

CRYSTAL XE

Cloud & Mobile XE manual



Date (jj/mm/yyyy)	Rev	Description
17/07/2019	3	Add history log in the cloud. Customize your own server
28/04/2017	2	Android application is now in the google play store
08/03/2017	1	Creation

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1 PREFACE

1.1 Audience

The Riber Crystal XE software is a very versatile and expandable environment for the control of MBE, CBE and similar growth systems but not only.

This guide is intended for users who want to share data managed by Crystal XE software with mobile devices and/or windows client software.

1.2 Documentation accessibility

This document and its latest version can be downloaded on the Crystal XE website at : <http://www.crystalxe.com> in the section My CrystalXE

You will need to create an account to access to My CrystalXE. A guide on how to do this is included on the Riber web site, and you will be requested to provide basic details. This account will be then activated by the Riber team. Once this administrative process has been completed, you will be able to access the relevant information, as shown in the figure below. Registering will also provide you with the option of being kept informed of developments and upgrades to the software, and to other Riber systems.

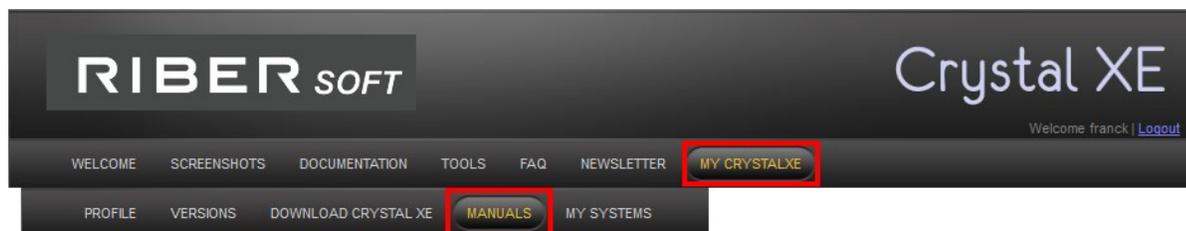


Figure 1: Access to the manual on the Riber Crystal XE website

1.3 Related documents

For more information, see the Crystal XE user manual which can be also downloaded at www.crystalxe.com in the section My CrystalXE.

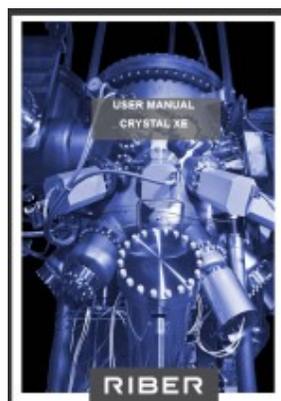


Figure 2: Crystal XE User Manual

2 Presentation

The cloud is stored in a MySQL data base located in a secured server.

This data base stores a mirror of the main data of Crystal XE. **No recipe or other confidential data are stored in the data base.**

Crystal XE uses the default template of the data recorder to select which data to share on the cloud.

This data base is accessible by an Internet browser, by a mobile application or by a windows client application through an **encrypted SSL** connection.

For security reason, the data are sent by Crystal XE to the cloud and never in the other way. **It is not possible to send data to the crystal computer, so it is not possible to control the system remotely.**

How to proceed in a few steps?

- The computer on which Crystal XE is running must be connected directly to the Internet or through a proxy or a router.
- You must have created an account on the Crystalxe.com web site.
- In the main menu of Crystal XE, go in Setup / Options and in the Cloud tab, fill in the fields, then push the test button and activate the cloud.
- To read all data in real time from another computer, go to www.crystalxe.com, click on My CrystalXE and My Systems. A mobile application is available for Android and also a windows client application.

3 Confidentiality and security

3.1 Server

The server is located in a secured data center in France.

The provider is OVH (<https://www.ovh.com>)

Since version 2.01 build 5, it is possible to use your own server. In this case, you must specify the full URL of your server in the options window. On request, we have a procedure to install a WAMP server (Windows Apache MySQL PHP)

3.2 Data sent to the server

The connection between Crystal and the server uses the SSL cryptographic protocols that provide communications security over the network. In addition of the SSL protocol, the password is also encrypted. The password is stored in the data base with a one way encryption algorithm. It is not possible to read a password. That's why you need to replace the password if you loose it by requesting a new one on the CrystalXE web site.

What data are sent to the server?

During the connection, Crystal XE sends:

- The login name
- The password
- The system name

Then when the connection is established, periodically (by default one second), it sends

- Data which are defined in the default **template recorder**
- **Recipe tags**: StartTime, LayerNumber, Status (running, pause or stopped), ElapsedTimeMS, TotalDurationMS and LayerCount.
- **Global variables**: if defined, the list of global variables (values and names).
- **Main tags**: CPU_Usage, DiskSpace, ErrorStatus, MemorySpace, ProgramDirectory, ProjectDirectory, ProjectTile, Tag, UnitPressure, UnitTemperature.
- **Batch tags**: Delayed, DelayedTime, InfiniteLoop, Name, Options, StartTime, Status (running, pause, stop), StepNumber, Tag.
- **History log (since v2.01)** as it appears at the bottom of the Crystal screen.

No other information is sent to the cloud. no record files, no recipes or scripts, no batch content.

All data are visible on the web site (cloud menu) or in the mobile or client application into the Grid view.

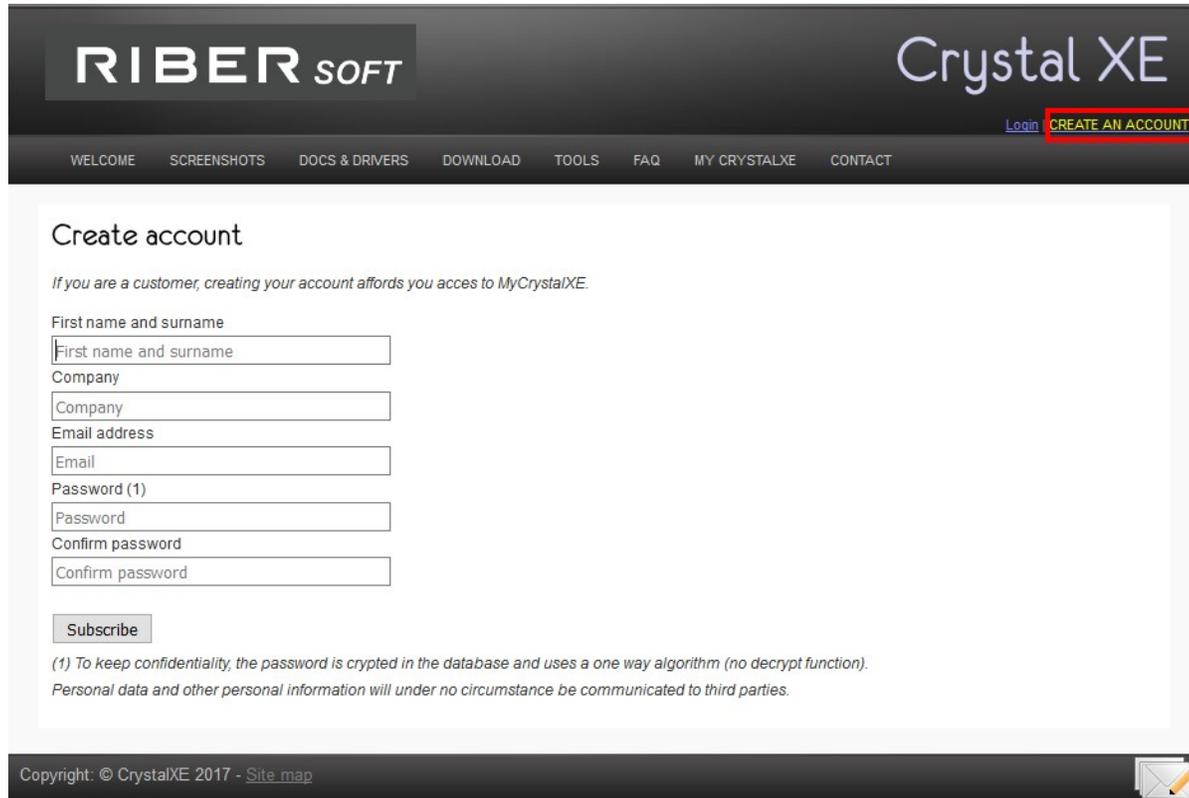
Then data are disconnected from the application.

3.3 Downloaded data

The connection between the server and the mobile application or the Windows client application uses the same level of protection that the data sent to the server.

4 Create your account on line

If you don't have already created your account on the CrystalXE website, go at <http://www.crystalxe.com> , click on **Create an account**, fill in the form and submit your request.



The screenshot shows the 'Create account' page on the CrystalXE website. The header features the 'RIBER SOFT' logo on the left and 'Crystal XE' on the right, with a 'Login' link and a highlighted 'CREATE AN ACCOUNT' button. A navigation menu includes 'WELCOME', 'SCREENSHOTS', 'DOCS & DRIVERS', 'DOWNLOAD', 'TOOLS', 'FAQ', 'MY CRYSTALXE', and 'CONTACT'. The main content area is titled 'Create account' and includes the following elements:

- A note: *If you are a customer, creating your account affords you acces to MyCrystalXE.*
- Form fields: 'First name and surname', 'Company', 'Email address', 'Password (1)', and 'Confirm password'.
- A 'Subscribe' button.
- Footnote: *(1) To keep confidentiality, the password is crypted in the database and uses a one way algorithm (no decrypt function). Personal data and other personal information will under no circumstance be communicated to third parties.*

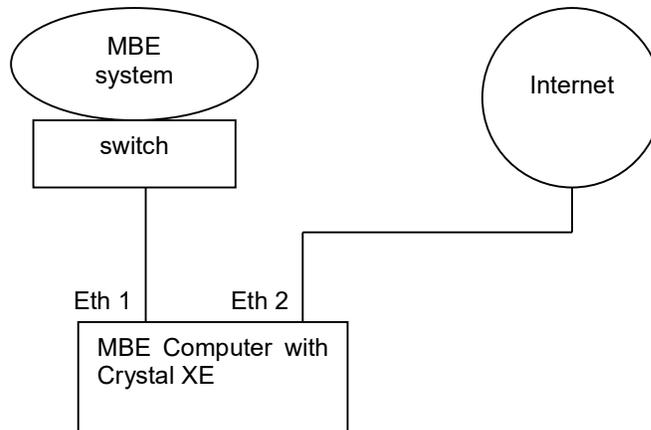
The footer contains the text 'Copyright: © CrystalXE 2017 - [Site map](#)' and an email icon.

After a time you will receive an email notifying you that the account has been activated by the moderator. As this is a manual operation it may take quite a bit of time. Then you can configure Crystal XE, see next step.

5 CONNECT THE COMPUTER TO THE INTERNET

If the computer is already connected to the Internet, jump to the next section, otherwise there are three possibilities.

5.1 Connect the computer to the Internet using the second Ethernet port

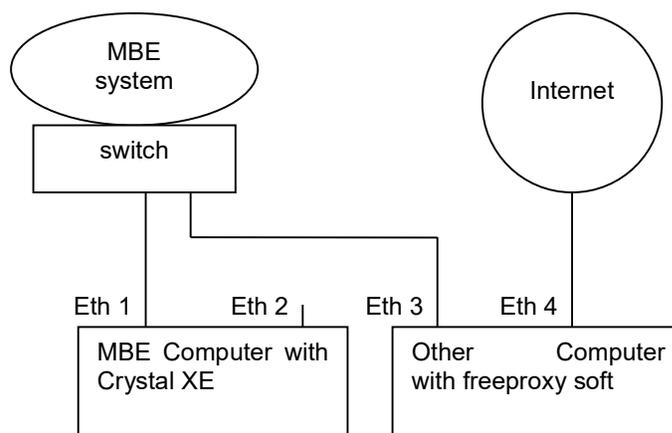


Example of IP addresses:

- Eth 1: 192.168.0.11
- Eth 2: AUTO (DHCP)

In that case, in the options of Crystal XE, you don't need to check the box "Use proxy".

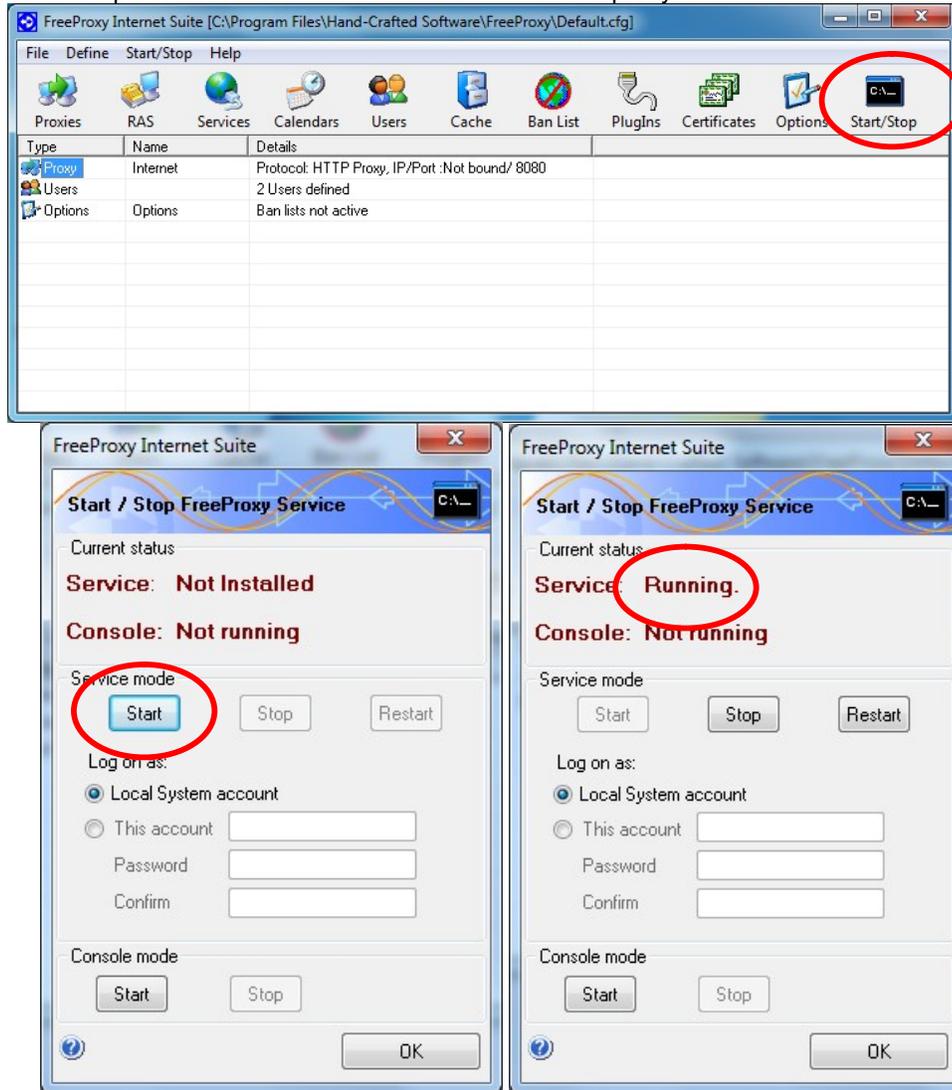
5.2 Use another computer acting as a proxy



Example:

Eth1 : 192.168.0.10
 Eth3: 192.168.0.11
 Eth4 : AUTO (DHCP)

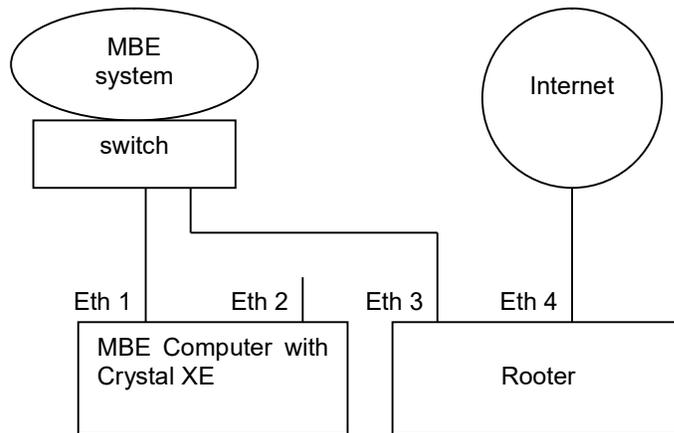
- In Crystal XE, check the box “Use proxy” (see next section) and define the server with the same IP address of the Ethernet Eth 3 port (192.168.0.11) with the port 8080.
- Download the freeproxy software on the CrystalXE.com web site (menu tools)
- Install the freeproxy software into the other computer.
- Run freeproxy software.
- Click on the Start/Stop button and then the start button to start the proxy.



- Check if the service is running (see the screen copy above).
- In Crystal XE, return to the Options/Cloud and enable the cloud.

5.3 Use a router

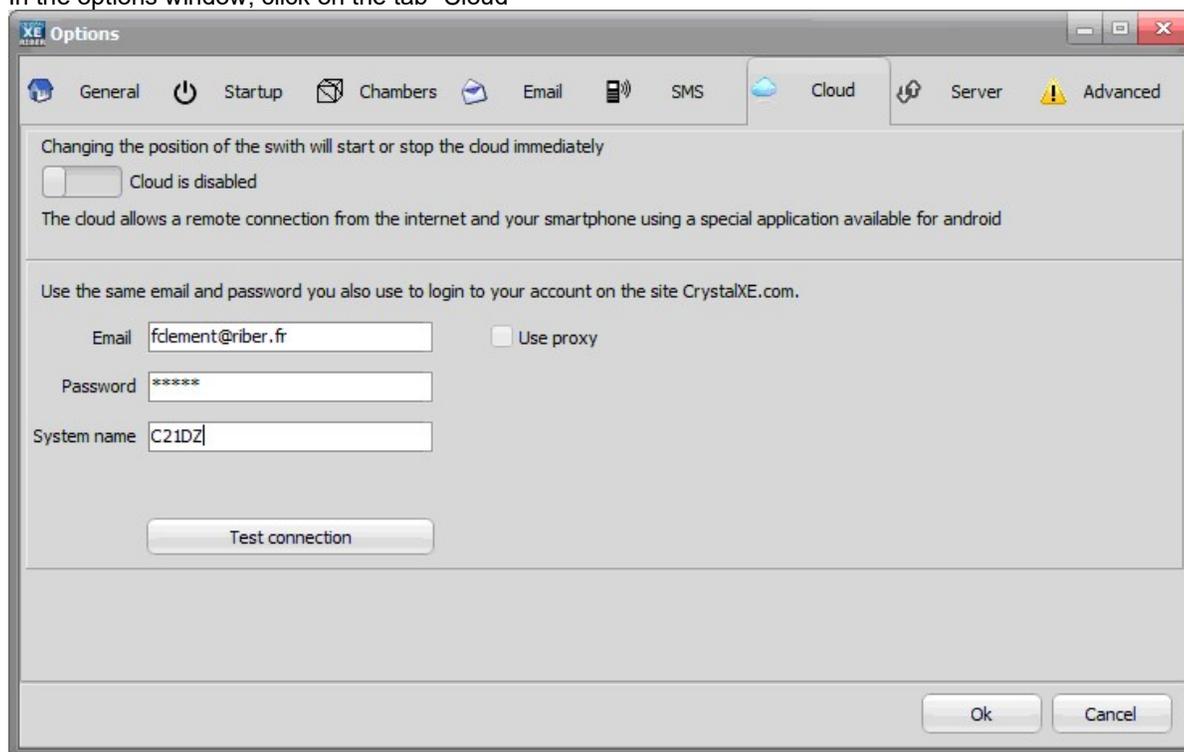
If you don't want to connect the computer where the Crystal XE software is installed to the Internet, you can also use a router between the CrystalXE computer and the Internet or LAN.



6 Configuration of Crystal XE

If it is not already running, execute Crystal XE, go in the menu Setup / Options or click on the parameters button located on the top and right and click on Options.

In the options window, click on the tab “Cloud”

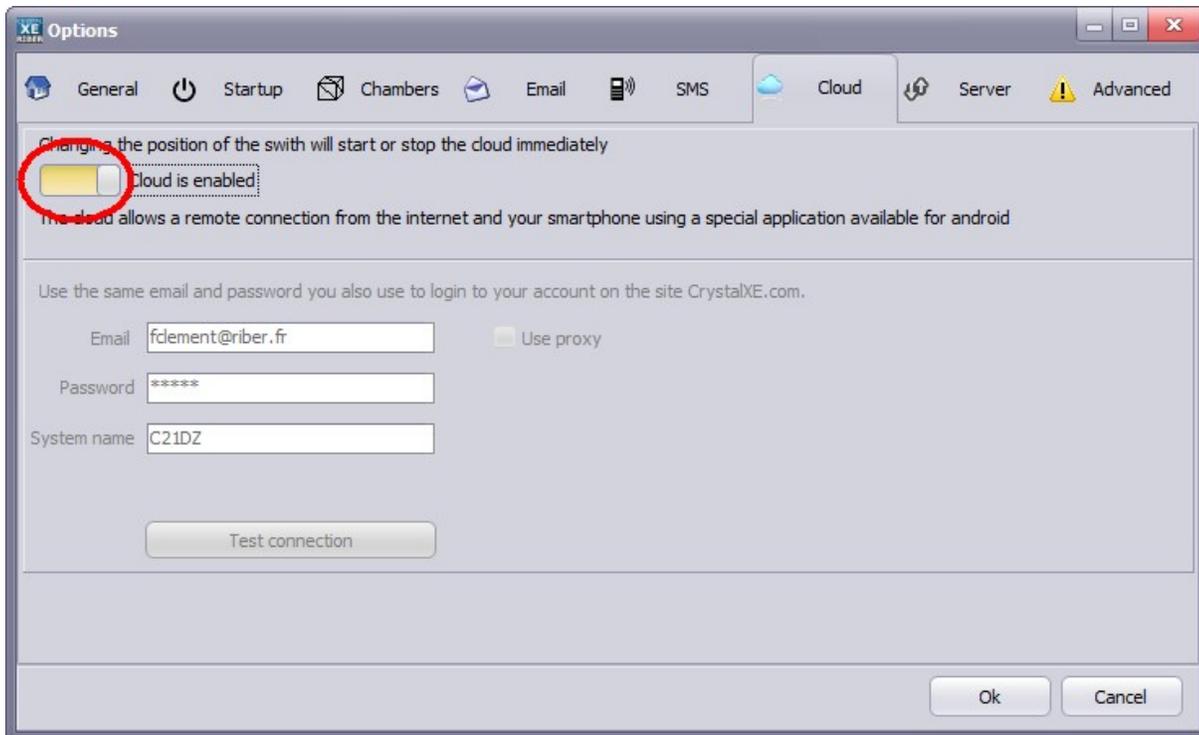


Fill in the fields with the email and password that you use to access to your account on CrystalXE web site, give a name to your system (without space and special characters)

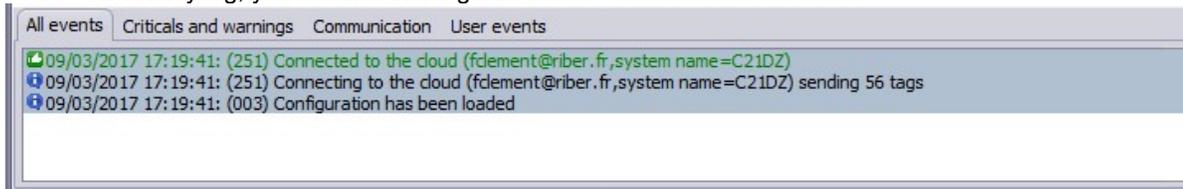
If you are using a proxy, check the box “Use proxy”, enter the server IP address and the port (default 8080). If the proxy needs identification, enter the Username and the password of the proxy.

Then click on the button “Test connection”.

If the test is ok, click on the switch button to enable the cloud and push on the button OK to close the options window.



Check the history log, you should read a green event "Connected to the cloud"



If you want, you can follow the activity of the cloud engine by opening the cloud inspector from the menu **View / Cloud inspector**.

7 Cloud on the web

Once your Crystal XE software is connected to the cloud, from another computer, go at <http://www.crystalxe.com>, login with the same email and password you've used in Crystal XE and go in "MY CRYSTAL XE" and "MY SYSTEMS"

RIBER SOFT Crystal XE

Welcome Franck CLEMENT | [Logout](#)

WELCOME SCREENSHOTS DOCS & DRIVERS TOOLS FAQ **MY CRYSTALXE** CONTACT

PROFILE VERSIONS RESOURCES DOWNLOAD CRYSTAL XE MANUALS **MY SYSTEMS**

My systems

Connected systems

System name	Creation	Last access time	Last access duration	Status
JPVE	2017-03-07 15:22:43	2017-03-09 17:51:11	0 min	✓
test	2017-03-08 09:11:58	2017-03-08 09:12:05	1 days 8 hours 39 min	!
C21DZ	2017-03-08 09:17:17	2017-03-09 17:51:11	0 min	✓
justepourtest	2017-03-09 09:09:08	2017-03-09 09:22:08	8 hours 29 min	!

⚠ Data out of date since more than 5 minutes
 ! Data out of date since more than 1 hour

This page is automatically refreshed every minute.
 Last update date and time (24h format - GMT+1): 2017-03-09 17:51

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"My systems" displays all your Crystal XE computers with which you have already established a connection to the cloud. You can identify the computer by the System name. The icon indicates if the system is connected since less that 5 minutes (green icon) or between 5 minutes and one hour (yellow icon) or more than one hour (red icon)

Click on a system name to access to the data.

Browse system IPVF

id system=2329

open all | close all

- IPVF
 - Growth1
 - P_P1_KPC
 - Cracker_Tip_Z2
 - Reservoir_Evaporator_Z1
 - MV : 34.5601959228516
 - Offset : 0
 - TSP : 0
 - regTSP : 10
 - CSP : 10
 - MaxTSP : 155
 - MaxOP : 12
 - TOP : 0
 - OP : 0
 - TuneMode : 0
 - RampSP : 10
 - RampOP : 0
 - AllAgentDisabled : 0
 - Name : Reservoir_Evaporator_Z1
 - RegConnected : 1
 - SubChannelNbr : 3
 - SubErrStatus : 0
 - SubSecEnabled : 0
 - Tag : 0
 - Shutter
 - Valve_AVP6504
 - AlarmACK : 1
 - EquErrStatus : 1
 - Name : P_P1_KPC

This page is automatically refreshed every minute.

8 Mobile application

8.1 Installation

When this document was written, only the application for Android was available.

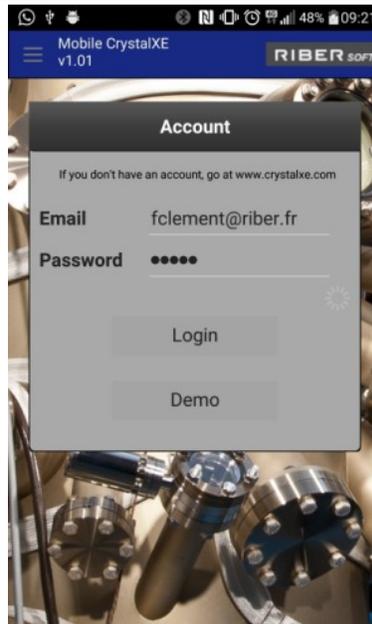
In your android device (mobile or tablet), go in the google play store and type crystalxe, then select the crystalxe application and install it.

To preserve your confidentiality, no permission is required (position, identity, contact and other confidential data is not used)

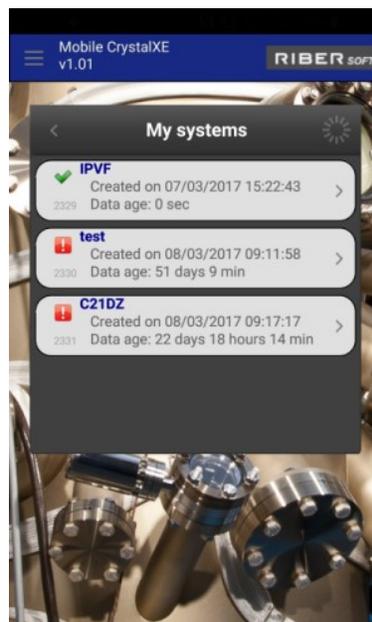
A new icon will be created



8.2 Login



Enter the email and password of your account.
 If you don't have, go in <https://www.crystalxe.com> to create a new account.
 Then tap on the Login button

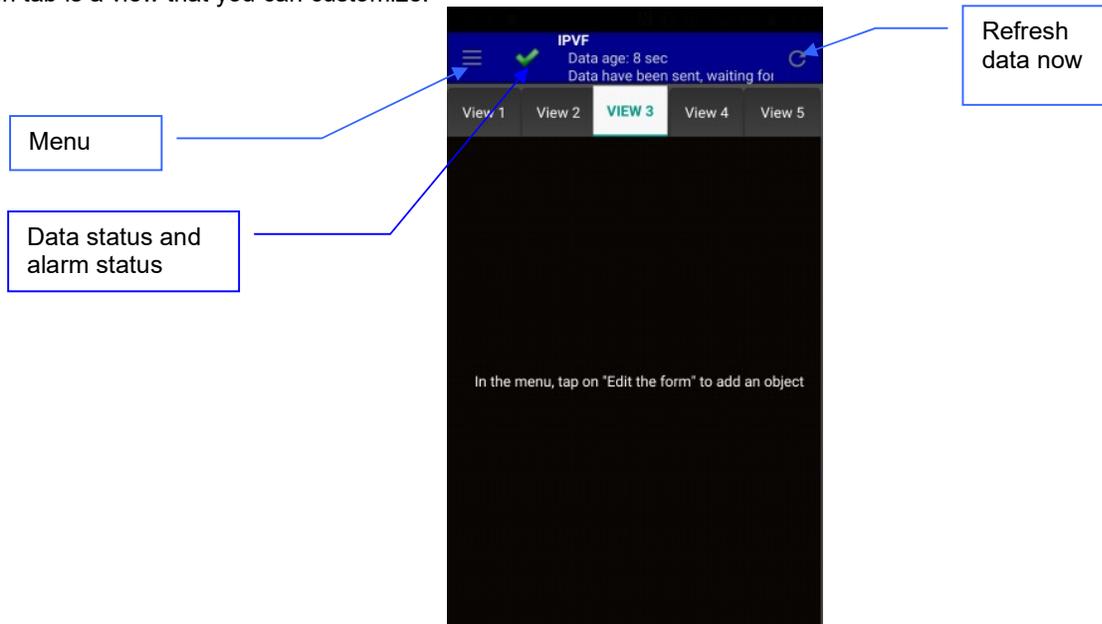


A list of your connected systems is displayed.
 An icon indicates if the system is connected since less than 5 minutes (green icon) or between 5 minutes and one hour (yellow icon) or more than one hour (red icon)

Tap on the system you want to access.

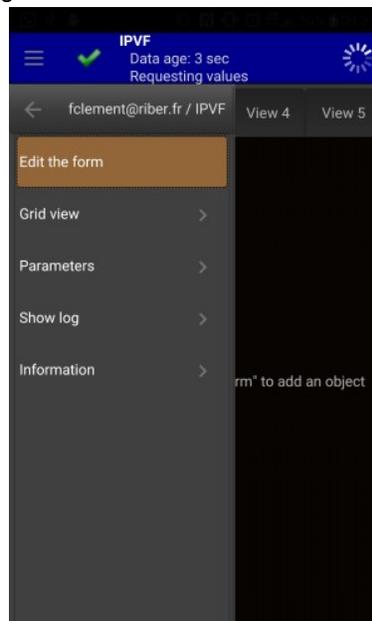
8.3 Overview

Then, you will see a black screen with several tabs and a title bar which indicate the status of the system. Each tab is a view that you can customize.



8.4 Menu

Tap on the menu icon to display menu items



8.4.1 Menu grid view

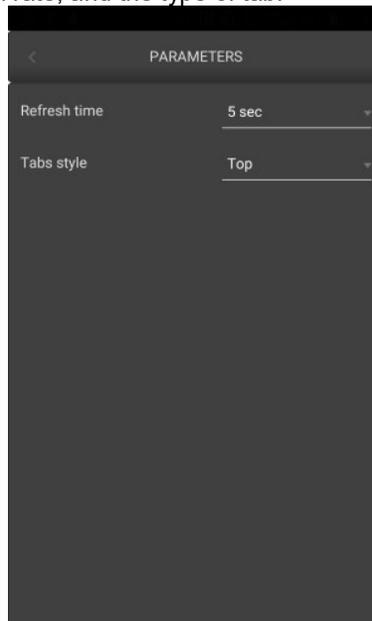
The grid view allows displaying all the data in a grid.

The screenshot shows a 'GRID VIEW' interface with a table of parameters. The table has four columns: Growth1, Growth2, App, and Value. The data is as follows:

Growth1	Growth2	App	Value
Equipment	SubEquipment	Tag	Value
P_P1_KPC	Cracker_Tip...	MV	600.015
		Offset	0
		TSP	600
		regTSP	600
		CSP	600
		MaxTSP	1200
		MaxOP	85
		TOP	42.3895
		OP	43.6445
		TuneMode	0
		RampSP	600
		RampOP	15
		AllAgentDisa...	0
		Name	Cracker
		RegConnected	1
		SubChannel...	2
		SubErrStatus	0
		SubSecEnab...	1
		Tan	0

8.4.2 Menu parameters

Parameters allow you to change the refresh rate, and the type of tab.



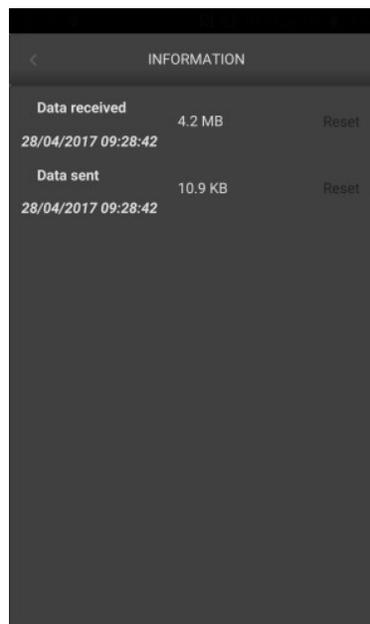
8.4.3 Menu show log

Show Log will display the log of the communication with the cloud.



8.4.4 Menu information

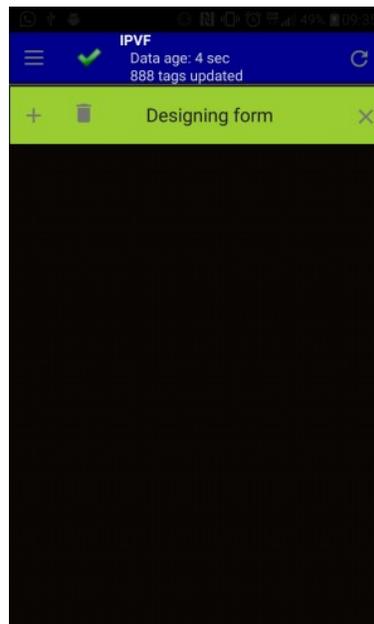
The information page display the quantity of data sent and received from the server since the last reset date.



8.5 Customize the views

8.5.1 Enter in designing mode

In the menu select **“Edit the form”**

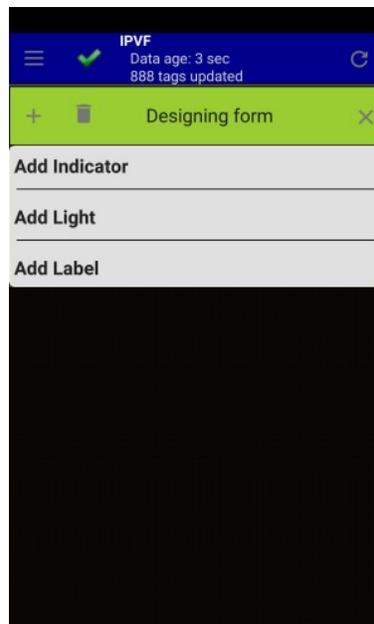


Tap on the cross to exit the designing mode

The green bar indicates that you are in designing mode.

Click on the “+” button to add an object

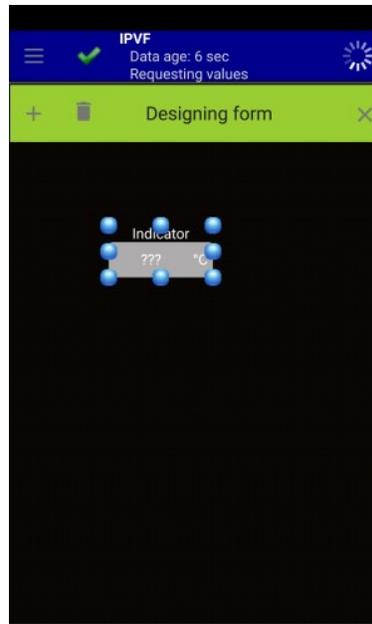
Tap on the “+” button to display the second menu



Three visual objects are provided:

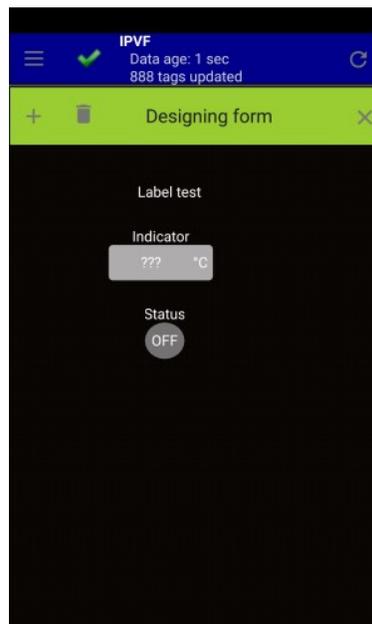
- An indicator
- A light (to represent the status of a binary tag like the status of a shutter)
- A label.

Tap on the items “Add indicator” to insert an indicator into the form.

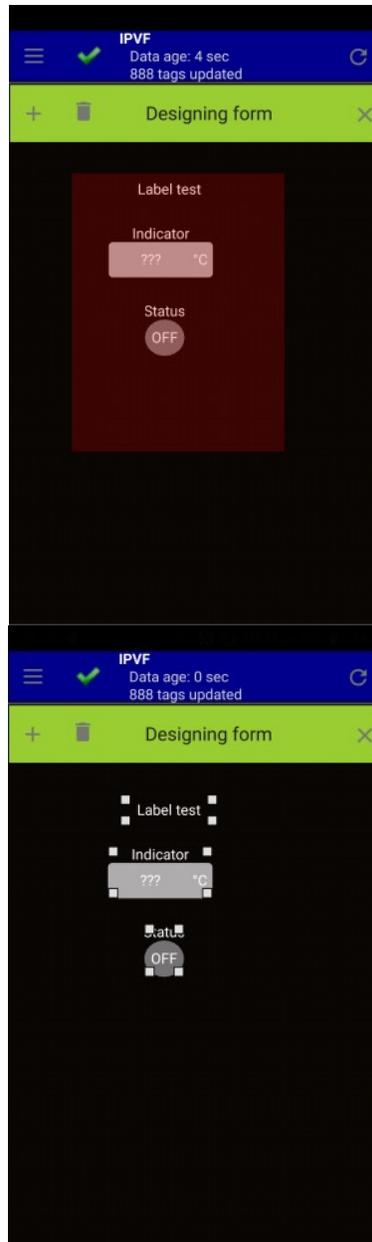


You can change the size of the object by moving the blue balloons.
You can also move the object into the form.

Now add a label and a light.



You can select several objects by drawing a rectangle around of them with your finger.



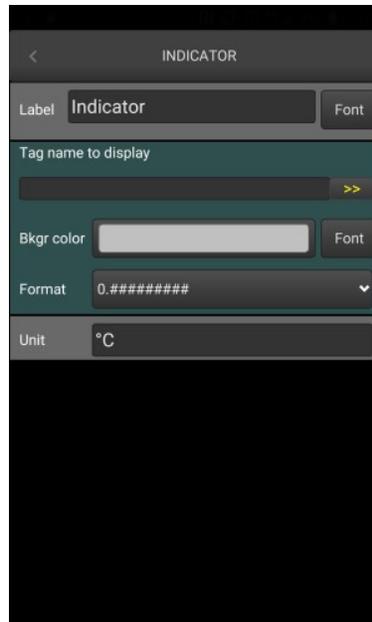
When several objects are selected, you can move all of them with your finger.

Tap outside of the objects to unselect them.

You can edit an object by double tap on it. Then a new screen allows you to change the parameters of the selected object.

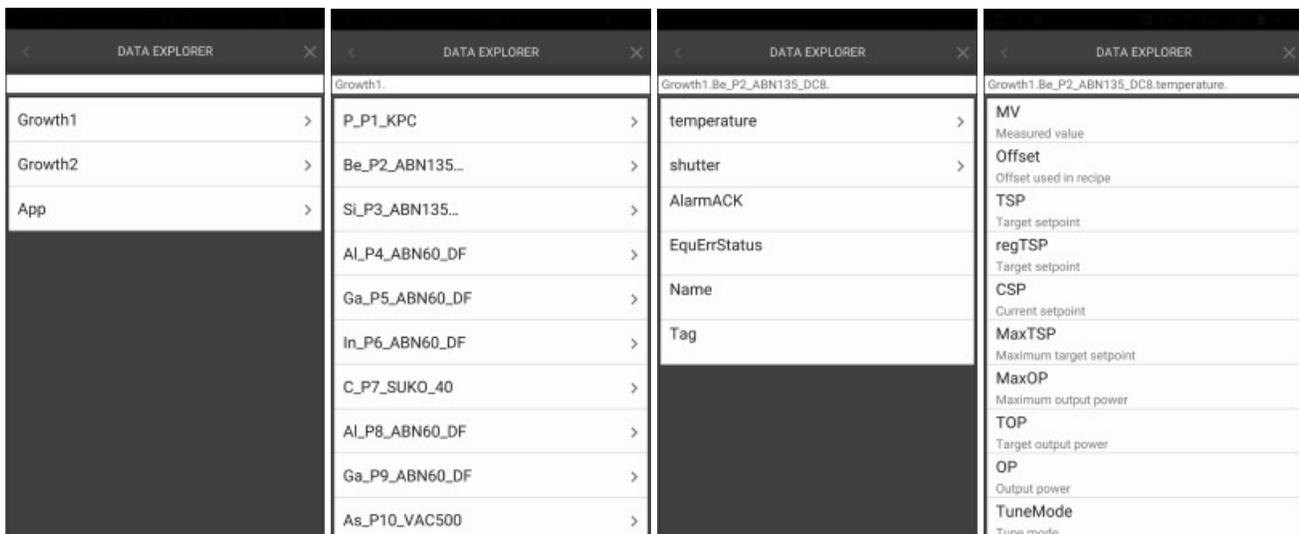
8.5.2 Object Indicator

Double tap on an indicator to display the following screen:



Label is the text which is displayed above the indicator.

Tag name to display: tap on the button located to the right of this field to browse which tag you want to display.





You can change the background color, the font, the display format and the unit.

8.5.3 Object Light

Double tap on the light to access to the parameters.



Label is the title displayed on the top of the object.

You can change the font and the color of the label.

You can change the text which is automatically displayed regarding the status of the tab (see just after)

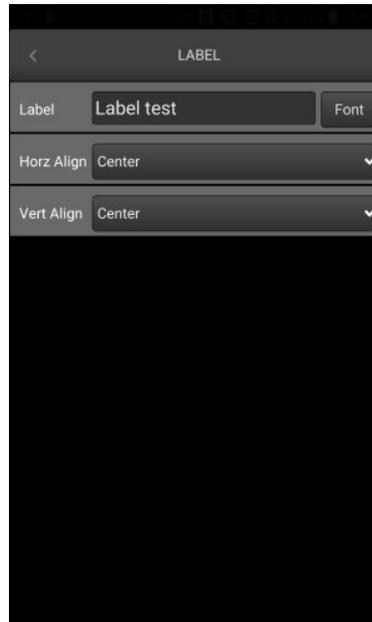
You can change the color of the object when the status is ON and OFF.

Check the box "reverse" to invert the behavior of the light.

Tab name: Click on the button located to the right of this field to browse and select the tab name (see the Indicator object for more details)

8.5.4 Object Label

Double tap on a label to display the following screen:



You can change the text of the label, the font, the horizontal position and the vertical position.

8.5.5 Exit the designing editor

Always exit the designing editor for the modification to be saved on the cloud. To exit, you can tap on the cross in the green title bar or press on the return key of your device. You must have an active data connection for the screen to be sent to the cloud.

All change will be visible on all devices and windows client application. If the other devices are already connected, you'll need to go back to the list of system and tap again on the system name for the change to be taken in consideration.

8.5.6 Example of view

The screenshot shows the 'Growth 1' view of the RIBER mobile application. At the top, there is a status bar with a green checkmark icon, the text 'IPVF', and 'Data age: 5 sec' followed by a refresh icon. Below this is a navigation bar with 'VIEW 1' selected and 'View 2', 'View 3', 'View 4', and 'View 5' as options. The main content area displays a grid of sensor data and status indicators. Each sensor name is followed by its current value and unit, and a status indicator (either 'Closed' in a red circle or a numerical value in a colored box). The sensors include P Cracker, P Reservoir, Shutter, Recipe Layer, Be, Buffer gauge, Si, Load, Al4 Tip, Al4 Base, BakeOut, Ga5 Tip, Ga5 Base, Growth pressure, In Tip, In Base, C, Cryo, Al8 Tip, Al8 Base, Ga9 Tip, Ga9 Base, As Cracker, As Reservoir, Manipulateur, and As power.

Sensor Name	Value	Unit	Status
P Cracker	600.1	°C	Closed
P Reservoir	24.8	°C	Closed
Shutter			Closed
Recipe Layer	4		
Be	600.1	°C	Closed
Buffer gauge	2E-10	Torr	
Si	599.9	°C	Closed
Load	4E-9	Torr	
Al4 Tip	699.9	°C	Closed
Al4 Base	600.0	°C	Closed
BakeOut	45.5	°C	
Ga5 Tip	700.0	°C	Closed
Ga5 Base	600.0	°C	Closed
Growth pressure	8.73E-9	Torr	
In Tip	700.1	°C	Closed
In Base	599.9	°C	Closed
C	61.1	°C	Closed
Cryo	13.20	*K	
Al8 Tip	700.0	°C	Closed
Al8 Base	600.1	°C	Closed
Ga9 Tip	700.0	°C	Closed
Ga9 Base	599.9	°C	Closed
phosphore gaug	1.2E-8	Torr	
As Cracker	600.0	°C	Closed
As Reservoir	53.4	°C	Closed
Manipulateur	529.93	°C	
As power	47.60	%	

8.6 ALARMS / SECURITY

The icon located in the top bar indicates the status of the system.



Everything is ok, no alarm, data are up to date.



An alarm is present. Either data are not up to date (between 5 minutes and 1 hour) or a security is activated on the system. Tap on the Icon to display more details.
Example of alarm displayed:



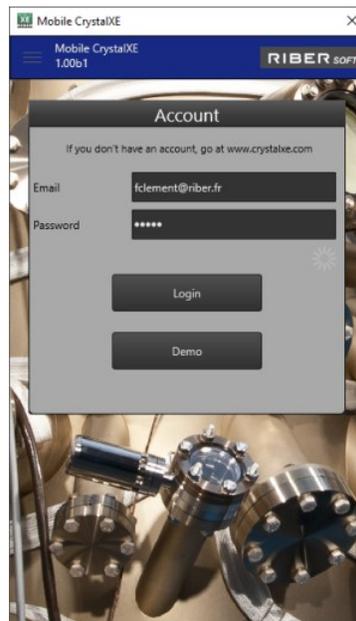
Data are not up to date (more than 1 hour)

9 Windows client application

9.1 Downloading and installation

Download the application from the CrystalXE.com website in the menu **MY CRYSTALXE** and **DOWNLOAD CRYSTAL XE** page or follow this link <https://www.crystalxe.com/download>

This application is a portable application, that's mean there is no installation. Just copy the executable file in a new folder and execute it.



This application is exactly the same as the mobile application, so for more details, refer to the mobile section of this documentation.