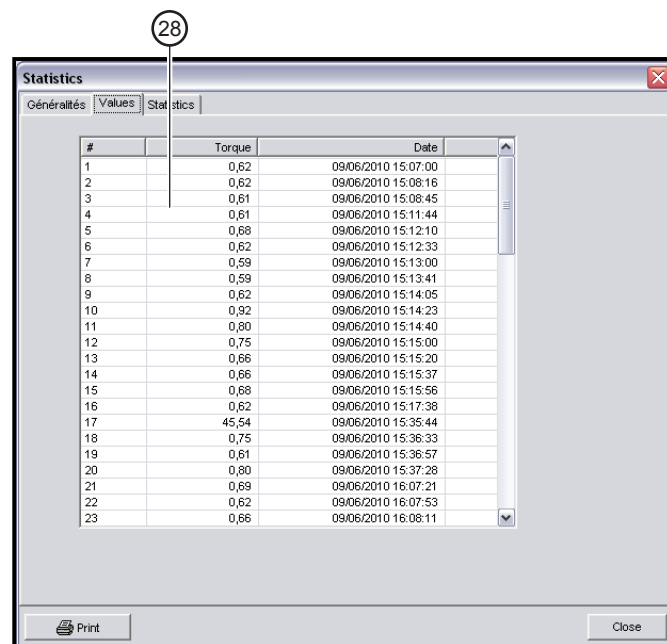
Legend

25 "General" tab

26 "Values" tab

27 "Statistic" tab

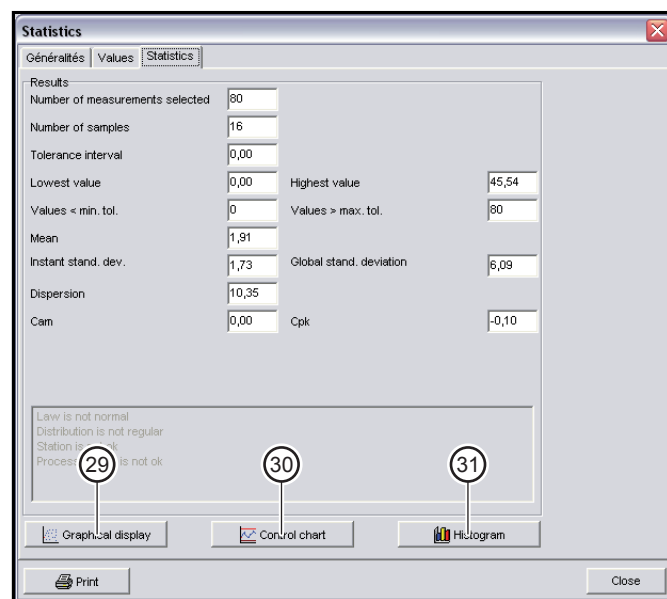
- Click on "Values" tab (26) to check list of results that will be taken into account.



Legend

28 list of results

- Click on "Statistics" tab (27) to display main statistical results.



Legend

29 "Graphical display" button

30 "Control chart" button

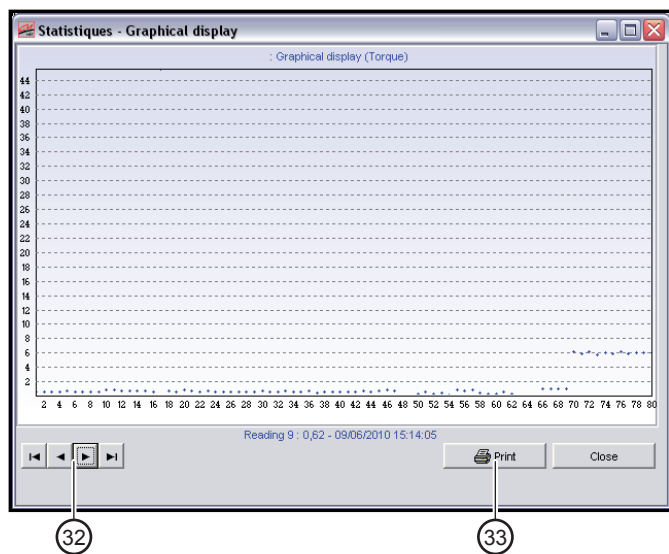
31 "Histogram" button

From that screen it's possible to access to following graphs :

- Scatter chart (graphical display) (29).
- Control chart (30).
- Histogram (distribution) (31).

Graphical display

- Click on "Graphical display" button (29) to display the following graphic:



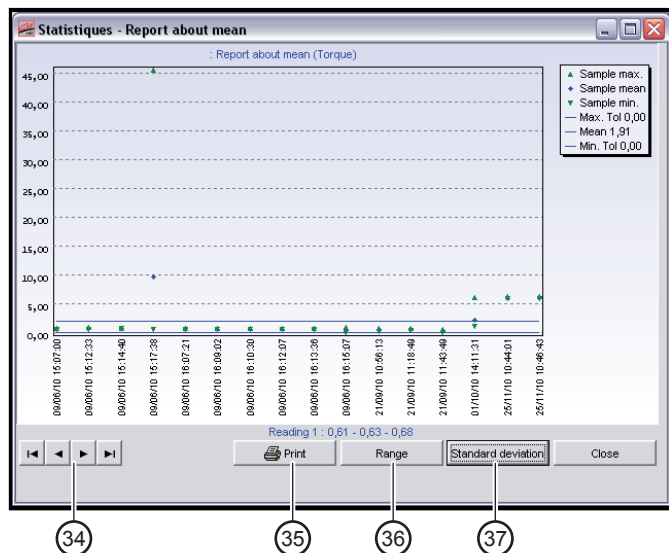
Legend

- 32 Navigation bar
33 "Print" button

- Use the navigation bar (32) to move the scale.
- Use "Print" button (33) to print the graphic.

Control chart

- Click on "Control chart" button (30) to display the following graphic:

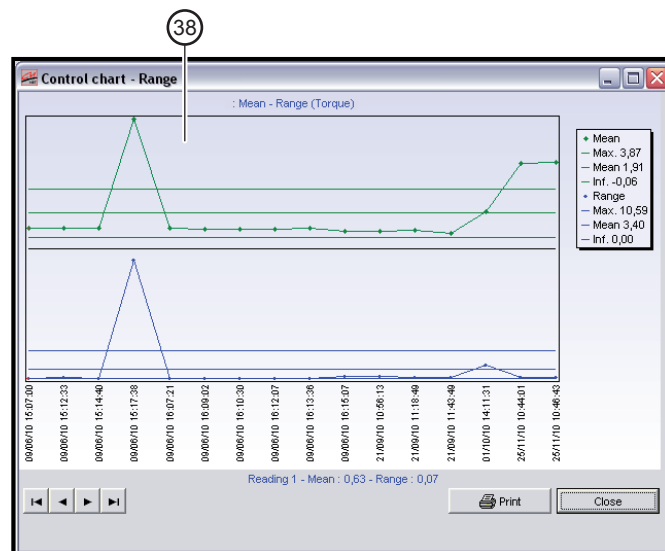


Legend

- 34 Navigation bar
35 "Print" button
36 "Range" button
37 "Standard deviation" button

- Use the navigation bar (34) to move the scale.
- Use "Print" button (35) to print the graphic.

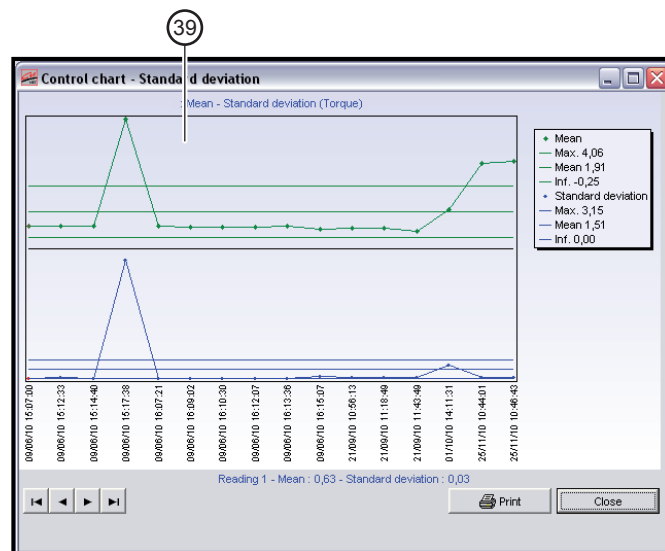
- Use "Range" button (36) to display the "Range" screen :



Legend

38 "Range" curve display

- Use "Standard deviation" button (37) to display the "Standard deviation" screen :

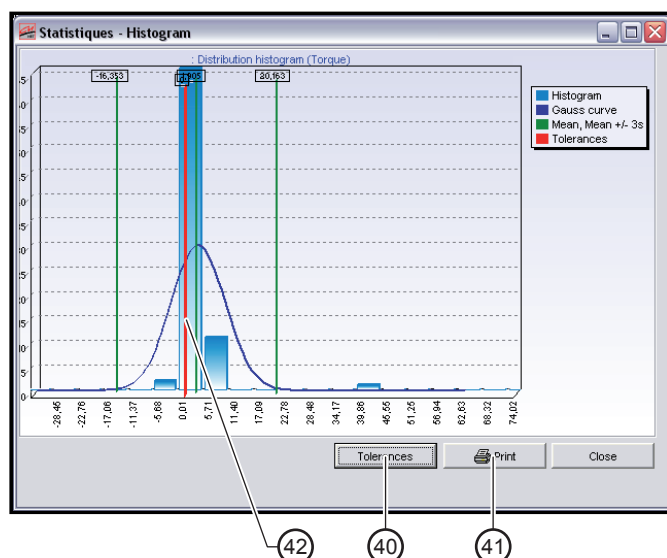


Legend

39 "Standard deviation" curve display

Histogram

- Click on "Histogram" button (31) to display the following graphic:



Legend

- 40 "Tolerance" button
- 41 "Print" button
- 42 Tolerance line

- Use "Print" button (41) to print the graphic.
- Use the "Tolerance" button (40) to display the "Tolerance" line (42).

3.9 - Assembly report

► Menu = Results / Assembly report

Legend

1 Assembly report

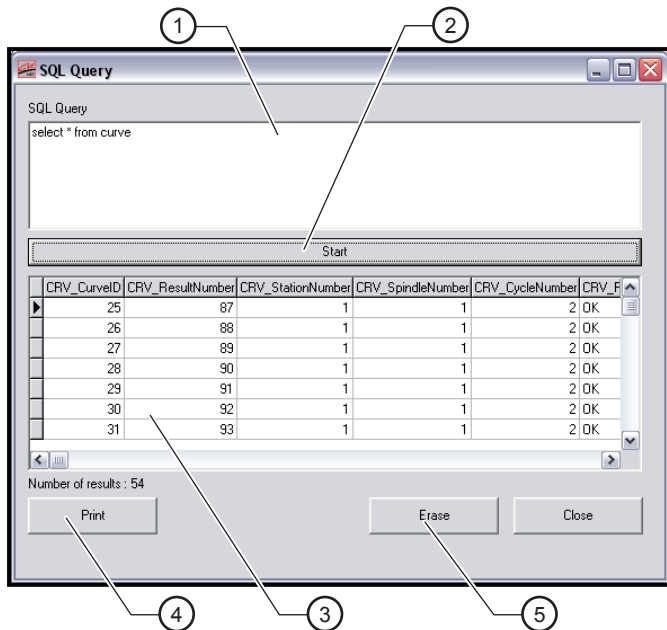
This screen is similar to the result display screen (See §3.8, page 11), but with a few differences:

- the filter area has two data entry fields for "Part number / VIN number".
 - It is possible to enter data using the keyboard or using a bar code scanner.
- The filter area does not include "Apply" button and the search for the tightening results is launched as soon as the VIN number is entered.
- The option "Automatic printing" allows to start printing a report as soon as you get display on screen; consequently, you do not have to click on the toolbar button.
- The option "Print the number of results" allows adding at the end of the edition the number of OK results, the number of NOK results and the total number of results.
- 2 data entry fields allow adding 2 lines of comments when editing the assembly report.
- The option "Export to the text file" allows to save a report as soon as you get display on screen; consequently, you do not have to click on the toolbar button. Select the location of the record of the report.

3.10 - Launching an SQL query

► Menu = Results / Launching an SQL query

In order to allow a user who knows the SQL language to make personalised queries, a screen is available in CVI Net Viewer.



Legend

- 1 SQL code input area
- 2 Start button to execute SQL query
- 3 Result display area
- 4 Print button
- 5 Erase button

This screen shows:

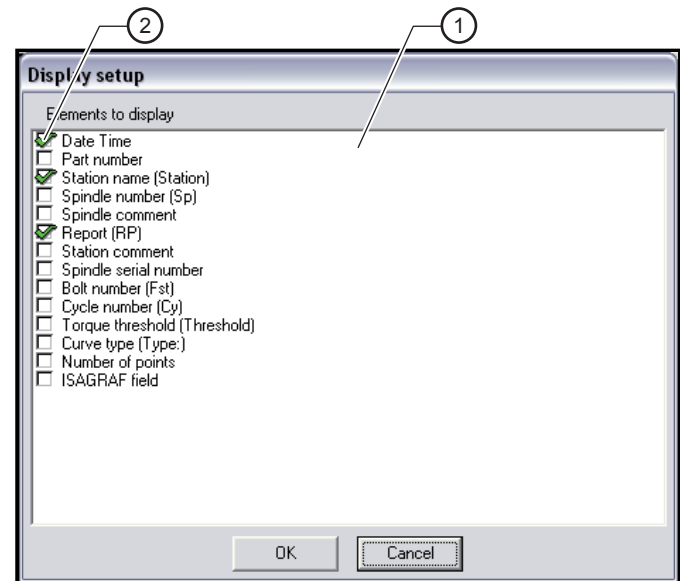
- An entry field (1) for the SQL code to execute.
- A button to "Execute SQL query" (2) for sending the entered code to the database management system (DBMS).
- A display area for the results of the SQL query (3).
- A "Print" button (4) to print the result of the query.

3.11 - Setup of the display of the curves

► Menu = Curves / Setup

This screen allows selecting the data to be displayed in the list of curves.

The available data on display are:



Legend

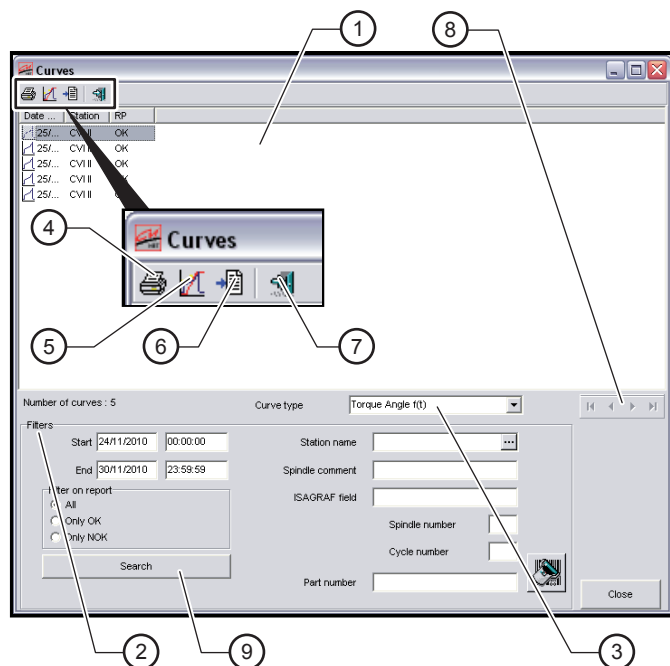
- 1 Elements to display
- 2 Checkbox

For each element (1) there is a checkbox (2) to check in order to select/unselect for display.

3.12 - List of curves

► Menu = Curves / List of curves

This screen displays the list of curves stored in the database.



Legend

- 1 Results
- 2 Filters
- 3 Curve type
- 4 Print button
- 5 Display curves button
- 6 Export to text file button
- 7 Close button
- 8 Navigation bar
- 9 Search button

The displayed column corresponds to checked data on the setup screen.

To select results, we have a filter/selection area (2), with the following data entry fields:

- Beginning date and time (**)
- Ending date and time (**)
- Global report
 - All, Only OK, Only NOK.
- Station name (*)
 - List of the station names available by clicking on the "...".
- Spindle comment (*)
- ISAGRAF field (*)
- Part number / VIN number (*)
 - It is possible to enter data using the keyboard or a bar code scanner.



(*) alphanumeric data, which can be filtered using the joker *

(**) the starting/ending time can only be entered when the starting date and the ending date are equivalent.

The "Search" button (9) launches a query in the database, to update the list of curves depending on the filters.

The data can be sorted by clicking on the headers of the columns.

Before displaying the curve, it is possible choosing the kind of curve in the pulldown menu (3) located over the filter area.

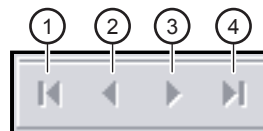
The different kinds available are:

- Torque versus time.
- Torque and angle versus time.
- Torque versus angle.
- Torque, angle and final torque versus time.
- Torque, angle and current versus time.

In the tool bar, the "Export to the text file" button (6) opens a dialog box which allows you to enter the name and the path of a file for receiving the list of the curves as text.

In the tool bar, the "Print" button (4) opens a dialog box to choose the printer before starting printing.

3.12.1 - Navigation bar



Legend

- 1 First page button
- 2 Previous page button
- 3 Next page button
- 4 Last page button

The navigation bar lets you display the curves page by page.

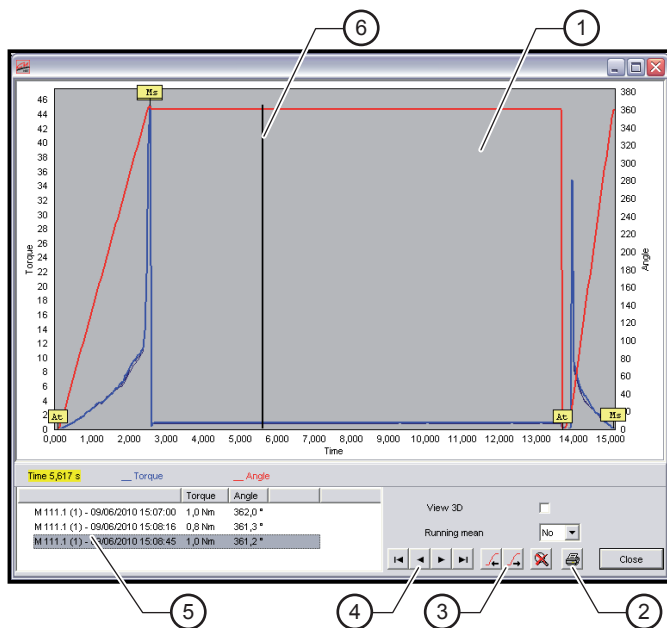


1 page = 100 curves.



3.12.2 - Curves display

To display the curves, you must select the curve(s) to be displayed (multiple selection is available: click on [Ctrl]) + button "Display the curves" in the toolbar.



Legend

- 1 Curve display window
- 2 Print button
- 3 Curve slide buttons
- 4 Cursor control buttons
- 5 Displayed curves information area
- 6 Cursor

The screen displaying the curves has a "Print" button (2) which launches printing of what is displayed on screen.

- The displayed curves information area (5) lets you view the current values according to the position of the cursor (6).
- To move the cursor (6), use the buttons (4).
- To adjust the time axis of a curve:
 - Select a curve (5).
 - Use the slide buttons (3) to adjust the scale.

3.13 - Auto-archive option

CVI Net Viewer provides a new command line :

- -autoArchive:firstDate@nbOfDays@"[archive fullpathname]"

This option is used to easily archive a set of results.

This option takes 3 parameters :

- firstDate:
 - Beginning of interval, (beginning time = 00:00:00) => nb of days between current date and first day to consider (See 3.13.1).
- nbOfDays:
 - Number of days for the time interval to archive (ending time = 23:59:59) (See 3.13.1).
- fullpathname:
 - Directory to store the archive-file.
 - This directory must exists, and the parameter must have quotes in case of blank in the fullpathname.

The filename for archive is built with first date and last date, depending on date format used by CVI Net Viewer.

3.13.1 - Example 1

- If current date is = "27th january 2008";
- If beginning of archive = "8th january 2008" => firstDate = 27 - 8 = 19
- If end of archive = "20th january 2008" => nbOfDays = 20 - 8 + 1 = 13

Finally, command-line would be :

- C:\Desoutter\CVI Net\CVI_Net_Viewer.exe -usrpsw:myLogin@myPassword -autoArchive:19@13@"C:\Desoutter\CVI Net\Archives"

Once this command-line has been performed, following file is created :

- C:\Desoutter\CVI Net\Archives\2008_01_08_2008_01_20.mdb



'-autoArchive' option would trace events if "User log" is enabled.

3.13.2 - Example of trace written by '-autoArchive' option

2008/11/28 15:05:00

```

2008/11/28 15:05:00 Start application
2008/11/28 15:05:00 Connect user sbu (Admin)
2008/11/28 15:05:00 Connect database: [Type = Oracle]
[Mode = Shared] [Alias =cvl oracle XE]
2008/11/28 15:05:00 Application started with option
-autoArchive:3251@13@D:\Appli\Prj\CVI_Net\archives\
test export auto
2008/11/28 15:05:00 Export successfully done to Access
file :
D:\Appli\Prj\CVI_Net\archives\test export auto\2000-01-
04_2000-01-16.mdb
2008/11/28 15:05:00 Disconnect database
2008/11/28 15:05:00 Close application

```



'-autoArchive' option will close application after having processed, whatever the result of the exportation (succeeded or failed).

3.14 - Install database for User Privileges

To be able to manage user privileges, we must install a dedicated MS ACCESS database.



This MS ACCESS database is automatically installed with CVI NET.

Script to create user privilege database:

```
CREATE TABLE USERS
```

```
(
```

```

    USER_Login varchar(50),
    USER_Application int,
    USER_Name varchar(50),
    USER_Privilege int
    USER_Password varchar(32),
    USER_Creation timestamp
    USER_LastPwdChange timestamp

```

```
)
```

```
ALTER TABLE USERS ADD PRIMARY KEY (USER_
Login,USER_Application);
```

Following user must be authorized to read records into the database :

- Login: "USERDB_Login"
- Password: "USERDB_Pwd"



This login + password is 'hard-coded' in CVI Net Viewer and Collector, to access to user privilege database.

We must also create an ODBC link on user privilege database.

The name for this ODBC link must be 'CVI_Users'.

3.14.1 - Specific case : User privilege database on MS Access file

We provide a ready-to-use MS Access file, available after Viewer or Collector has been installed :

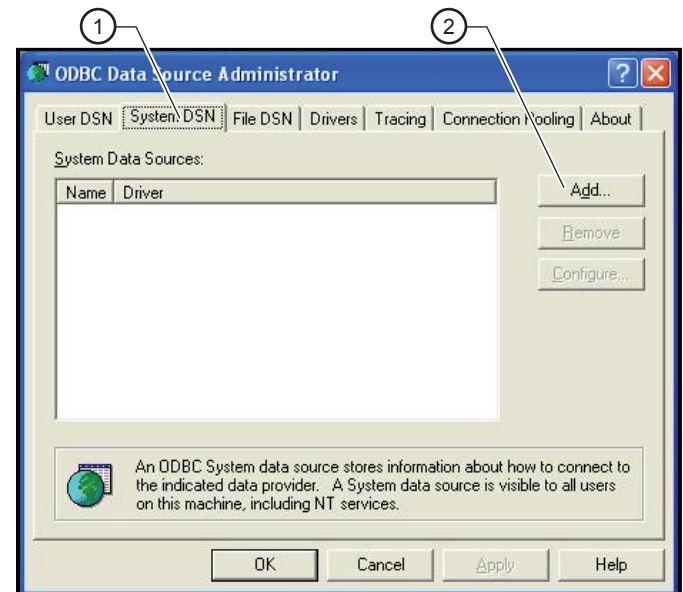
- File = [Viewer or Collector directory]\Schema\Users.mdb

This file should be copied into a folder that is readable by every users.

Finally, "CVI_Users" ODBC link must be create on each PC.

Example :

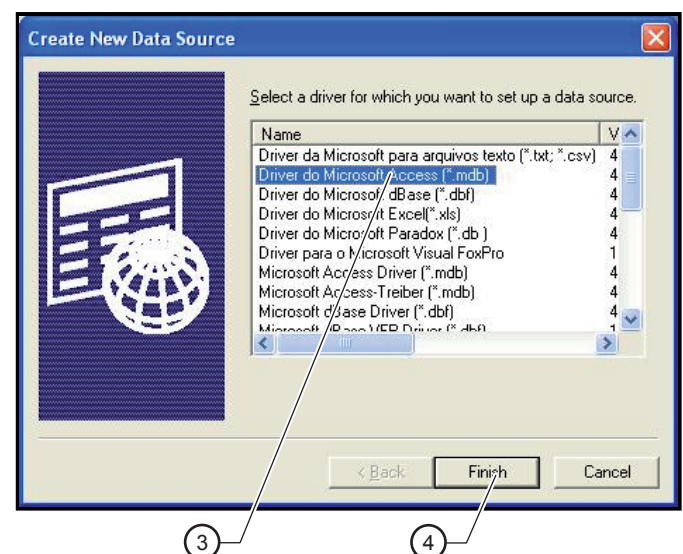
Control Panel\Administrative Tools\ Data Sources (ODBC) :



Legend

- 1 "System DNS" tab
- 2 "Add" button

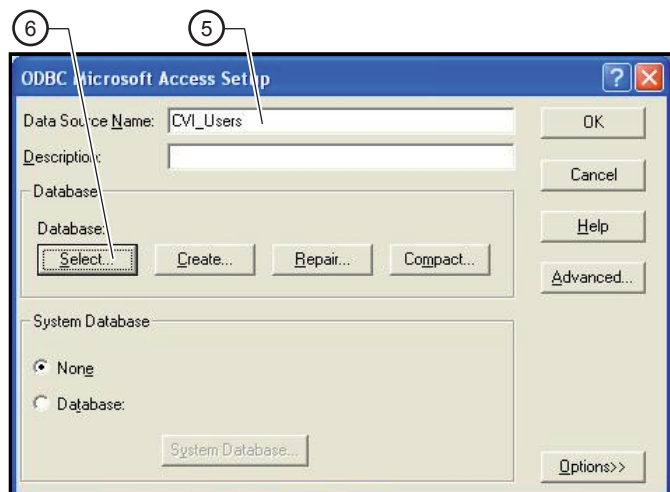
- Click on "System DSN" tab (1).
- Click on "Add" button (2).



Legend

- 3 Microsoft Access driver
- 4 "Finish" button

- Select "Driver do Microsoft Access (*.mdb)" (3) and click "Finish" (4) button.

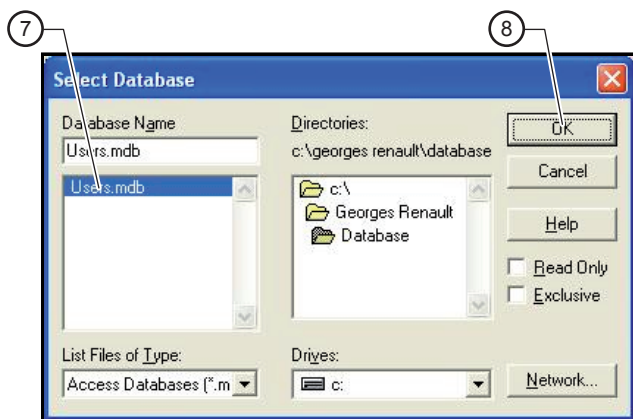


Legend

5 "Data Source Name" field

6 "Select" button

- Write "CVI_Users" in Data Source Name field (5), and click on "Select" (6) button.



Legend

7 "Users.mdb" database

8 "OK" button

- Select the "Users.mdb" (7) database copied before, and click on "OK" button (8).
- Close different form by "OK" button.

4 - PROGRAMMING THE TIGHTENING CONTROLLER FOR CVI NET

CVI includes a new programming screen dedicated to communicate with CVI Net (provided that the CVI is equipped with an Ethernet card).

That screen is available through:

► *Parameters / Peripherals / Network Data Collector*

This screen allows to program the following options:

Sending results:

- Yes / No

Sending curves OK:

- Yes / No (not available for multi-CVI).

Sending curves NOK:

- Yes / No (not available for multi-CVI).

Alarm threshold : XXX%

- This variable allows to specify the filling rate of the memory which launches the updating of a variable which is available through ISAGRAF.
- This threshold is programmed as %.
- As soon as the filling rate of the FIFO goes over this threshold, an alarm can be operated through a specific ISAGRAF application.
- This alarm warns the operator that the data collection is not working properly any longer. The operator has time enough to take action but does not always have to stop production.

Locking on when FIFO is full : Yes / No

- Allows to specify the action to take when the storage memory of results is full:
 - When locking on = yes, then launching a new cycle is blocked. "Ready" of the controller becomes "0", and controls "Start Cycle Tightening" are rejected. An error message is displayed on the control screen.
 - When locking on = no, you can launch a cycle but the new tightening will not be saved.

Time synchronisation:

- The time of each controller can slightly vary with time.
- This is why it might be advisable synchronising the hour of all the controllers.
- However, this functionality can also be fulfilled by the CVIPC2000 software. This software programs data and collects results. Another PLC could do the same.



The sending of curves is not available for the multi-CVI.



- As curves share the same storage space as tightening results, if the sending options of the curves are checked, time of disconnection before saturation of storage memory shall decrease considerably.
- Curves are send in standard format: composed of 500 points maximum.

4.1 - Visualisation of CVI Net function

Key [F1] on previous screen allows the operator to access a maintenance screen on which certain data can be displayed in real time (updated filling rate of storage memory of results, connection of CVI, locking on of CVI...).



5 - STRUCTURE OF THE DATABASE

Tightening results:

- Station data table + Spindle data table.

Curves :

- Curve data table + Curve point table.

5.1 - Station data table: STATION

Field	Description	Type
STA_ResultID	Result identifier (self-incremental)	*INTEGER
STA_ResultNumber	Result number = 0 to 65535	INTEGER
STA_StationNumber	Station number = 1 or 2	SMALLINT
STA_Report	"OK" / "NOK"	VARCHAR(3)
STA_VIN	Vehicle identification number	VARCHAR(30)
STA_CycleNumber	Cycle number = 1 to 250	SMALLINT
STA_CycleOKProgrammed	Number of OK cycles programmed- 1 to 999	SMALLINT
STA_CycleOKCount	Count of number of cycles OK -0 to 999	SMALLINT
STA_TorqueUnit	Torque unit: Nm=0/ FtLb=1 / InLb=2 / Kgm=3 / Kgcm=4	SMALLINT
STA_StationName	Station name	VARCHAR(12)
STA_StationComment	Station comments	VARCHAR(26)
STA_SpindleCount	Number of spindles = 1 to 32	SMALLINT
STA_DateTime	Tightening(s) date and time	TIMESTAMP
STA_CycleComment	Cycle comments	VARCHAR(40)



Field STA_ResultID is the primary key of the STATION table.

5.2 - Spindle data table: SPINDLE

Field	Description	Type
SPI_ResultID	Result identifier (foreign key)	*INTEGER
SPI_SpindleNumber	Spindle number = 1 to 32	*oSMALLINT
SPI_PhaseNumber	Phase number = 0 to 20	SMALLINT
SPI_SpindleSerialNumber	Spindle serial number	VARCHAR(10)
SPI_SpindleComment	Spindle comment	VARCHAR(15)
SPI_BoltNumber	Bolt number = 3 characters	VARCHAR(3)
SPI_Isagraf	Field for Isagraf	VARCHAR(40)
SPI_ErrorCode	Allows to codify errors (3)	SMALLINT
SPI_ServoDriveError	Error code for servo drive fault	SMALLINT
SPI_ResultType	Allows to decode type of result (1)	SMALLINT
SPI_SpindleReport	Report per spindle = "" / "OK" / "NOK"	VARCHAR(3)
SPI_TorqueAccuracy	Accuracy for torque values (number of decimals)	SMALLINT
SPI_TorqueTarget	Torque target	NUMERIC(9,3)
SPI_TorqueMinTolerance	Torque minimum tolerance	NUMERIC(9,3)
SPI_TorqueMaxTolerance	Torque maximum tolerance	NUMERIC(9,3)
SPI_FinalTorque	Final torque = torque result	NUMERIC(9,3)
SPI_InfTorque	Inferior prevailing torque measured	NUMERIC(9,3)
SPI_SupTorque	Superior prevailing torque measured	NUMERIC(9,3)
SPI_AngleThreshold	Torque launching angular count (of the last phase)	NUMERIC(9,3)
SPI_TorqueTrend	Torque trend = No result=0 /weak=1 / strong=2 / good=3	SMALLINT
SPI_AngleTarget	Angle target	NUMERIC(9,3)
SPI_AngleMinTolerance	Angle minimum tolerance	NUMERIC(9,3)
SPI_AngleMaxTolerance	Angle maximum tolerance	NUMERIC(9,3)
SPI_FinalAngle	Final angle = angle result	NUMERIC(9,3)
SPI_AngleTrend	Angle trend = No result=0 /weak=1 / strong=2 / good=3	SMALLINT
SPI_TorqueRateTarget	Torque rate target in % (integer between 1 and 100)	NUMERIC(9,3)
SPI_TorqueRateMinTolerance	Torque rate minimum tolerance	NUMERIC(9,3)
SPI_TorqueRateMaxTolerance	Torque rate maximum tolerance	NUMERIC(9,3)
SPI_FinalTorqueRate	Final torque rate = torque rate result	NUMERIC(9,3)
SPI_TorqueRateTrend	Torque trend = No result=0 /weak=1 / strong=2 / good=3	SMALLINT
SPI_MinCurrent	Minimum current measured	NUMERIC(9,3)
SPI_MaxCurrent	Maximum current measured	NUMERIC(9,3)
SPI_FinalCurrent	Final current = current result	NUMERIC(9,3)
SPI_CurrentTrend	Current trend = No result=0 /weak=1 / strong=2 / good=3	SMALLINT
SPI_MonitoringType	Monitoring type (2)	SMALLINT
SPI_Monitoring1Trend	Monitoring trend 1 → none=0 /weak=1 / strong=2 / good=3	SMALLINT
SPI_Monitoring2Trend	Monitoring trend 2 → none=0 /weak=1 / strong=2 / good=3	SMALLINT



The SPI_ResultID field is a foreign key and it corresponds to the STA_ResultID field of the STATION table.



(1)

Type of results/see also the RESULT_TYPE table:

- 1 Search sequence
- 2 RunDown speed
- 3 Default phase
- 4 Prevailing torque phase
- 20 Torque-controlled tightening
- 21 Torque-controlled tightening + angle
- 22 Torque-controlled tightening + angle + tension
- 23 Torque-controlled tightening + angle + final torque
- 24 Angle-controlled final speed phase
- 25 Angle-controlled final speed phase + tension
- 26 Tension-controlled tightening + torque + angle
- 27 Yield point-controlled tightening
- 28 Tension-controlled tightening + yield point
- 29 Clamping tightening
- 30 Angle-controlled final speed phase + final torque
- 40 Torque-controlled loosening
- 41 Torque-controlled loosening + angle
- 42 Angle-controlled run reverse + torque



(2)

Monitoring types/see also the MONITORING_TYPE table:

- 0 None
- 1 Current (monitoring 1 = A)
- 2 Tension
- 3 Torque (Monitoring 1=+/-%)
- 4 Torque & Angle (Monitoring 1=+/-%, Monitoring 2=+/-°)



(3)

Error codes/see also the ERROR_CODE table:

- 0x0001 Reject for grouped spindle
- 0x0002 Down start cycle
- 0x0004 Maximum time reached
- 0x0008 Torque or maximum spindle current reached
- 0x0010 Cycle non finished
- 0x0020 Default of synchronisation between controllers
- 0x0040 External stop detected
- 0x0080 Internal stop

5.3 - Curve data table: CURVE

Field	Description	Type
CRV_CurveID	Curve Identifier - + 1 self-incremental	*INTEGER
CRV_ResultNumber	Result number = 0 to 65535	INTEGER
CRV_StationNumber	Station number = 1 or 2	SMALLINT
CRV_SpindleNumber	Spindle number = 1 to 32	SMALLINT
CRV_CycleNumber	Cycle number = 1 to 250	SMALLINT
CRV_Report	Global report= "OK" / "NOK"	VARCHAR(3)
CRV_TorqueUnit	Torque unit: Nm=0/ FtLb=1 / InLb=2 / Kgm=3 / Kgcm=4	SMALLINT
CRV_TorqueAccuracy	Accuracy for torque values (number of decimals)	SMALLINT
CRV_Datetime	Date and time of registration of the curve	TIMESTAMP
CRV_TorqueThreshold	Torque threshold of the curve	NUMERIC(9,3)
CRV_PointDuration	Duration for 1 point of the curve, in micro-seconds	SMALLINT
CRV_VIN	Vehicle identification number	VARCHAR(30)
CRV_StationName	Station name	VARCHAR(12)
CRV_StationComment	Station comments	VARCHAR(26)
CRV_SpindleComment	Spindle comments	VARCHAR(15)
CRV_SpindleSerialNumber	Spindle serial number	VARCHAR(10)
CRV_BoltNumber	Bolt number	VARCHAR(3)
CRV_Isagraf	Field for Isagraf	VARCHAR(40)
CRV_CurveType	Measurements type registered	SMALLINT
CRV_PointCount	Count of points in the curve	SMALLINT



Field CRV_CurveID is the primary key of table CURVE.



A curve is linked to a result by this composed relation:

STA_ResultNumber <-> CRV_ResultNumber
 STA_StationName <-> CRV_StationName
 SPI_SpindleNumber <-> CRV_SpindleNumber
 STA_DateTime <-> CRV_DateTime

This relation can be written in SQL-language:

```

SELECT CRV_CurveID
FROM CURVE, STATION, SPINDLE
WHERE (STA_ResultID = :ResultID)
AND (SPI_SpindleNumber = :SpindleNumber)
AND (SPI_ResultID = STA_ResultID)
AND (CRV_SpindleNumber = SPI_SpindleNumber)
AND (CRV_ResultNumber = STA_ResultNumber)
AND (CRV_StationName = STA_StationName)
AND (CRV_DateTime = STA_DateTime);
  
```

5.4 - Table points of curve: CURVE_POINT_BLOB

Field	Description	Type
CRVPT_CurveID	Curve identifier (foreign key)	INTEGER
CRVPT_BlobFormat	Format code for Blob field	SMALLINT
CRVPT_Points	Blob containing points data	BLOB



Data for each point, in CRVPT_Points filed, for the type 1 (CRVPT_BlobFormat) .

Data	Type	Size in bytes
Index for point (index = 1, for first point)	SHORT	2
Torque value	DOUBLE	8
Angle value	DOUBLE	8
Torque rate value	DOUBLE	8
Current value	DOUBLE	8
Marker value (1)	SHORT	2



(1)
0x0001 = Start of prevailing torque.
0x0002 = Motor stop.
0x0004 = Angle threshold.

5.5 - Table of current indexes (results and curves) : MAX_ID

Field	Description	Type
MAXID_TableName	Name of table	VARCHAR(50)
MAXID_CurrentMaxId	Current ID value	INTEGER

5.6 - Table of the possible code kinds for the results: RESULT_TYPE

Field	Description	Type
RSLT_ResultTypeID	Result type ID	INTEGER
RSLT_ResultTypeLabel	Result type label	VARCHAR(100)



This table is fully completed during installation with script.

5.7 - Table of the possible code kinds for the monitoring: MONITORING_TYPE

Field	Description	Type
MNTG_MonitoringTypeID	Monitoring type ID	INTEGER
MNTG_MonitoringTypeLabel	Monitoring type label	VARCHAR(100)



This table is fully completed during installation with script.

5.8 - Table of the error codes:

ERROR_CODE

Field	Description	Type
ERRCD_ErrorID	Error ID	INTEGER
ERRCD_ErrorLabel	Error label	VARCHAR(100)



This table is fully completed during installation with script.

5.9 - Geographical filter table

5.9.1 - WORKSHOP table

Field	Description	Type
WKS_Id	Internal WORKSHOP ID	* INTEGER
WKS_Label	WORKSHOP name	VARCHAR(50)

5.9.2 - LINE table

Field	Description	Type
LIN_Id	Internal LINE id	* INTEGER
LIN_Label	LINE name	VARCHAR(50)
WKS_Id	ID of the WORKSHOP owning the line	INTEGER

5.9.3 - TJ_STATION_LINE table

Field	Description	Type
TJS_Id	Internal join ID	* INTEGER
STA_StationName	STATION name	VARCHAR(50)
LIN_Id	ID of the line owning the STATION	INTEGER

5.10 - Temporal filter table

5.10.1 - SHIFT table

Champ	Description	Type
SH_Id	Internal SHIFT ID	* INTEGER
SH_Label	SHIFT name	VARCHAR(50)
SH_StartTime	Start time of the SHIFT	TIMESTAMP
SH_EndTime	End time of the SHIFT	TIMESTAMP

5.10.2 - BREAK table

Field	Description	Type
BR_Id	Internal break ID	* INTEGER
BR_Start	BREAK start time	TIMESTAMP
BR_End	BREAK end time	TIMESTAMP
SH_Id	ID of SHIFT containing the BREAK	INTEGER

5.11 - Table of the list of stations:

STATION_NAME

Field	Description	Type
STANAME_Name	STATION name	VARCHAR(12)

5.12 - Adding index on this database

To improve query performances in CVI Net Viewer, we recommend to add following index :

STATION table

```
CREATE INDEX STA_STATIONNAME_IDX ON  
STATION (STA_StationName);
```

```
CREATE INDEX STA_DATE_RSLTNB_NAME_IDX ON  
STATION (STA_DateTime, STA_ResultNumber, STA_  
StationName);
```

SPINDLE table

```
CREATE INDEX SPI_SPINDLE_ID_IDX ON SPINDLE  
(SPI_ResultID, SPI_SpindleNumber);
```

5.13 - Creation scripts

The basic creation scripts can be found on the CDRom supplied by Desoutter.

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