

# ISPort User Manual

## Part 1

- **Creating the process plan**
- **Adding information**
- **Process execution and monitoring**
- **Post processing and filing of data**

ISDOK:

**DPM1\_EN\_V20**

## Commonly used expressions in the instructions

### Process instructions

Plan on how to execute the process. Also expressions such as heating instructions or step list may be used to refer to the process instructions. The process instructions determine the progression of the process by setting parameters (temperature, rate of change etc.), testing temperatures, recording time and setting outputs.

### Process

The process instructions underway. If the process execution is saved, the finished process will be called a storage, a heating, a run set or a run.

### Device

An Isx unit located in the telecommunication link. The device comprises multiple I/O-points and temperature controllers, depending on the type and configuration. Same type of points and controllers within the devices are of equal value.

### Point

A general term for all points that participate in the process. Points include test points, inputs and outputs. Controllers can also be called points, even though they are functional units and contain multiple points.

### Field

Data determined with number and type. The field consists of two parts, the heading and the content. The heading is a text that describes the field, and it usually changes when the same field is presented in different languages. The content may be text, numbers, tables, temperatures, clock times etc. Each field has their own ID number, on the basis of which its content can be referred to in the program. The fields, both the fields used by the program and those added by the user, are specified in file IXPortC.txt.

### Project

An entity that consists of the process instructions, points, fields and storages. The entire project data has been packed in the same file, and the project's registration number will be used as its file name.

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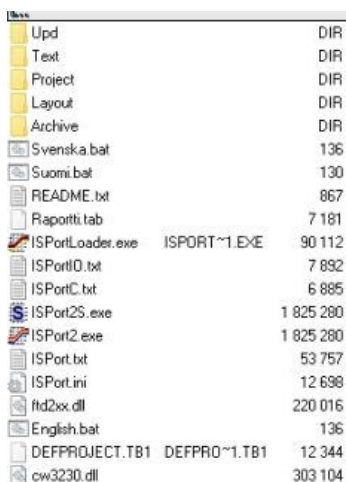
## ISPort program installation

There is no need to install the ISPort program separately - you only need to copy the necessary files in the program's root directory. The user must create the program's root directory either in the PC's hard disk or in a portable media, such as a memory stick. The root directory can be, for instance, C:\ISPort or C:\Programfiles\ISPort or H:\ISPort. The program will not make any notes on the PC's register, nor will it copy files to its other directories.

ISPort program's files:

• ISPortS.exe	ISPort program Setup
• ISPort.exe	ISPort program
• cw3230.dll	Toolkit for ISPort
• ftd2xx.dll	Toolkit for ISPort
• ISPort.txt	Program text defination.
• ISPortIO.txt	Includes words used by the program in the desired language I/O-fields defination.
• ISPortC.txt	Includes words used by the program in the desired language Info Field defination.
• ISPort.ini	Includes words used by the program in the desired language Program defination and settings
• Suomi.bat/English.bat etc.	Language for ISPort. Before starting the program By doubleclicking the language it will be used in ISPort.
• Project (File)	Active Projects (working directory)
• Layout (File)	LAYOUTS for prints
• Archive (File)	Archived projects
• Upd (File)	Program modules for updating devices
• Text (file)	Program text definations
• ISPort.Log	ISPort monitoring log
• Raportti.tab	Contains made reports
• DEFAULT.TB1	Contains devices saved I/O-configurations, settings and calibrations
• DEFPROJECT.TB1	Contains made templates
• Devices.TD1	Contains added devices in device list
• ISPortLoader.exe	Extract the ISPortUpd file with this program

Settings are read from .INI-file, which is placed in the same directory where the program was started. If different paths for directories are set in the INI-file, and they exist, they are not created again in the main directory.



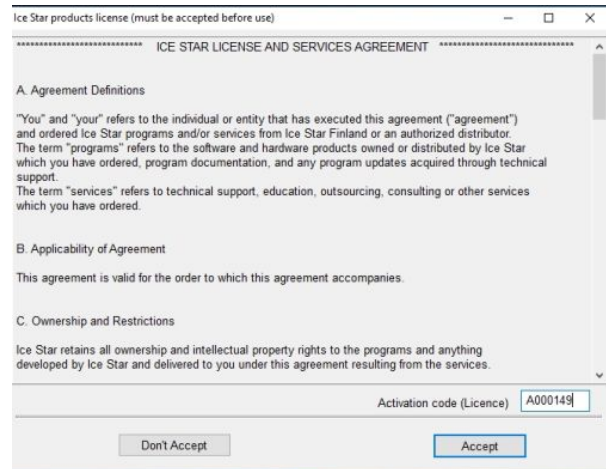
Name	Type	Size
Upd	DIR	
Text	DIR	
Project	DIR	
Layout	DIR	
Archive	DIR	
Svenska.bat	File	136
Suomi.bat	File	130
README.txt	File	867
Raportti.tab	File	7 181
ISPortLoader.exe	ISPORT~1.EXE	90 112
ISPortIO.txt	File	7 892
ISPortC.txt	File	6 885
ISPort2S.exe	File	1 825 280
ISPort2.exe	File	1 825 280
ISPort.txt	File	53 757
ISPort.ini	File	12 698
ftd2xx.dll	File	220 016
English.bat	File	136
DEFPROJECT.TB1	DEFPRO~1.TB1	12 344
cw3230.dll	File	303 104

**After unpacking the zip file, or copying the directory, its practical to make a shortcut to ISPort.exe on desktop.**

## Logging into ISPort

The program is started either by double-clicking the "ISPort.exe" file or the shortcut.

First time starting ISPort, the program asks acceptance for Using Rights. In Using Rights bottom, there must be set "Activation code (Licence)", it can be found from README.txt file.



Next opens ISPort Login window (Picture below)



User ID and password are optional features that are enabled later on from the program's PC settings. If neither of them has been enabled, the "Sign in" dialogue will disappear by itself after a short while. If the dialogue is waiting for the user ID or password and it is closed from the [X] or "Cancel" button, the program will not start up.

If the password is in use and the given password is incorrect, a separate notification thereof will not be given, but the dialogue will remain open until the correct password has been entered. The program starts up from the "OK" button.

### [1] Information about the program's version, root directory's path and downloaded glossaries

### [2] User ID

Text entered to this field will be used as additional information when the program later saves events, settings and acknowledgements. This will not affect the program's operations or the user's rights. If the feature has been set in use, at least one character must be entered in the field.

### [3] Program's password

The password defined in the PC Settings must be entered in the field precisely as it is. The password also determines the user's rights to make changes and settings in the program. The password is in no way connected to the user ID, as everyone uses the same passwords.

Password field is in use when setting is chosen in ISPort's PC-settings.

### [4] Moving to the program or exit

***This dialogue will open only upon the program's start-up, and the information provided in it cannot be modified later on. For instance when the user changes, the program must be closed and restarted.***

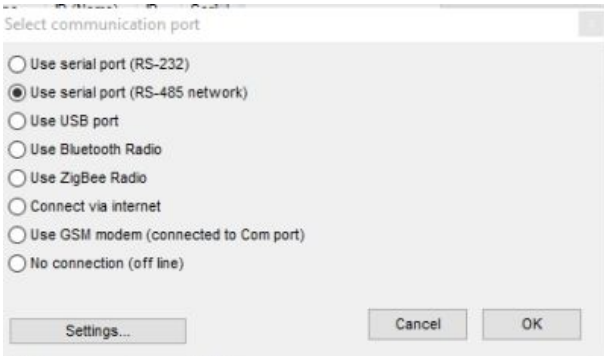
## Program's data communications ports



After signing in, the program automatically opens the "Ports" dialogue. In this dialogue the ports to be used are determined before opening them by clicking "settings...". These settings can be modified later on via the "Ports" button in the button bar.

Only one connection method may be in use at a time.

"OK" enables the new selections. "Cancel" leaves the settings as they are and also opens the selected ports.



### [1] Serial port

If the PC has a serial port or the connection is permanent, it is advisable to use this connection method. The serial port recovers more easily from possible failures than for example USB. Recommended range is max 10 m. This connection method is also selected when using virtual serial ports in connection with USB, MODEM or BLUETOOTH converters. Then range can be even many kilometers. The number of the used port must always be specified when using serial ports. The number of the port can be looked up from the PC's device manager.

#### Making connection with ISPort

- Connect unit with PC and check the number of COM-port from PC's device control (serial port)
- Start ISPort and choose communication port: RS-232 serial port. Click Settings ( Opens communication ports settings(Picture above)) and set the COM port number (serial port)
- Add the device to the device list if its not already there (by clicking right button with mouse)
- Connection OK

### [2] RS-485

RS-485 is a fieldbus, designed for factory conditions. This connection method is not as sensitive to external shocks than for example USB or RS-232. The bus consists of two data conductors A and B and one GND conductor. The PC connects directly to the device's RS-485 bus by using a separate USB-RS-485 transformer. The connection is network, so the device's that you want to connect has to be chosen from the device list.

#### Making connection with ISPort

- Connect unit with PC and check the number of COM-port from PC's device control (serial port)
- Start ISPort and choose communication port: RS-485 serial port. Click Settings ( Opens communication ports settings) and set the COM port number (RS-485)
- Add the device to the device list if its not already there (by clicking right button with mouse)
- Connection OK

### [3] USB

Usb is the easiest way to connect to devices and a good option when there are no available serial ports or the connection is only temporary. USB is sensitive for external failures and it takes time for recover from those, sometimes its necessary to reconnect the USB cable. Recommended cable length is max 5 m. Since the program does not use the PC's port number, the devices may be connected to each usb connector of the PC without Windows separately setting drivers for them. On the other hand, only one Isxx device at a time may be connected. Once the cable has been connected, the ISPort program checks the type of the connected device. If an Isxx device was connected, the connection will be established automatically. When using a USB connection for the first time, it is recommended to first connect the device, and open the port in the ISPort program only after Windows has installed the necessary drivers. Necessary drivers can be found for example from [icestar.fi/drivers](http://icestar.fi/drivers).

#### Making connection with ISPort

- Connect device to PC
- Start ISPort and choose communication port: USB port
- Device comes automatically to device list
- Connection OK

#### [4] Bluetooth

With bluetooth the range is max 30 m and its very sensitive for failures. Bluetooth is not a recommended connection method while updating devices. With bluetooth can we connect one device at the time. First add the device to PC's bluetooth list. For each connected device is a own COM-number, which is used when the device is connected. Add the number to the device Bluetooth settings dialog.

##### **Making connection with ISPort**

- Connect the device to PC with Bluetooth and check outgoing COM port number from PC's bluetooth settings
- Start ISPort and choose communication port: Bluetooth
- Add the device to the device list if it's not already there (by clicking right button with mouse)
- Doubleclick on the device's line (opens communication ports settings)
- Set the COM port number (bluetooth)
- Click the device's connection square and wait until the connection is OK

#### [5] Zigbee

In Finland the ZigBee radio works in 2,4 GHz. Range can be 100-500 m, depends on other radios in the same area. ZigBee is sensitive for failures and it should not be used while updating devices. ZigBee is very easy way to connect the PC and devices.

To the Zigbee modem connects by using a virtual com-port, the ISZB modem can be connected without a com-number. If not connected with a virtual port, is the com number always 0.

##### **Making connection with ISPort**

- Connect the other ZB to PC's USB port and the other ZB ISC's RS-232 connector (in ISQ built-in ZB for optio)
- Start ISPort and choose communication port: ZigBee radio
- Add the device to the device list if it's not already there (by clicking right button with mouse)
- Click on the device's line
- Connection OK

#### [6] GSM-Modem

A GSM-modem which is connected to PC can be used to connect the device, and sending textmessages. Modem is always connected by using com-number.

Create connection by using GSM-modem

If connecting to separate devices' by using plural modems, it's easiest to give the devices phonenumber separately in the GSM-settings dialog.

Choose "Use in device...." and leave the phonenumber field empty. Otherwise the choice is not made and resivers (device) phonenumber is given to the field in format +....

Sending textmessage

Choose "Send alarm...." and open "SMS settings"-dialog.

##### **Making connection with ISPort**

- Connect the other GSM modem to PC's USB port and the other GSM modem controller's RS-232 connector and check COM port number from PC's device control
- Start ISPort and choose communication port: GSM modem. Click Settings (Opens communication ports settings) and set the COM port number (GSM modem)
- Add the device to the device list if it's not already there (by clicking right button with mouse)
- Click on the device's line
- Connection OK

#### [7] Internet/WiFi connection

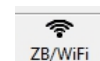
WiFi and internet connection works in network. Connection can be made to all controllers, to where in the factory is installed WiFi option.

To make correct connection, right IP address must be setted to the device and to ISPort

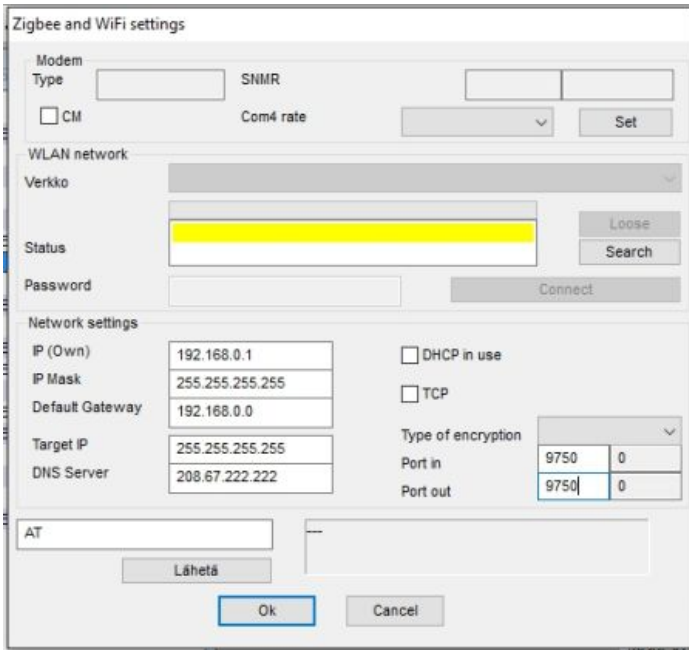
##### **Set the IP address**

First, take internet connection to PC (local network). When established, take USB connection to controller that has WiFi radio installed.

Then choose "Device Info" tab and press button "ZB/WiFi". to open the "ZB and WiFi settings" dialogue.



Continue on the next page >



**To "Port Out" and "Port in" fields, set number 9750 (ISPort programs number) if it does not come automatically.**

First, if the controller searches for network, and does not find, press "Loose" and then by pressing "Search", controller seeks local networks again. Choose same network as chosen to PC and put correct IP settings. If the network is encrypted, choose right type of encryption and password. After this, press "Connect"

**If IP addresses are unknown, choose "DHCP in use". Then the local network gives a temporary IP address, that is also installed to the controller. This works the same way as for example connecting with your phone to a WiFi network. This setting is only intended for temporary use.**



When in "Status" field reads "Connected to network", close the dialogue with "Ok". The settings is then saved automatically to controllers flash memory.

By pressing "Cancel", ISPort asks "Do you want to save the settings to controllers flash memory", answer "Yes" or "No". Answering "No", old network settings comes to controller after next reset.

When connection is established and right settings setted, doubleclick on the controllers row in device list. The "Device Settings" dialogue opens, here the IP address is installed to controller, the same IP address as earlier in "ZB and WiFi settings" dialogue.

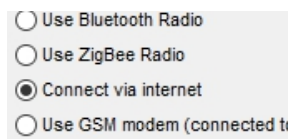
Then, press "Set" and close the dialogue.



Open "Ports" and "Settings", when opens "Communication port settings" dialogue. Set Internet port in "9750" and port out "9750".

Press "OK".

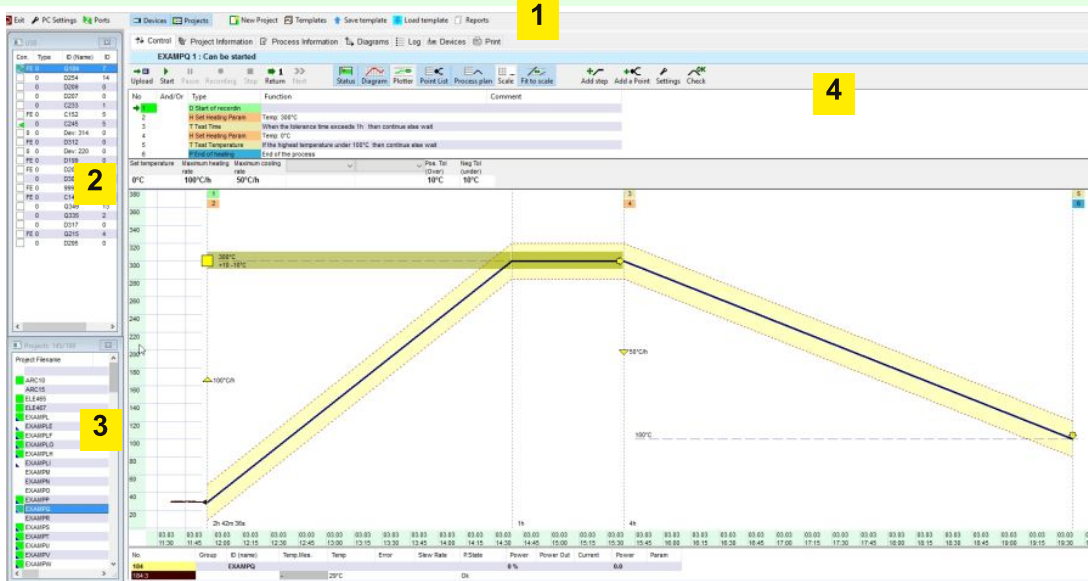
Choose from ports connection type "Internet". If connection is not automatically established, press controllers connection mark.



Devices connected to same RS-485 bus, can connection be established after installing same IP address to their settings,



# Main window in ISPort



The ratio of lists [2,3] and work space window [4] can be changed by dragging the edge of the lists

## [1] Button bar

Fixed button bar located on the program's upper edge. From this bar the visible parts of the main window and other functions related to the program are selected.



- Exit The program is closed. Settings and other data will be saved automatically.
- PC settings Opens the "PC Settings" dialogue
- Ports Opens the dialogue to select the data communications ports.
- Devices Shows or hides the device list [2]
- Projects Shows or hides the project list [3]
- New project Adds a new project to the project list
- Templates Manage templates
- Save template Stores the data and settings of the selected project [4] in the library
- Load template Copies the data and settings from the library to the selected project.
- Reports Opens the "Reports" dialogue.

## [2] Device list

A list of devices used in the system. By clicking on a device you can view or change its settings. A variable number of tabs opens from the selected device's data to the works space [4], depending on the type of device and whether or not there is a connection to the device. Also devices to which you want to establish a connection are selected from the list. Devices are added to the list when they are connected to the PC for the first time. The device will not be added to the list if it is connected to the PC via some other device by using the data transfer's expansion connection. The device may be removed from the list by clicking the "DEL" button.

*The unit must be disconnected before deleting it from the device list.*

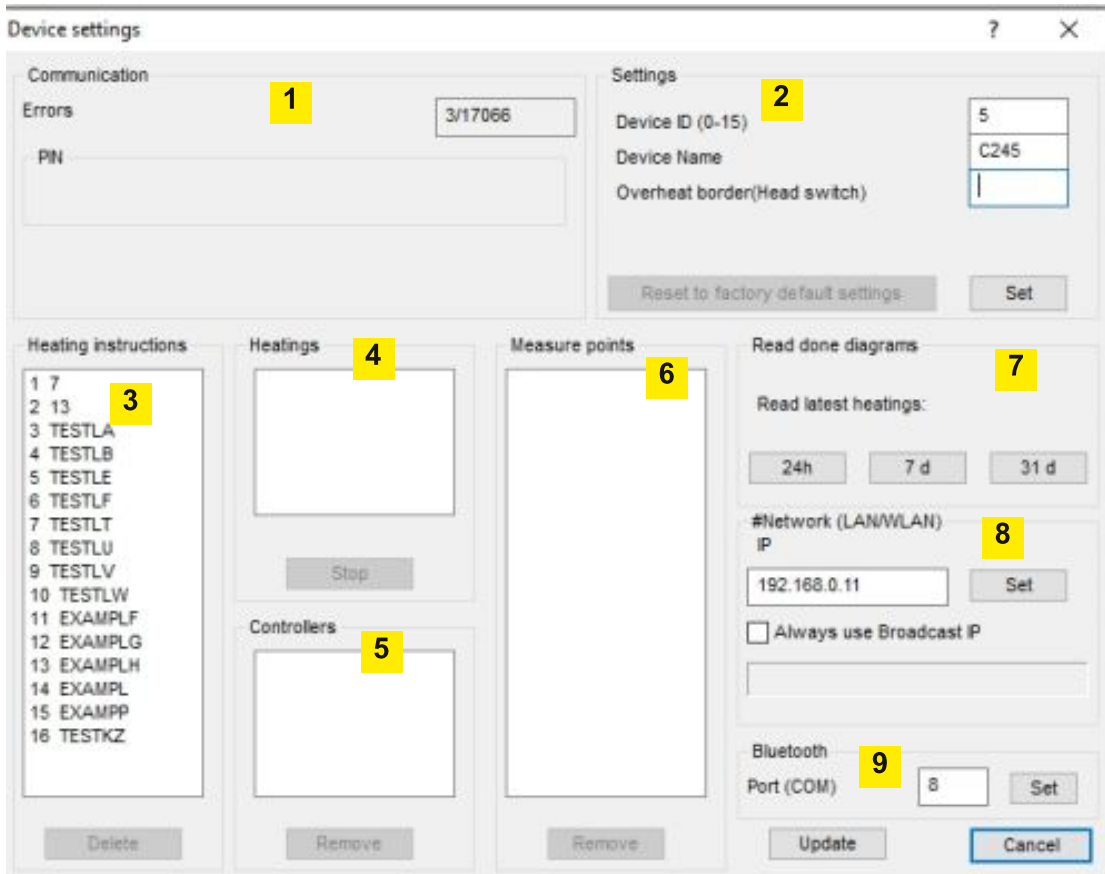
Chose in Device List "IO-Modules" to get access to ISD modules and other extra modules. Otherwise access is only to controllers

☑ IO-Modules				
Con.	Type	ID (Name)	ID	Serial Nr
<input type="checkbox"/>	FE 0	Q184	7	184
<input type="checkbox"/>	0	D207	0	207
<input type="checkbox"/>	0	D209	0	209

The icon at the beginning of the device row expresses the state of the connection. By clicking the icon, the connection may be opened or disconnected.

- No connection is made
- There is data connection to the device
- Device is connected but cannot be used because needed PIN is missing
- Three contact attempts has been made, but no reply from device. The connection will no longer attempt to do
- Connection is made using data link between devices

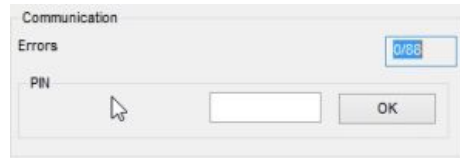
Klick twice with the mouse on the devices row, "Device settings"-dialogue opens.



### [1] Communication

Number of failed data.

If device PIN code is not given correctly when the device is added to the device list, the correct code can be given later in the PIN field.



### [2] Settings

Device ID:

Device's network address 1-15. Devices' which are connected to one RS-485 or with Zigbee modems must have different addresses (ID). If the device's information is not needed in other devices, the ID is set as 0. Controllers (ISC,ISG,ISQ) must always have an ID if they are used in the same process with other controllers. ID can be set to ISD unit if wanted to be seen in connected displays.

Device name:

Helps to recognise device. If name is not given, then use device serienumber.

By clicking "Set" button the ID and name is used.

Resetting device:

- Returns devices fabric settings
- Stops all running heatings.
- Removes all controllers and measurepoints
- Resets device memory and begins storing of information
- Does not reset flash memory, ready processes can be returned.

### [3] Instructions

It's possible to upload up to 24 process instructions to devices' memory. New instruction is loaded to next free memory place, or to defined memory place.

Instruction can be removed from device memory by choosing instruction and pressing "Delete".

### [4] Heatings

Up to 6 processes can be running at the same time in controller. Normally heating is stopped by choosing it from project list and stopping it from "Control" tab. If project is removed from projectlist, or heating is started from other PC, can it be stopped directly from the device. Choose heating and stop it by clicking "Stop"-button.

### [5] Controllers

From the list can be seen which heatings the devices six controllers are connected. Normally controllers are connected and disconnected from the projects "Control" tab.

In special cases controllers can be disconnected by choosing controller and clicking on "Remove" button.

### [6] Measurepoints

Connected measurepoints can be removed from the heating by choosing point from the list and clicking "Remove"-button. Points' numbers are same as device I/O-configuration defined numbers.

### [7] Read done diagrams

Heating instructions are automatically read to the PC if heating and its storing are started with PC or is still running when PC is connected to device. If heatings, and its different storings are started directly from the device, or with a another PC, are they not read automatically from devices memory. These storings can be read from wanted times by choosing similar button. Read projects are added to the project list, and all storings in chosen time period are readed. Other information from device does not transfer from the controller, if needed they have to be transferd with help of project list.

### [8] Network (WLAN/LAN)



If Internet connection port is in use, set here IP address which is used. Same address as in ZB/WF dialogue.

### [9] Bluetooth

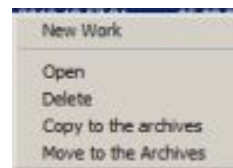
Set the COM port number here for bluetooth connection to ISPort, which COM number, can be found in the PC:s Bluetooth settings, always insert Sending direction number.

### [3] Project list

List of active projects, heatings or tasks. The list consists of projects in the project directory. The project can be opened in the work space by clicking its row. It is recommended to move finished projects to the archive or remove them from the list, because the program monitors the states and progressions of all projects in the list by contacting the devices added to the project. The monitoring uses up the data transfer capacity and slightly slows down the monitoring of ongoing projects. The icon at the beginning of the row indicates the state of the project and connection.

- |                          |  |   |  |
|--------------------------|--|---|--|
| <input type="checkbox"/> | Project has not been started   |  | Process is running.<br>Arrow shows in which phase the process is   |
| <input type="checkbox"/> | Process has been started but it has not yet been finished. There is no connection to the devices, hence it is not known whether it is still going on.  |  | Project has been finished, or at least it has been processed once. |
| <input type="checkbox"/> | Blue bottom corner indicates that there is a connection (online) to all devices associated with the project. The connection is indispensable if one wishes to monitor or control the execution of the process. |   |  |

Functions needed for the project transfer and copying are located in the local menu that opens by clicking the right mouse button on the selected project

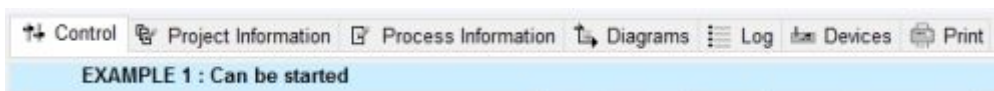


<b>New project</b>	A new project is created and added at the end of the list
<b>Delete</b>	Deletes the selected projects permanently
<b>Copy to archive</b>	Copies selected projects to the archive directory. Still leaves projects in the working directory.
<b>Move to archive</b>	Moves the selected projects to the archive directory. Deletes projects from the working directory.
<b>Read project...</b>	Read the project from another folder, ex. flash memory. The project moves to projectlist
<b>Save project...</b>	Save the project from the list. Project can be read to other folder later.
<b>Show all projects</b>	When chosen all the projects will be shown in list. When not chosen, there is only active projects in list

*Location of the working and archive directory (path) is set in the "PC Settings" dialogue*

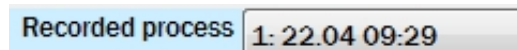
### [4] Work space

By clicking on project on the project list [3], the object opens in the work window or work space that covers the bottom part of the screen. Project in the work space is divided into a number of functional entities by means of tabs. When moving from one tab to another, the possibly entered data in the tab is automatically saved. Below the tab menu there is a notification providing additional information about the state of the project.



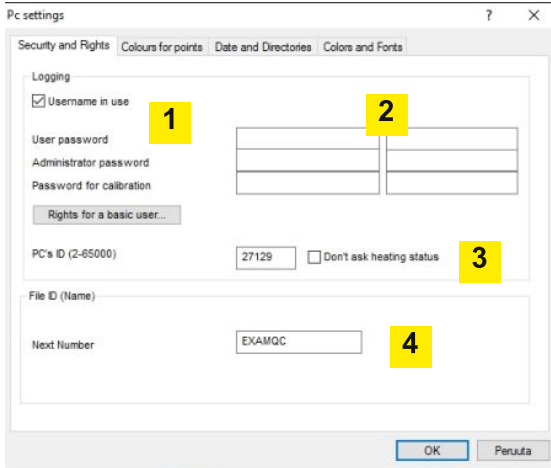
<b>Control</b>	Project's start-up, monitoring and controlling of execution
<b>Project information</b>	Peripheral information related to the project. The information may be selected by the user
<b>Process Info</b>	*Information related to the runs (storages). The information may be selected by the user
<b>Diagrams</b>	*Diagrams related to the runs (curves)
<b>Log</b>	*More detailed examination of information related to the runs
<b>Devices</b>	List of devices connected to the project and their data
<b>Print</b>	*Printings related to the project

*\* If the same project has been run (and also stored) multiple times, the run set handled in the tab is selected from the list, which can be found from the right edge of the display.*



## PC Settings (ISPort Program's settings)

These settings affect the program's operations and layout. The settings are stored in the ISPORT.INI file in the program's root directory. In case the file is missing, the program recreates it with factory settings. Changes made in the settings are stored in the file once it has been closed with the "Ok" button, and also when the entire program is closed.



### Passwords and ID

#### [1] User ID in use

Upon the program's start-up, the user ID must be entered if this selection is in use. The user ID is used when storing events, such as start-ups and stops.

#### [2] Passwords

The password is enabled by typing the same password in adjacent fields. If the fields are empty, the password is not in use and the program will not ask for it upon start-up. The password is the same for all users, i.e. it is not bound to the user name. Main user may change the settings and configurations of the devices, basic user may create and use projects. When the main user's password is missing, all users are main users. Calibration procedure needs own password.

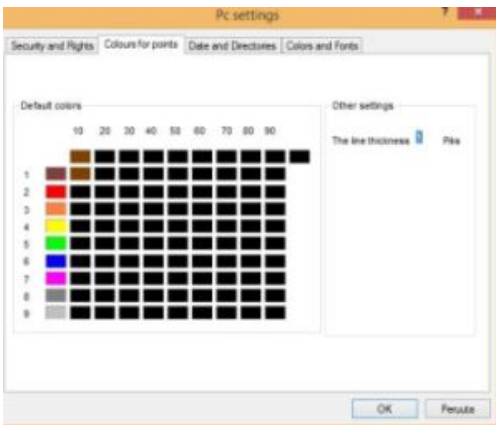
#### [3] PC's ID

Because of data transfer between the devices and the PC, all devices must have the same address i.e. the ID. If the devices have a plurality of PCs connected to them at the same time, it must be ensured that they all have different IDs. The program automatically raffles the ID if the field is left empty.

"Don't ask heating status" can be chosen, when controllers (ISQ/ ISC) are not connected to PC

#### [4] Next number

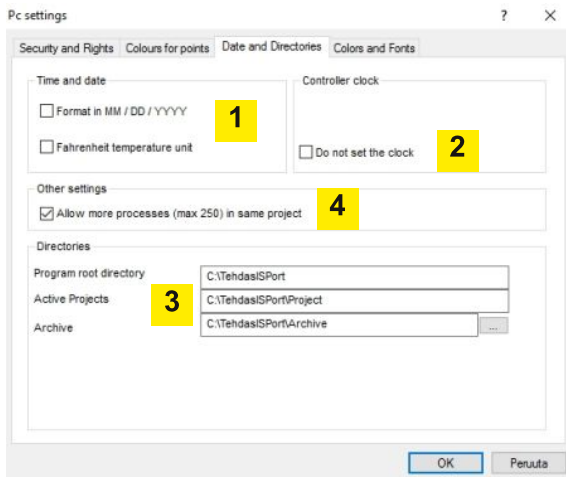
The program automatically suggests a registration number for new projects. The number consists of a fixed part and a variable part following it. The next suggested registration number can be set here.



### Default colors of the points

When connecting points, such as temperature sensors, controllers and switches, each point is given a color that will be used later on in diagrams and tables. If the point has not been specified a fixed color, the table colors will be used in sequence. The greatest number of points in the same project is 99. The thickness of the diagram line can be set between 1 and 9. The point color can be changed later on in a number of locations.

## Program's general settings



### [1] Time and date

Temperatures used in the program can be entered and presented either in Celsius or Fahrenheit degrees. Devices (ISC, ISQ) and the ISPort program use Kelvin degrees, which are subsequently converted into the selected unit. The date can be presented in form dd.mm.yyyy or yyyy/mm/dd. The settings take effect where temperatures or dates are entered or presented.

### [2] Setting the clock times of the devices

The devices (ISC, ISQ, ISG) include a clock circuit, whose time will be set in accordance with the PC's time. The time will always be set if the device clock has stopped, for instance if the device has not been used. Furthermore, the clock can always be set upon opening the connection. Changing the time during the storage may cause problems, and should therefore be avoided. For instance if the device is used on several PCs whose clocks are not in the same time, it is advisable to turn off the automatic setting. It is, however, advisable to synchronize the time with one PC so that the time of the devices is always correct.

### [3] Directories

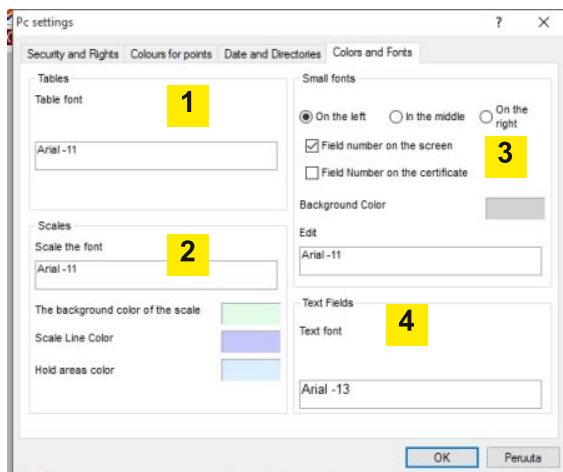
Program's root directory is always the directory from which the program is started. It cannot be changed and it has been presented herein only as an information. Program's root directory includes for instance ISPORT.INI to which these settings have been saved. LAYOUT and UPD directories are the root directory's fixedly determined subdirectories. User may determine the directory in which active and archivable projects are located. Missing directories are created in the program's root directory upon the program's start-up. If the project directory is changed, the program must be closed and restarted in order to allow the project list to update with the content of the new directory. It is recommended to move the projects to the active directory once their processes have been executed. Each active project uses up the PC's resources.

### [4] Allow more processes (max 250) in same project

When chosen, it's possible to run more than one process in same project.

When not chosen, all processes can run only once. Also a few settings are not possible anymore, ex. Process information, Return> button, recording button.

## Font types and colors



Since there are various different displays and operating situations, it is reasonable to adapt the program's texts and colors according to the PC and the operating situation. On this page the font types and their sizes and colors will be set. The text can be modified by clicking its font type sample or the background color's sample box. New settings take effect when the program is restarted.

### [1] Tables

Text type used in tables. Although the text color can be specified, the program will not use that color, as the colors are determined according to the situation.

### [2] Scales

Text types and colors of both axes of the diagram. In printouts own text types may be determined for the scale texts, but their colors are set herein. The color of the scale line is in use in all diagrams, also in printings. Background color of the scale is used only in the diagrams of the "Control" tab. In other diagrams the diagram's base color will be used (white).

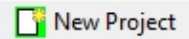
### [3] Small fonts

Small letters are used in the field labels (heading). In fields to which the user enters information, tabs "project data" and "run data", the location of the heading may also be determined. Fields and the data therein have been numbered, either with fixed numbers (System data) or ID numbers given by the user. The ID number can be set visible on the PC's display and in printouts. This facilitates the field's identification especially if multilingual glossaries are used in conjunction with the program. The heading text's background color may also be specified. The background color is only used on the PC's display and only in conjunction with the user's fields.

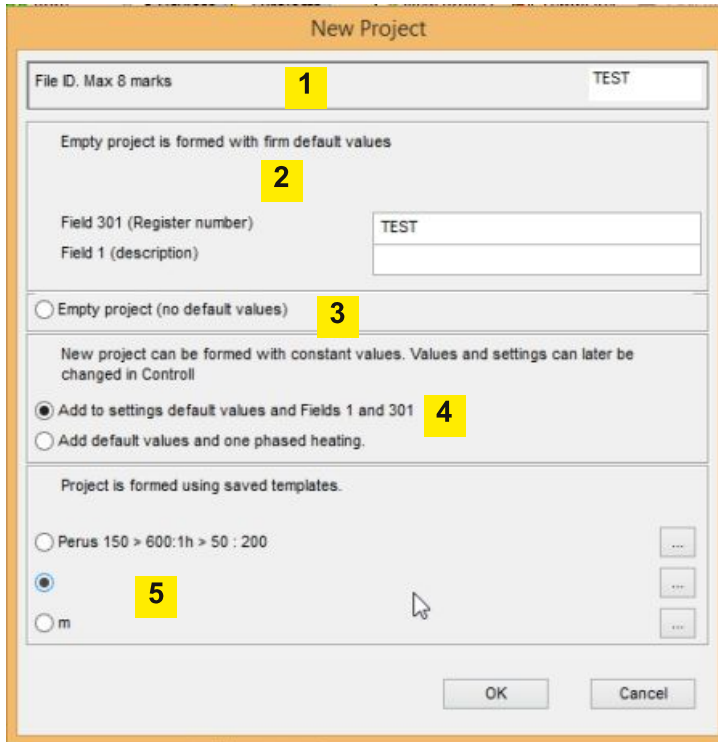
### [4] Text fields

Used in connection with the text part of the fields. In some of the program's own fields the determined color will be used, whereas in the user's fields the field type determines the color.

## Creating a new project



Creating a new project starts by clicking "New Project"-button on button bar or by selecting "New project" from local menu (Mouse right button)



*Upon creation, the project will be given a ID number which will also be used as the project folder's file name and as a search label in the memory of the devices. Acceptable characters are letters from A to Z, numbers from 0 to 9 and underscore '\_'. The program adds the suffix .ET1 to project files located in the working directory. The maximum length of the registration number is eight characters.*

### [1] Register numer

ISPort sjudges to a new projec a registernumber. The registernumber can max be 8 marks, marks can be A-Z and 0-9.

### [2] Form empty project

At this point can the project allready be formed with default values. Register number (field 301) and description (field 1), these fields can be changed in projects "Project Information" tab.

### [3] Empty project

No default values will be added and no heating phase.

### [4] Form with constants values

A new project can be formed with constant values, choose to add default values to settings and Fields 1 and 301, or a one phased heating and default values.

### [5] Form a project with saved template.

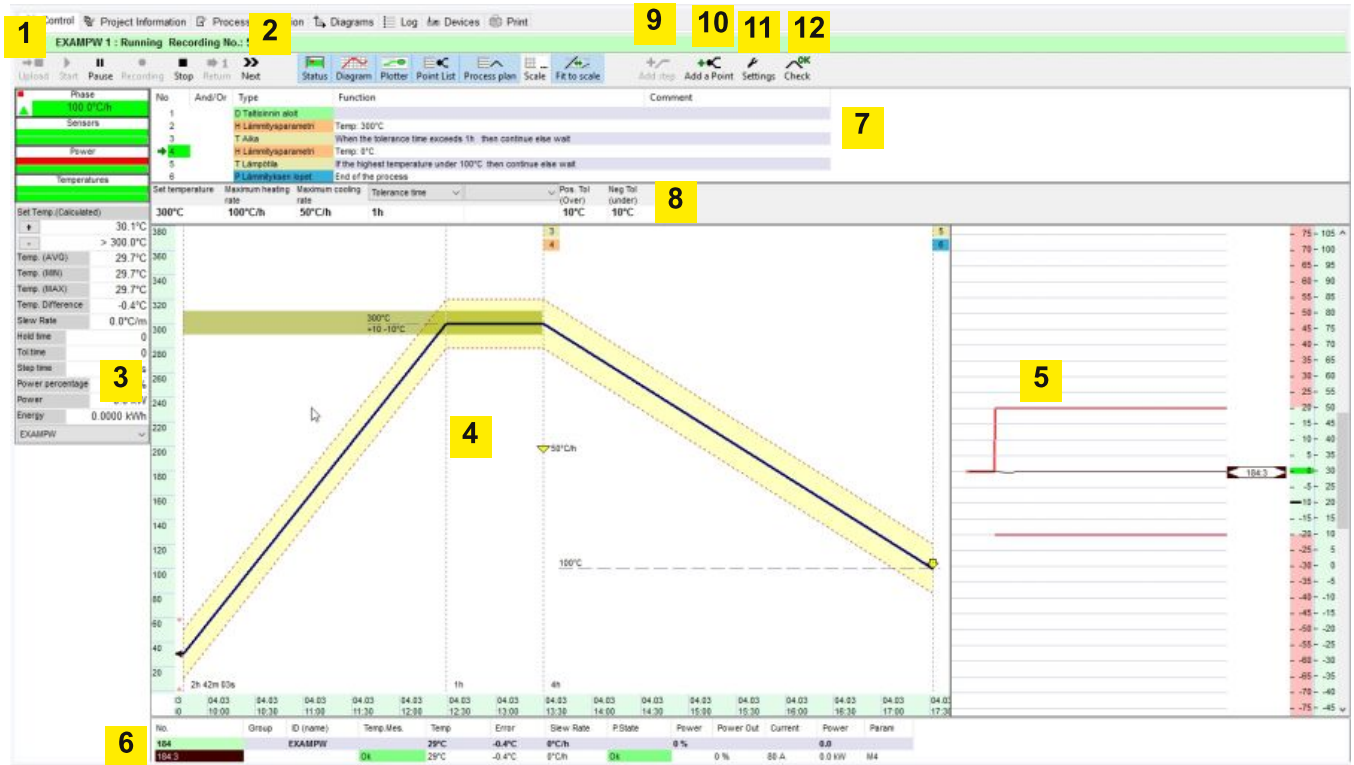
A project can be based at the same time as it is created. Choose template with "...". A template can also later be added with the "Load template" button.

***The same registration number cannot be used for two different projects, as it is guaranteed to lead to confusion.***

# Control

Control Project Information Process Information Diagrams Log Devices Print

Control tab or control page is the most crucial page of the program and, in fact, the only absolutely essential page. With this page you can select the devices to be used and their controllers, points and other possible outputs, determine the values of the heating and control the heating. Other tabs are for the purpose of examining the executed heatings, entering possible peripheral information and making printings. Control page has been divided into a number of independent parts, of which almost all may be hidden or shown.



- [1] Info Project's registration number and information about the project's state
- [2] Button bar Selecting the heating's functions
- [3] Heating status State information about the process and connected points
- [4] Diagram Real-time diagram of process and connected points. (Can be visible/ hidden)
- [5] Error plotter The point's (Controllers and measurement points) deviations from the set value. (Can be visible /hidden)
- [6] Point list Points that are connected to the process and their status. (Can be visible / hidden)
- [7] Step list Step list of the process' instructions. Values can not be altered after start. (can be visible / hidden)
- [8] Set values Set values currently used in the process. Values can be altered also during the heating
- [9] Add step Add a step to the step list. Values can not be altered after start
- [10] Add a point Add a controller or measurement point to the process
- [11] Settings Define process settings, ex. alarm limits and PID parameters
- [12] Check Process' values can be checked before starting and measured values after every step.

## [1] Info

Project's ID number and brief description of the state of the process.



## [2] Button bar



### Upload

Process will be moved to devices memory, but it won't be started. Process can be started later from devices controlpanel (if installed).



### Start

The process may be started when

- The points have been selected. There must be at least one controller in the process.
- There is a connection to devices in which the points are located (online)
- Point or points are not used in other processes

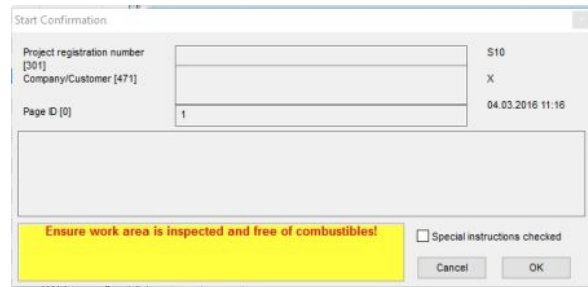
If the process cannot be started, the start button is usually grey. If the process instructions (step list) have been drawn up for the process, they will be started from the step defined in the step list (green). Before start-up, the ISPort automatically moves the process instructions and other necessary data in the memory of the devices, which makes it unnecessary to use the "upload" button.

When pressing "Start", the program will ask if all the settings is OK.

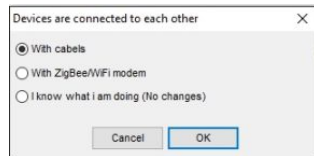
--> Opens "Start confirmation" dialogue

The heating will start, only if "Special instructions checked" is chosen.

Then press "OK"



If there is chosen points from separate controllers to the process, ISPort opens this window (picture below) before starting:



- With cables: ISPort do automatically settings for cable connections between controllers
- With ZigBee modem: ISPort do automatically settings for ZBmodem connections between controllers
- I know what I am doing (no changes): Settings, which are in use, will be used



Pause

### Pause

**Recommended to use "with cables" or "with modem"**

The on-going process may be set in the "Pause" state, in which case its

- execution of the process instructions (step list) will stop
- Change in the rise and drop phase stops, and the controllers will continue to maintain the current temperature
- The hold time increases but the hold phase does not end, since the program stands

"Pause" state can be switched off by pressing the button once more.



Recording

### Recording

Manual start-up of the process's recording. Recording ends when the process is stopped or if the process instructions include a command that can stop the recording. If the same process has been stored earlier, a new storage number will be assigned for the new record number. The largest possible record number for one project is 250.



**Stop**

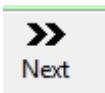
Manual stopping of the process ends the execution of the process instructions and storage and releases all the used points and controllers.

When pressing "Stop", ISPort asks a confirmation for stopping.



**Return**

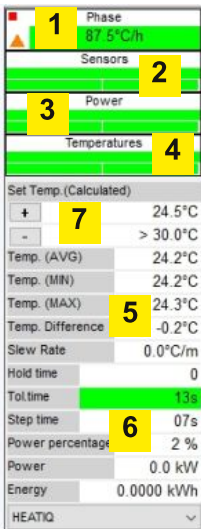
Return-button in use only, when there is allowed more than one process in project from ISPort PC-settings. Return-button is used before starting the heating or alternatively green arrow (first step) will be set manually in the beginning of steplist.



**Next**

Move to next phase, for example from hold to cooling.

**[3] Status of the process**



The state of the process may be easily checked from the color fields on the upper edge of the area. When the process values are ok, the corresponding state fields are green. Yellow or red color indicates an error of sorts or an issue that needs to be monitored. The more specific process values can be checked from the numeric values.

The following example describes a situation where two connected controllers raise the temperature to 300 degrees. Calculated temperature should be 199.8 degrees.

*This display is merely informative, and the process settings cannot be modified via it.*

**[1] Phase**

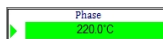
Normally, the current temperature's set value or the temperature's rate of change is in the field on a green base. In rises and drops the arrow is green if the rate of change has not been limited. The arrow is orange if the rate of change is limited upon leaving or arriving at the holding temperature. If the planned rate of change cannot be maintained, the arrow's color changes to blue.



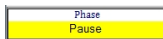
Temperature's set value rises 188 degrees per hour. The current set value (Instructions) can be seen in the field "Set value" of section 5.



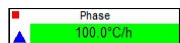
Temperature drops at the rate of 8 degrees per hour.



The temperature's reference value is standard 220 degrees



Process has been set in the "Pause" state in which its temperature's reference value remains unchanged, and the possible heating program will not progress.



Blue triangle indicates limited heating rate



A flashing red square indicates that the capture is on.

## [2] Sensors

The bottom part of the field has been divided into sections according to the number of points, usually the temperature sensors. Each section indicates the state of the corresponding sensor. Green indicates that the sensor is ok, whereas red indicates that the sensor is broken. If all sensors are broken or they are not used to form the process value, the long bar will turn into red, indicating that the process has no more temperature and the execution of that process instructions is yet to be completed.

## [3] Powers

The bottom part of the field has been divided into sections according to the number of points. If the corresponding connected point has a power output in which an error has been detected, the field's part turns into red. The error may be one of the error types set for power monitoring (option). If the process does not have an effective value, the long bar will turn into red.

## [4] Temperatures

If alarm limits have been set for the temperatures and the point's measured temperature does not fall within these limits, the corresponding part of the field turns into red. If the process's temperature is not within the limits, the long bar turns into red.

## [5] Numerical information about the state of the process

Set temp. (Calculated)	The current reference value used by controllers. If the reference value changes (rises or drops), the value following the '>' sign is the finishing temperature in which the change ends.
Temp. (AVG)	The average value of temperatures of all points connected to the process. The points are in the same device.
Temp (MIN)	Lowest temperature of points. All devices.
Temp (MAX)	The highest temperature of points. All devices.
Temp. Difference	The difference between the process's measured temperature and the reference value.
Slew rate	Rate of change of the process's measured temperature.
Hold time	How long the temperature of all involved points has been within the hold tolerance.
Phase time	Time elapsed since the previous setting of reference values (process instructions), otherwise the time since the start of the heating.
Power %	Process's power in percent of the full power.
Power	The combined power of all controllers in kilowatts.
Energy	The power consumed by all controllers in total.

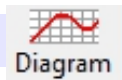
## [6] Device selection

One device's state data is shown at a time. The examined device will be selected from the list.

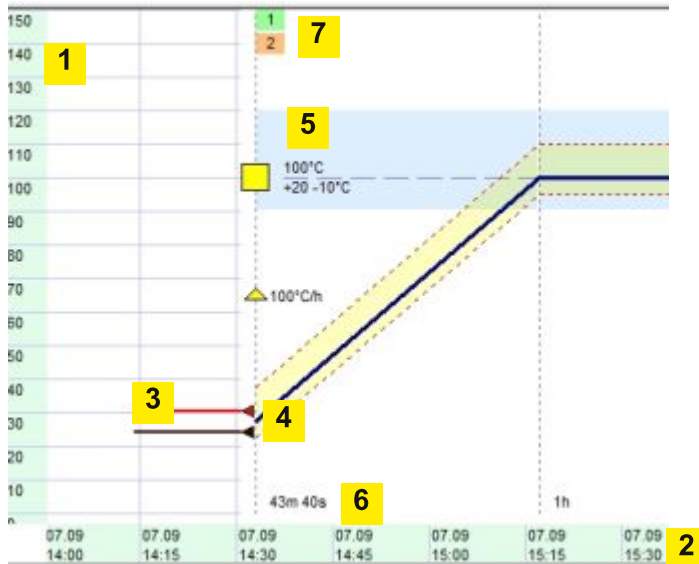
## [7] Fixing error +/-

The error can be fixed with 3 degrees steps up (+) or down (-). Calculated temperature changes immediately.

## [4] Diagram



A graphical representation of temperatures, temperature history and upcoming temperature instructions of the points. The display comes in very handy when checking the process instructions. The temperature and time scales of the diagram illustrating the process instructions can be selected automatically so that the diagram fits the image as a whole. If you want to follow the diagram with a greater resolution and it does not fit the display, the program automatically moves it so that the present moment and the calculated process reference temperature are visible.



**Both scales are selected from the dialogue opened with the "Scale" button or from the local menu that opens with the right mouse button. Both scales can be adapted automatically, in which case the program selects an appropriate scale. When adapting, the heat scale is selected so that the highest measured or set temperature fits the display. The entire planned process is adapted on the time axis, or if the process is continuous, then two hours forward.**



**"Fit to the scale" button sets the fitting of both scales on/off**

### [1] Temperature scale

The scale units (C/F) is set in the "PC Settings" dialogue.

### [2] Time scale

Date can be found in the upper edge of the time scale, and the clock time in the lower edge.

### [3] History

Diagram representing temperatures of the points. ISPort program starts storing the temperatures when it is started and it stores the temperatures from the past two hours. The temperatures are not read from the device's memory.

### [4] Current temperature

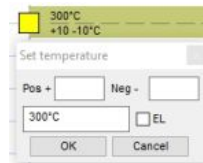
The arrow indicates the point's current temperature. The tip of the triangle points to the present time scale.

### [5] Set temperature

Set temperature (100 degrees in the image), and a hold range marked with green color. In the image, 20 degrees has been set as the positive hold tolerance and 10 degrees as the negative hold tolerance. Thick blue line is the calculated reference value of the process's temperature. On both sides of the reference value the dashed lines represent the limits of the alarm area.

Set temperature can be changed by clicking on yellow square. When opens "" dialogue for altering set temperature and tolerances.

Setted rates can be changed by clicking on yellow arrows. When opens "" dialogue for altering rates.



### [6] Phase time

Time forecast on how long the phase will last. If the process does not follow the calculated forecast, the forecast times change respectively.

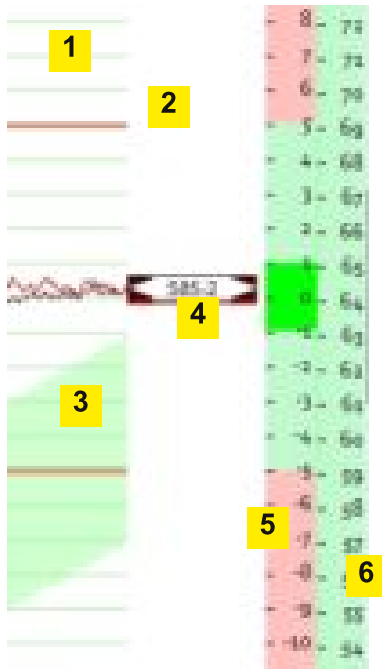
### [7] Step signs

Step numbers of the process instructions

## [5] Error plotter



The plotter shows temperature errors of the points, i.e. how much the point's temperature deviates from the process's calculated reference value.



*The range of the scale can be changed from the dialogue that opens with the "Scale" button, or from the local menu that opens with the right mouse button.*

### [1] History

Storage of the temperature error is initiated when the ISPort program is started, and it will be stored from the past two hours at the most. The values will not be read from the device's memory.

### [2] Alarm limits

### [3] Hold range

### [4] Point's current temperature error

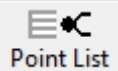
### [5] Error scale

A green area of  $\pm 1$  degrees is marked fixedly in the error scale's zero point. Red areas indicate the current alarm limits.

### [6] Temperature scale

The actual temperature so that the process's calculated reference temperature is at error 0.

## [6] Point list



List of points selected to the process. The point of the diagram and plotter displays is selected from the list, and double-clicking opens the dialogues in which the point settings can be changed. The order of rows can be changed by clicking the column's heading.

1	2	3	4	5	6	7	8	9	10	11	12	13
No.	Group	ID (name)	Temp.Mes.	Temp	Error	Slew Rate	P.State	Power	Power Out	Current	Power	Param
184		EXAMPS		30°C	-0.2°C	0°C/h		0 %			0.0	
184.3			Ok	30°C	-0.3°C	0°C/h	Ok		0 %	78 A	0.0 kW	M4

**[1] No**

Point's number and color. Process's row is marked with a grey color and label "----". By clicking on the points Number/Group the "ID and color for the point"-dialog will open, where you can change the points basic settings.

No.
184
184.3

*At first row, light green background, there is marked Master controller*

The dialog box titled "ID and color for the point" contains the following fields and controls:

- Point ID (Name): A text input field.
- Line: A section containing "The line thickness (Pks)" with a value of 1 and a color selection button labeled "Change color".
- Print settings: A section containing "Group ID (A-X Z=All)" with a text input field.
- Buttons: "OK" and "Cancel" buttons at the bottom.

**[2] Type**

Group ID. Used when Controllers and measurement points are selected to diagrams to be printed on the certificate.

**[3] ID**

Point's ID in this project.

**[4] Temp Mes. State of the temperature sensor. [5] Temp Measured temperature.**

By clicking on this row you will open the "Offset"- dialog, where you can change settings.

Temp.Mes.	Temp
Ok	24°C
Ok	24°C

**Ok (Green) = Measure is Ok and temperature is used in heating controll**  
**Fault (Red) = Temperature missing. Sensor disconnected. Temperature is not in use.**  
**Loose (Yellow)=Temperature is not used in heating controll**

The "Offset" dialog box contains the following controls:

- Two checkboxes: "Temperature is not used in the heating" and "Anturi viialinen".
- Offset (add to measured temperature): A text input field with a value of "+0°C".
- Buttons: "Cancel" and "OK" buttons at the bottom.

Temperatur can be loosed from heating controll. Often used with extra meaturepoints, or if fail in measures.

Positiv Offset is added to temperature, when point is running in lower temperature. Used if wanted temperature different between controllers. Zone +-12C.

**[6] Error**

Error or deviation from the process's calculated reference value. Positive values are overheat.

**[7] Slew Rate**

Temperature's measured rate of change. With points, the rate of change will be calculated from the temperature change during one minute. The process's rate of change is calculated from the change of the process's average temperature during six seconds. Positive value means rise of temperature, negative drop of temperature.

**[8] P.State**

Error detected by power monitoring. If the monitoring is not in use, then OK.

By clicking on this row, "Output power"-dialog opens, there can we directly change the powers settings

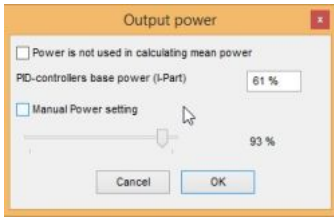
P.State
Ok
Ok

**Ok (Green) = Output is Ok and power is used in heating controll**

**Loose (Yellow)= Power is not used in controll and is not counted in heating's power avarag**

**Manual (Yellow)=Power is defined firmially in wanted value**

Power with or without of heating's power calculating.



PID controller basic power can be set directly by giving power value in fields. PID controller counts output power as follows:  
 $\text{Error} * F = \text{P-part}$ ,  $\text{Error's rate} * F = \text{D-part}$ ,  $\text{Main power} = \text{I-part}$ .  
 When parts are sum will get controllers output power. Standard power changes slowly based on P- and D-parts.

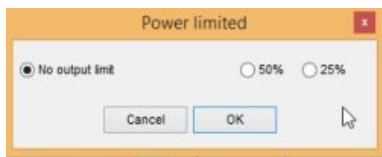
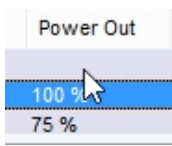
Controller can be used with manual power when it uses firm defined power with slider.

**[9] Power**

Controller's power in percent. Positive values mean heating, negative values cooling.

**[10] Power out**

Heating's power percentage. If the output power has been limited, the number is the limited power at the most. By clicking on this row, "Power limited"-dialog will open where we can define the power.

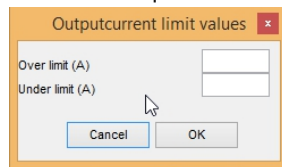
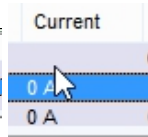


Power limit can be set in three values, 100%, 75% and 25%. Limiting power dose not only define highest used power percent, it also scales controllers calculated power. If less power is needed, adjustment works softer by using scale.

**[11] Current**

Value measured by controller's output flow when the output is on. If the current measuring is not in use, there is no value respectively.

P.State	Power	Power Out	Current
1 %			
Low	30 %	30 %	0 A
Ok	3 %	3 %	0 A

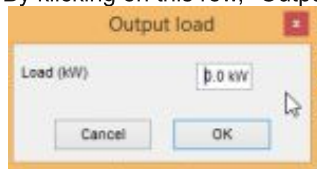


By clicking on "Current" in the point list, opens "Outputcurrentbt limit values" dialog, there can the current upper and under limits be set, as Amper.

If the current goes under/over the limit, will ISPort alarm the user in the Power State row (orange)

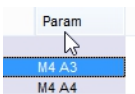
**[12] Power**

Controller's output power in kilowatts. By clicking on this row, "Output load"-dialog opens, where we can change the load as kilowatts. (not yet in use)



**[13] Parameters**

By clicking on this line, "Controlles type and parameters"-dialog opens.



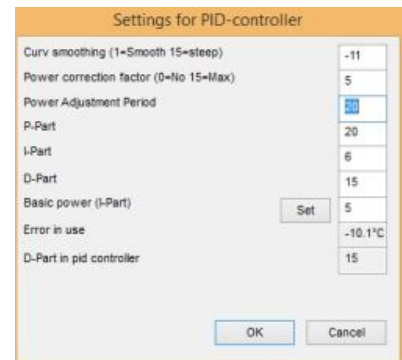
Mx = Chosen parameterserie by user. Setted when heating starts, or setting is changed with slider.  
 Ax = Chosen parameterserie by controller. Controller must be in "Auto PID" function.  
 Curv smoothing to hold temperature is always used with users chosen parameterseris (Mx)

**PID**

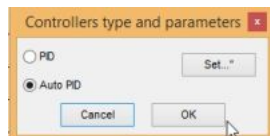
Controller uses defined parametserie in heating "Settings" dialog. Changing settings with slider (1-10) chosen parameters are put to use in all heating's controllers. This setting is used if automatically adjustment can not define right setting.

**Auto PID**

Controller searches fitting parameterseries



If controller is used in PID function can parameters be tested and changed by giving values to them and pressing "OK" button.



## [7] Step list



With the help of the process instructions it is possible to automatically execute multiphase processes. A step list consists of instructions, whose execution is started from the determined step, usually from the beginning, and executed forward one step at a time. Steps may set the process's set values or test the values of I/O points. Set values may be reference values, tolerances, I/O points or even set values of other processes. With the testings, the execution of process instructions is synchronized into temperatures, times, I/O data and other settings. Process instructions are formed by placing steps that execute different functions consecutively in a list. The accuracy of the process instructions can easily be checked from the diagram display.

No	And/Or	Type	Function	Comment
1		D Start of capture		
2		H Set Heating Param	Temp: 300°C Max heating rate: 200°C/h Max cooling rate: 100°C/h Pos.Tol: 5°C Neg.Tol: 5°C	
3		T Test Time	When the holding time exceeds 30m then continue	
4		H Set Heating Param	Temp: 0°C	
5		T Test Temperature	If the highest temperature under 100°C then continue	
6		F End of heating	End of the process	

- [1] No Number of the step. Green base color indicates the next step to be executed
- [2] And/or Several testings may be connected to the same step.
- [3] Type Step's type or function. Different types also have their own label colors.
- [4] Function Description of the step's functions made by the program.
- [5] Comment User's description of the step's functions.

*Using Step list is explained later on "Add step" pages 25-27.*

## [8] Set values

Settings for the process temperature's reference value, limitations for the rate of rise and drop and limits for hold range time. The values can also be changed even though a process program is used (step list).

**The field's value can be changed by typing the new value in the field and pressing the ENTER or TAB button. Quality will not be written in the field.**

Set temperature	Maximum heating rate	Maximum cooling rate	Hold Time	Tolerance Pos (Over)	Tolerance Neg (under)
300°C	200°C/h	100°C/h	30m	5°C	5°C

### [1] Set temperature

Reference value for the process temperature. When the reference value is missing, the powers of connected controllers are in zero. When changing the set value, the new value is immediately set as the reference value of controllers if the rate of change has not been limited. If the rate of change has been limited, the process moves either to the rise phase or the drop phase, depending on the change.

### [2] Largest rate of heating

As the process's set value rises (the new set temperature), the rise of the controllers' reference value is limited to the given value. If the value is missing, i.e. the field is empty, the rate of rise will not be limited, but the process's set value immediately becomes the reference value of controllers. With the set value 0 the reference value of controllers and the temperature will not change. Largest setting 999.

### [3] Largest rate of cooling

Same as above, but the value is used when the temperature is reduced.

### [4] Process instructions either wait for the time or the temperature

Used in connection with the process instructions. The execution of the process instructions waits until the temperature achieves the given limit or until the given time limit has been reached. Only one of them at a time can be set as the condition. The comparison method (list) cannot be changed, whereas the value (temperature or time) can be changed.

### [5] Tolerance Pos (Over)

Forms the holding temperature's upper limit together with the set value. If some involved point exceeds the limit, the temperature is off the hold area, and the hold time will not increase.

### [6] Tolerance Neg (under)

Otherwise the same as above, but the hold temperature's lower limit. The given value is positive (+).

***During the process values can be changed only from setvalues-panel. Steplist can't be changed during process.***



## [9] Add step



Step list is good to be visible before adding steps



*The selected step is clicked on the list and the "Select" button is pressed.*

*The list may be open during the drafting.*

*The selected new step is added in front of the step that is selected (blue) in the step list. If none is selected or if the step list is empty, it is added to the end.*

*Step list's selection (blue) can be put off by clicking the empty space after the last step.*

*Unnecessary steps may be removed with the DEL button.*

*The step's location on the list may be moved by dragging with the mouse.*

### Step types and functions

#### 1 D Start recording

Starts the storage of the process data. Every time the process executes this step, the storage number increases and data storage on a new number is initiated.

#### 2 D Stop recording

Stops recording the data. The capturing is also stopped when the process is stopped.

#### 3 H Heating parameters

Changes the process's set values. Only those values are changed for which a new value has been given.

#### 4 T Test temperature

Tests the process temperature. Holds the process's progression until the condition is fulfilled.

#### 5 T Time

Tests the time. Holds the process's progression until the condition is fulfilled.

#### 6 P Stop

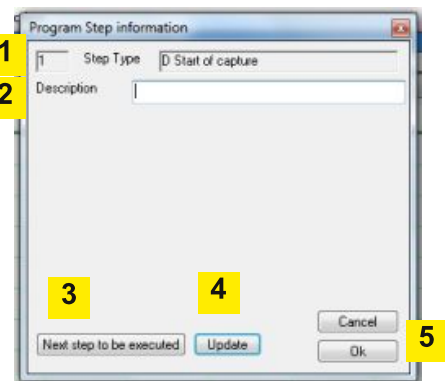
Stops the process and releases the points.

#### 7 P Jump

Sets the next executed step (jump).

#### 8 C Set value.

#### 9 C Test value.



### Changing the steps' values

Steps added to the step list contain settable data that must be set before using the program. The setting is done by selecting a row or a step from the step list. Double-clicking or the "Enter" button opens the "Step data" dialogue, in which the values are set. The settings to be changed vary according to the step type. Fields that are common for all step types are as follows (Picture above):

#### [1] Step type

Step's type number and type. These cannot be changed, but if the step is incorrect, it can be deleted from the list with the "DEL" button and a new step is selected.

#### [2] Description

Step description in the step list and in diagram's printouts. The field is not mandatory.

#### [3] Next step to be executed

From the button, the selected step is set to be executed next or it is set as the program's starting step. If the process has never been executed before, the first step of the list is by default the starting location of the execution. The green base color of the step list's step number indicates the next step to be executed.

#### [4] Update

Reads and updates the changed values in the step list and in the diagram display describing the instructions.

#### [5] Cancel and Ok

"Cancel" closes the dialogue and abandons the changes made if the "update" button has not been used. "Ok" reads and updates the changes and closes the dialogue.

*There is no need to close the dialogue in between, but it may be left open while the step list is being modified. By selecting the second step from the step list the values of the previous step are read and updated, which makes it unnecessary to separately press the "update" button.*

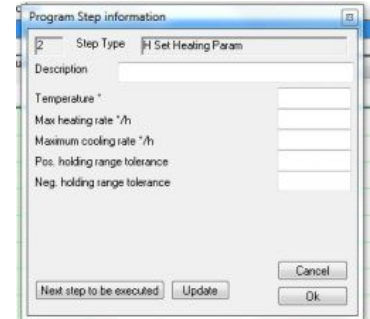
**A detailed description of the step types**

**Starting the recording (1)  
End of the recording (2)**

This step does not need any parameters. The starting description is used later on in order to identify the storage, which is why it is advisable to write a text that describes the storage in it. E.g. Preheating, Annealing etc.

**Heating parameters (3)**

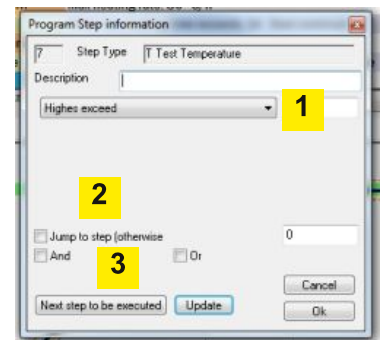
The step changes the process's set values. Only those values are changed to whose field a new value has been typed, i.e. an empty field does not have any effect on anything. If one wants to remove a setting from some setting, an asterisk (\*) is typed in the field as the value. If the temperature's set value does not exist, 0% will be set as the controllers' output power. A missing value in the rate of change means that the rate of change will not be limited, but the temperature's calculated reference value is changed immediately (free rise/drop). Tolerance's missing value means that the limit is not in use. All values are given without quality.



**T Time (5) , T Temperature (4)**

Time or temperature testing. The program's execution either waits for the condition to be fulfilled, or it moves (jumps) to the given step. Once the condition has been fulfilled, the execution proceeds to the next step.

- [1] The value given for testing (comparing) can be given without quality.
- [2] If the condition or comparison is not TRUE, the program's execution waits (stops). However, by checking this selection the execution moves on to the step number given in the field.
- [3] A number of testings can be joined together, in which case they all must simultaneously be true (AND), or one of them has to be true (OR), so that the execution of the program may proceed to the next step.



**T Time (5)**

**Hold time (min)**

How long all the points connected to the process must be within the hold range. The hold time calculator zeroes when the heating parameters are reset with the process instructions' step (Type 7). The hold time of the previous phase increases until the temperatures are within the previous hold range. Therefore the measured hold time of the phase is usually slightly longer than the set hold time.

**Phase time (min)**

The amount of time elapsed since the previous setting of parameters (type 7). This testing does not take the temperature into account, which is why for instance during the rise a phase time that is too short results in the rise ending too early.

**Real time**

Waiting for clock time, date or day of the week. A missing part of the field means that it is the same as currently. The date parts are separated with dots, hours and minutes with colons. Date and clock time must be separated with a space (' '). The field parts can be given without leading zeros, hence 1.1.12 means the same as 01.01.2012.

Next, examples will be given on when the real time testing is TRUE (Execution continues).

1.1.12	The first day of January in 2012. The clock time is the same as currently
1.1	The first day of January next year. The time is the same as currently
1.	The first day of the next month. The time is the same as currently
11:12	At 11:12 on the next day
11:	At 11: on the next day, the same minutes as currently
:22	Next hour when the minutes are 22
:0	When the next hour turns
0:0	Turn of the next day
	MON,TUE,WED,THU,FRI,SAT,SUN the day of the week
MON	Next Monday this time
TUE 4:0	Next Tuesday at 04:00
WED 0:	Next Wednesday at 00:00

The date and the day of the week cannot be used at the same time. For instance testing 7:0 is true on the next day at 07:00.

#### Temperature (4)

Comparing a given process temperature to the value given in the field. Variables used in the next testing:

Reference value	Process's set temperature if the hold time, otherwise the value calculated according to the rate of change.
Average value	Average value of points involved in the process. Although a point is involved in the process, its value will not be used if it is not marked as to be used in the process.
Lowest	Lowest value of points involved in the process.
Highest	Highest value of points involved in the process.

#### End of the process (6)

This step will end the process and relief the used points. Next time the process will continue from next step if there is the next step.

#### Jump (7)

Shifts or jumps to the given step. If the target step has not been given, the execution of the instructions is stopped, and the user must select the next step during execution.

#### Set value (8), Test value (9)

The IS system contains a large number of determined variables. Many of the processes' and controllers' settings and measuring are defined values, i.e. variables which are referred to with determined ID numbers. Also the user may determine these variables, and also connect the variables to the I/O points if needed. These variables may be set in the process instructions, and their values may also be tested. With variables connected to I/O points, external devices such as lids, fans, signal lamps etc. can also be controlled. Further information about the variables and their use can be found in Section 2.

## [10] Add a point



Point is a common name for all I/O points and controllers selected for the project. Several devices may be connected to the same process, in which case the points are selected from a number of devices. If one wishes to save the point values of the expansion module, they must be defined virtually in the control unit (ISC, ISQ). Defining the points has been handled in section 2: I/O Configuration.

Points selected for the project have been listed in the point list, which should be kept visible when selecting the points. The points can only be selected if the process is not running.

Select the points used in the process

Y	Device	Type of the point	Pol..	Temp.	ID	Project (in use)
X	Q184	Co 3	1		1	
X	Q184	Co 2	2		2	
X	Q184	Controller	3	29°C	3	
	Q 2	Controller	4		4	
	Q 5	Controller	5		5	
X	Q184	Controller	6		6	

Show all devices (also offline devices)
  Add Serialo
  Show ex MP

**More than one point at a time can be selected from the list.**

**Only those points that are not yet in the project can be added to it.**

### [1] Connection to the device

- X on a green base = there is a connection to the point and it is available
- X on a yellow base = there is a connection to the point but it is in use
- Empty = no connection to the device, not known if it is on

Also points to which there is no connection, or points that are in use, can be selected to the project, but the process cannot be started until there is a connection to the devices and the points are available.

### [2] Device label

Device in which the point is located. If the points and controllers have not been named after the device, points with the same name can also be found in other devices.

### [3] Point type

Point type is the type of that adaptor to which it is connected. Device's controllers are in the directory before other points. If the process requires a larger number of test points than controllers, the temperature measurement only can be selected from the controller. For instance Controller 6 Current value (temperature), adds the test point of controller 6 to the project.

### [4] Point number

Device's controllers have been numbered from 1 to 6 and other points from 1 to 42. There is temperature after a point if it is connected

### [5] The variable ID determined in the I/O configuration.

### [6] When the point is in use, the project's registration number

### [7] Show all devices

By choosing this, the points of all devices in the device list are added to the list, regardless of whether or not there is a connection to them at the moment. See section 1.

### [8] Add Ser no.

By choosing "Add Ser.No" selection, the program adds devices serial number front of ID. This is useful when different devices uses same IDs. (recommended)

### [9] Show ex MP

By choosing "show ex MP", all connected extra measurement points will be shown in the list. There must be connection to the device.

### [10] Select

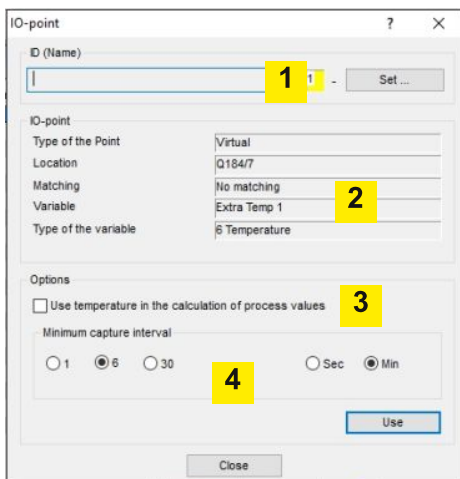
Point or points are added to the project with this button. The dialogue will be closed with the "Close" button.

***The controller, where the first point (controller or extra MP) is added, will be the Master***

## Change the extra measurement point's settings

By default, the values specified in the I/O settings are used as the extra point's label and presentation color. If there are no such specifications, PC settings' colors will be used.

By double-clicking the extra point's row, a point setting dialogue will open.



### [1] Point's label and color

Label and color are only used in this project. The label can be changed in the dialogue that opens by pressing the "Set" button.

### [2] Info

Point's information

### [3] Use in the process

Extra points whose type is temperature (6) can also be used when calculating the temperatures of the process. In this case the point temperature is taken into account in the progression of the process, just like the controllers' temperatures.

### [4] Capture interval

The values of the points are stored at regular intervals into the device's memory. Unlike in the controllers, the value change does not signify. It is advisable to keep the storage interval as long as possible in order to save up memory. The changes in the storage interval take effect after pressing the "Use" button.

## [11] Process settings



*The OK button enables the changed values immediately if the process is running.*

### [1] Index of the process and the process instructions

When transferring the process instructions to the device's memory before starting the process, the device automatically selects the next empty location (1-24), or, if none are available, a location that has not been used for a while. The instructions can, however, be downloaded to a specific location, i.e. an index, if it is later on referred to in other processes, or for instance with the device's buttons. Likewise, the first available location is selected for the process in the process list (1-6). The defined index is used in fixed processes, in which case tally lights, switches etc. are connected to it. The list's selection '-1' stands for an automatic selection.

### [2] Synchronization of controllers

If more than one controller or a point that measures temperature is connected to the process, the program monitors the temperature differences between points. If the differences grow too big during rising and dropping, the set rate of change will be limited. For instance in rising, if the temperature of some particular point does not rise by the set rate because the power has run out, other controllers reduce the rate of rise respectively. Temperature difference is calculated from the process's calculated reference value and the point's temperature. In the following fields the temperatures and how big the differences can be are set:

"Limiting the rate of change if the temperature is above (0=Always)" :  
 " " If the field is left empty, the synchronization is not in use  
 1-1800 Temperature above which synchronization is in use  
 0 Synchronization is in use in all temperatures

"Limiting the rate of rise if the temperature differences above (0=Not in use)" :  
 "Limiting the rate of drop if temperature differences above (0=Not in use)" :  
 0 Synchronization not in use  
 1-100 Largest difference between the calculated instructions and the point's temperature.

### [3] Temperature escapes out of control

The actual (measured) process temperature may in some situations deviate from the desired reference temperature so much that it requires further measures. Normally, for instance the power running out during the rising does not cause any problems, because the synchronization stops the increase in reference value if the measuring points do not keep up. For instance power failures, fuses or stuck contactors may cause problems. If the average temperature value of all points in the process deviates from the calculated or set reference temperature, above the set limit, the following measures may be taken:

- "Deviation greater": When the temperature difference is greater than this limit, the selected procedure will be carried out
- "No procedures": The program will continue to operate normally and the reference value will be kept in the calculated value. If for instance the electricity goes off, the temperatures drop, and once the electricity goes on again, the temperatures rise to the calculated value without any limitations
- "Fix": The calculated process reference value is changed so that the process's temperature error will be the set deviation. The process moves to the rising or dropping phase depending on which direction the temperatures are corrected.
- "Pause": The process is set to a "Pause" state, whereby the reference value and the program execution will be left where they are. The "Pause" state must be set off separately with the "Pause" button.
- "Stop": Instead of continuing the execution of the process, the process is stopped. The process must be restarted from the desired phase.

#### [4] Balancing the powers of the controllers

The balancing is used in ovens when one wants to balance the powers of different controllers and oven blocks. The load or the impact of the controller's power may be distributed so unevenly that only one of the blocks attempts to heat the entire oven, while the other blocks are without powers. Consequently, the power is insufficient and, due to the loaded block falling behind, the process has to reduce the rate of rise. The problem can be solved by driving the less loaded blocks in a slight overheat, which drives them to start taking power. The balancing of powers may be performed in ten stairs 0-100%. With the setting 0% each controller operates independently by only following its own temperature sensor. With the setting 100% all controllers use the same temperature, the measured temperature of the process (average value of points). In this case also the output powers of controllers are the same, providing that also the controllers' parameters are the same. In other words, with the setting 100% the temperature differences between the controllers are not corrected, and controllers operate as if only controller was connected to the process. The balancing can be changed by means of the sliding control.

#### [5] Control parameters

Upon the process start-up, the parameters of the controllers are selected from ten predetermined series. The series are determined in the controller's default settings (DPM2\_). The parameters of the series (P,I,D, Control cycle, limitation of the approach speed, power aid when the rate of change changes) are selected as follows:

- |      |   |
|------|---|
| 1-3  | Heatings that react quickly, such as inductive heating and gas heating. |
| 3-7  | Heatings on resistance mats.  |
| 6-10 | Slow oven heatings.   |

Series "Zero" will not be used, but the controllers' parameters will remain as they are. Different parameters may therefore be used in the controllers, and the parameters remain unchanged from one process to the other. If this setting is changed when the process is on, all of the process's controllers immediately enable the new series.

Process star power (default power) = Power in the beginning of the heating. Temporary.

#### [6] Alarms

Alarms are notifications of unexpected events that may affect the activity of the process. Alarms are recorded in a log, they are communicated to the user and the devices process them according to predetermined instructions.

Measurement sensor: the breaking of the sensor or other surprising behavior. In the controller's default settings (DPM2\_), the controller's functions are specified in case the transducer is damaged during the process.

Output power: Usually the defects in the output power can also be detected in the temperatures after a short while. However, a quicker reaction is possible if the controller's output power is being monitored.

Overtemp., Undertemp.: Limits for exceeding or falling below the point temperature, which causes an alarm. The limit shall be given in positive degrees. For instance if the value of overheat is 10, it means 10 degrees over the calculated reference value. If the value is missing (empty field), the boundary value is not in use.

The alarm is only given once: Sometimes it may be the case that the temperature, divergence or sensor swings near the limit and therefore causes continuous alarms. If the field "Alarm is given only once" is checked, another alarm will not be given about the same subject matter until the process instructions have changed the set temperature.

#### [7] Settings

"Process start power (default power)" Will set start power for process, when the controllers will buust the setted power to the process start. Value can be 0-100 %, 0= same as empty, then the program will use the setted heating rate.

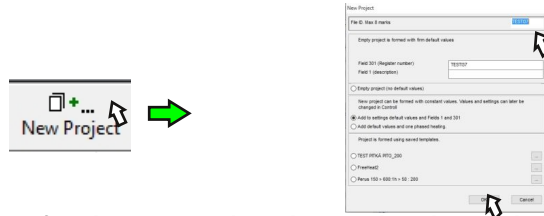
"Pre-heating (hold)" will affect to all hold phases in the process. Setting will affect to PID parameters.

"Direct controllers in use" will be chosen then when direct control box is in use (potenttiometers)

# Heating without process plan (instructions)

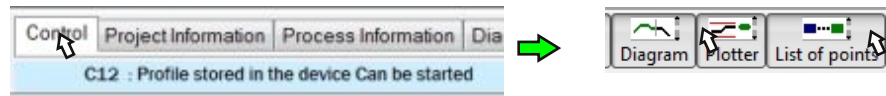
Normally, process instructions are composed for heating processes by means of the step list, but all the same operations may be carried out manually, and the outcome will be exactly the same. Manual heating may in some situations be even easier, if for instance it is not known beforehand what operations are performed at what time. It is advisable to start practicing the heating without the process instructions.

## 1. Creating a new project and selecting it in the work window



Creating a new project whose registration number is TEST1

## 2. Opening the project's "Control" tab



Opening the project's "Control" tab

Check that "Diagram" and "Point list" displays are on

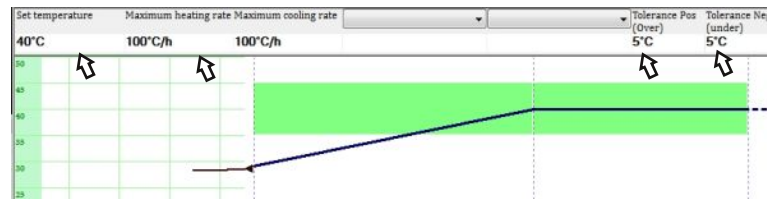
## 3. Selecting the points to be used (controllers, measurement points)



Opening the dialogue in order to add the point to the project

Selecting an available controller. Pressing the "Select" button. Closing the dialogue. Checking from the point list that the correct point was selected.

## 4. Setting the temperature and possibly limiting the temperature's rate of rise



Setting the temperature and the greatest rate of rise (in the image 40 degrees and 100 degrees per hour)

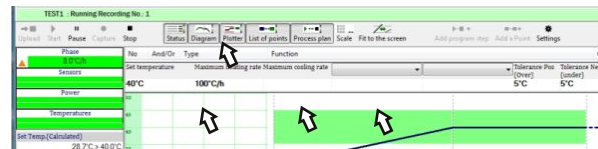
## 5. Starting the heating, possibly followed by storage for the purpose of subsequent documentation.



Starting the process (heating) from the "Start" button

Starting the capture if one wants a document of the heating

## 6. Changing the set temperature and limitations of the rates of change if needed, and finally, stopping the heating



Changing the temperature and the rate of change if needed, and finally, stopping the process from the "Stop" button

## Creating the process plan (instructions)

A step list will be composed of the process plan, which will be executed during the process step by step. The execution starts normally from the beginning of the list and proceeds downwards towards the end. Some of the steps set the process parameters, such as temperatures and tolerances, whereas some of the steps hold the progressing of the list by waiting for environment variables, such as temperatures.

Process plan can be made in two different ways:

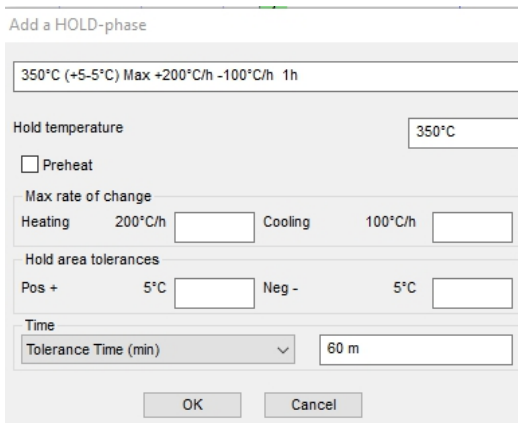
- By clicking mouse's right button (Fastest and easiest)
- With step list (For more complicated processes). Using step list instructions in pages 25-27

## Making process plan in fast and easy way

Start by clicking mouse's right button on diagram area --> opens dropdown menu

- Add 1. hold phase/ Hold phase to the end
- Add a hold phase to the heating/ cooling phase
- Add a heating/ cooling rate change
- Add the end of heating
- Remove phase
- Remove the last phase

Choose "Add 1. hold phase/ hold phase to the end" --> opens "Add a HOLD phase" -window (picture below)



**"Pre-heating" is used, when pre-heating is wanted to a chosen hold-phase. Settings affects the PID parameters, does not care about alarm limits or the positive tolernace limit during the hold**

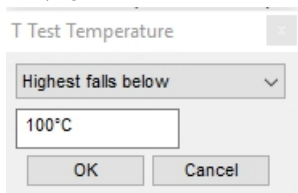
Add the values you want

**Note!the first rowand the values that are shown before the test fields are default, that are used, if the fields leaves empty.**

When you are finished press "OK"

Next add the end to the heating plan. Click mouse's right button on the diagram area and coohe from the dropdown meno "Add the end of heating".

ISPort adds automatically end temperature to the heating plan. Value can be changed by clicking the yellow arrow in the end of heating plan --> opens dialog (picture below), where you can change the temperature and choose the value measure(highest falls below, average falls below... )



**All values can be changed by clicking the yellow arrows and yellow squarres on the heating plan.**

**PH = Pre-heating (to chosen hold phase)**

More phases can be added by clicking the mouse's right button. Ex. choose place from the heating plan and add there heating rate change.

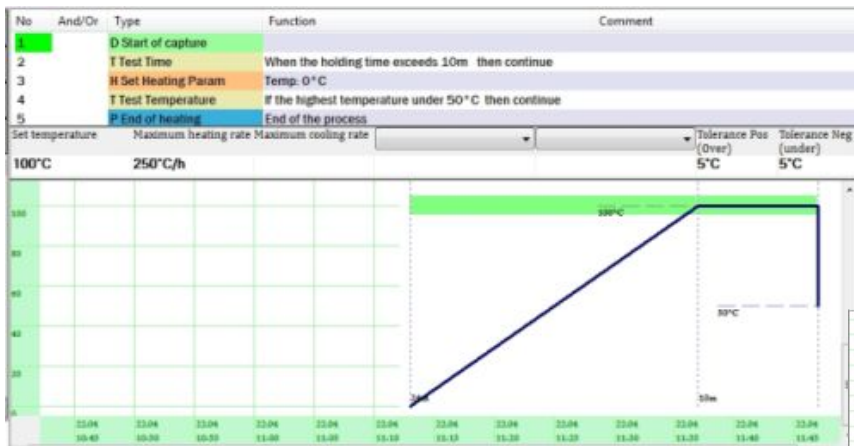


## Examples of process plans

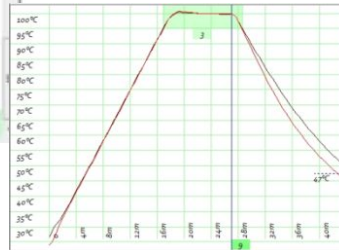
### Example 1

- Storing the process
- Temperature is raised to 100 degrees at the rate of 250 degrees per hour
- Kept at 100 degrees for 10 minutes
- Free drop without power
- Ending the storage and diagram once the temperature of the hottest point is below 50 degrees

Numbers on the right side of the diagram refer to the step list's steps.

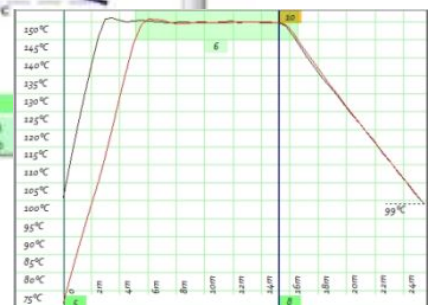
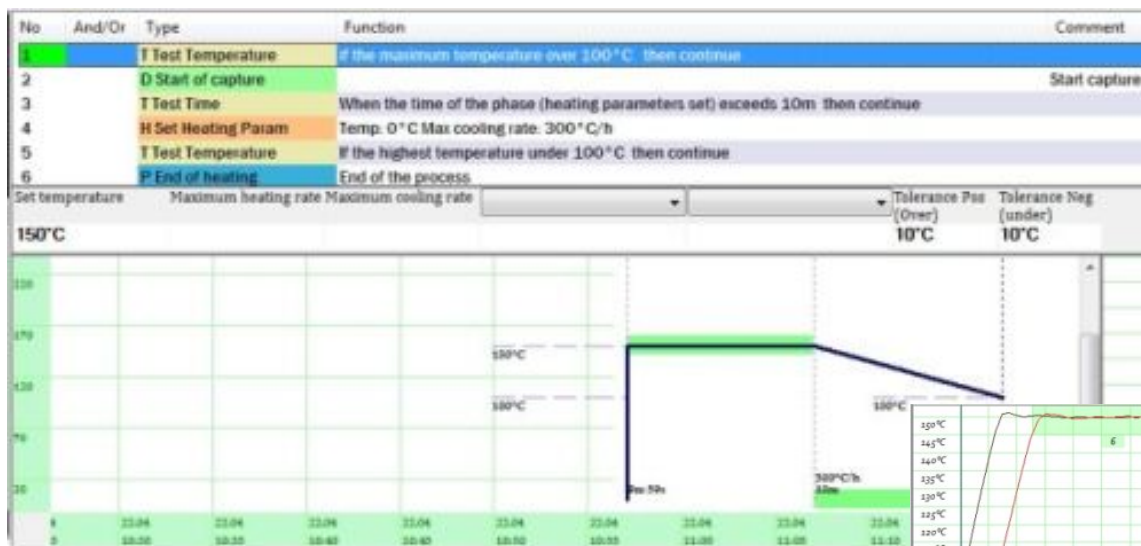


Heating starts with the set values: temperature 100°C, biggest rate of rise 250 °C/h, tolerances +5 °C and -5°C. Once the measured temperature of the points has been 100 degrees +5 °C for 30 minutes (step 2), the process temperature is set to zero (step 3). Although the temperature never drops this low, it does not signify. Waiting until the highest temperature is below 50 °C (step 4), at which point the process is stopped and the storage is finished.



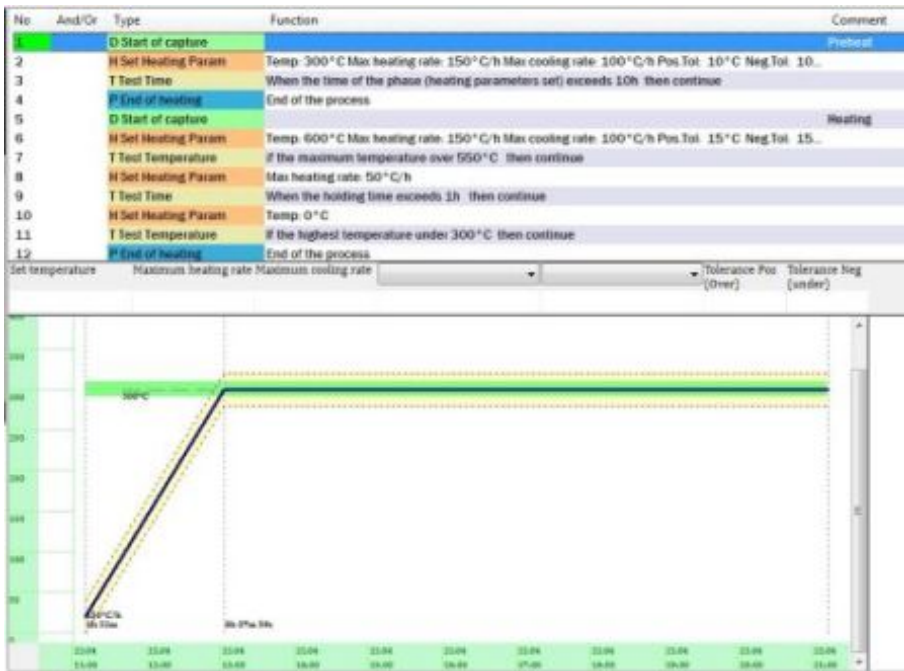
### Example 2

- Raising the temperature to 150 °C degrees without restrictions
- Storage is started when the temperature is above 100 °C
- Kept at 150 °C degrees for 30 minutes
- Dropping the temperature 150 °C per hour to 100 °C
- Stopping the process



**Example 3**

- Max heating rate 150 °C/h and max cooling rate 100 °C/h
- Preheat 300 °C.
- annealing °C +10 °C, 60 minutes.



Two or more heatings executed separately may be combined in the same process instructions. The previous process stops automatically at the "End of heating" step and the step following it will be the next step to be executed. When the process is restarted, it will continue from where it last ended. The next starting point can be set in the "Step Data" dialogue, or by clicking the starting point with the right mouse button, and selecting "Set the next to be executed" from the menu. The part that starts from the first to be executed and ends with "end of process" is always presented in the diagram. Also the last set values are recorded, and when the same process is restarted, it starts with the same set values with which it previously ended. The set values can also be set in the process instructions, as has been done in this example.

Preheating is set to continue for 10 hours, but instead of time testing, for instance the "shift" step may be used without the target step, in which case the execution of the program remains unfinished. In all cases the process may be stopped by setting the "End the process" step (4) as the next to be executed. This can be done also by pressing the button bar's "Stop" button, but in that case the next step to be executed must be set to the first step of annealing before start-up (5).

Rise of annealing has been slowed down 50 degrees before the holding temperature with steps 7 and 8.

In the "Additional settings of the process" dialogue also alarm limits +30 °C have been determined for the process.

## Project information

Control Project Information Process Information Diagrams Log Devices Print

The data generated during the process, such as measurements and events, is stored in the device's memory during the process and moved on the PC during and after the process. If you want to document the process, the collected information is saved on the PC in a file named after the project's registration number. Each process execution is stored as its own run set, hence max. one storage is saved per one process start-up. Usually the storage is started immediately after the process start-up and finished when the process is stopped. There may be max. 250 storages in one project. The number of unstored run sets may be infinite.

In the IS system all data has been determined and numbered with their own ID numbers. These individual pieces of data are called data fields or just fields. The numeric fields have a specified quality and presentation form, and the largest possible length and number of rows have been determined for text fields. Most of the fields determined in the system are not interesting to the user, and they are displayed and printed on documents only if one particularly wants so. The most common system fields have been listed in the IsportC.txt file.

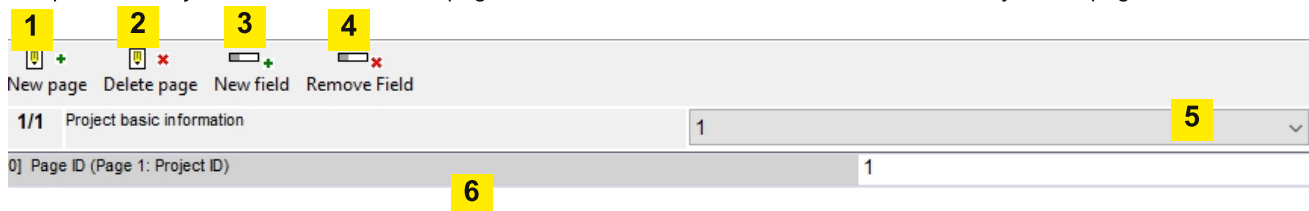
Documents need peripheral information that the system, on the other hand, does not need. This data is called user's fields, or data fields determined by the user. These fields, too, have been numbered with their own ID numbers, and the data and quality therein have been determined in a separate file ISPortC.txt. There may be at most 500 different fields defined by the user, but usually a few dozen is a sufficient number.

User's field are saved in the project file by using forms i.e. data pages. One page (No 1) has automatically been added to each new project, and one field (ID=0) in it.

It is advisable to place the fields relating to the project in general on the first page, i.e. the project page, because when searching for the pages' information later on, for instance for a certificate, the fields are retrieved last from the project page. If the field's data has not been given on other pages, the page one of the project data will be used. The same field may be in use again on another page, but the data therein may not be the same. A good practice is to take own page for each customer, in which case information about customers involved in the same project can easily be kept apart. Pages in this tab and the fields therein relate to the whole project and all its storages. The program automatically adds one page for each individual storage. The pages are located in the project's tab "Process information".

## Adding and removing a field on the page

Open the "Projekt data" tab, select the page on which a new field will be added. If necessary a new page must be created.



### [1] New page

New page is added at the end and set visible at the same time (active). The page order cannot be changed. One field (ID=0) is automatically on the new page. The content of the 0 field is used as the page's label, and the label of the first page is also used as the label for the entire project. Page label should be left where it is, because it eases the identification of the page later on. If the data on the page is for instance customer data, it might be useful to use the customer's name as the page label.

### [2] Delete page

Deletes the page that is active (visible). The page and its data cannot be restored later on, hence one should avoid deleting useful pages.

### [3] New field

Opens the "Select a field" dialogue, from whose list the field to be added is selected.

### [4] Remove field

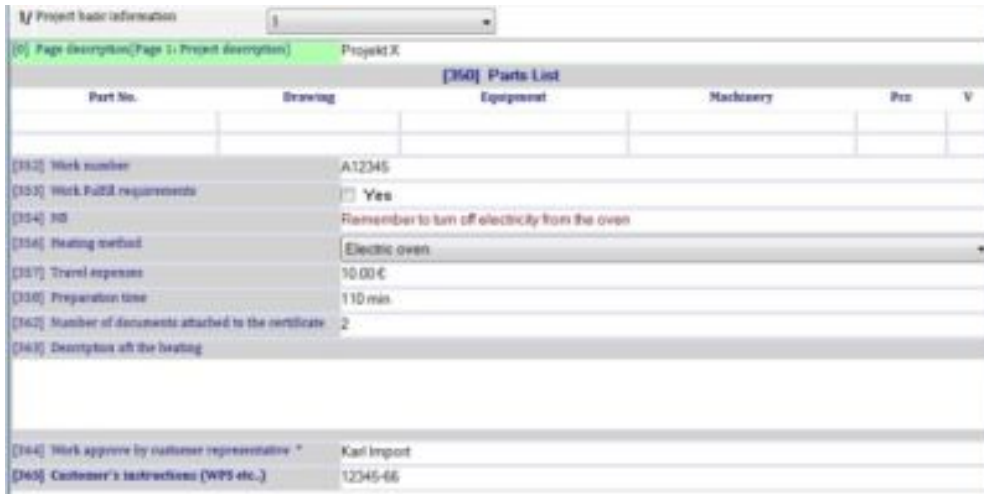
Deletes the active field from the page. The base color of the active field's heading is green.

### [5] Selection list of the page. Active page is selected from the list.

### [6] Base of the page on which the fields are located

### An example of different types of fields and their use.

The field headings are not saved in the project file, which is why the headings change when the definition file is changed.



*The TAB button selects the next field, and TAB+SHIFT the previous field on the page.*

*The page's data is automatically saved when moving from one page to another.*

### Fields used in the example

0 Text field	Modified Page label, and since it is the first page, the label of the whole project
350 Table	Two rows and 6 columns. The height determines the number of rows. Column headings separated with semicolons determine the number and width of the columns.
352 Text field	Modifiable
353 Check box	(check)
354 Text field	Read only
356 Selection list	
357 Number field	Currency
358 Number field	Time
362 Number field	No quality

An optional extended attribute has been set to the following text fields of the example

363 Text field	Heading on top, normally on the left
364 Text field	Mandatory information. The process cannot be started if the information is missing. Only used on page 1
365 Text field	Emphasized text in the heading, important information

## ISPortC.txt File

All fields, system fields and users fields are defined in file ISPortC.txt. For every field there is one line in the file. Position of the line in the file is not important. Definitions on the line are divided by commas.

### Type, ID, Flags, Height, Character count, Default text

#### Type

First character on the line is type of the variable:

A	Editable text field
B	Check box
C	Message filed (read only)
F	Table (many editable text fields)
I	List
Q	Currency
R	Time (past)
W	Number (integer)

#### ID

Page description and project description	ID=0
PC and program	ID=1-9
Device	ID=10-39
Project	ID=50-79
Run	ID=80-299
User fields	ID=300 - 1000

#### Flags

L	Title on the left (default)
S	Text field (default)
I	Number
O	Title on the top
*	mandatory fields. Process can not be started before this field filled, used only on page 1
A	Important field, Bold

#### Height

Given as lines.

Character count

Maximum number of characters a user can enter in the field. This ensures that the data in the field fits on later prints in the available space.

#### Default text

Type A : Default text.

Type B : Text after the checkbox

Type C : Message

Definitions for fields use in the example

```
F,350,Parts List;Part No.;Drawing;Equipment;Machinery;Pcs;V,0,2
F,351,Accessory **** List of All Parts -----;Type;Manufacturer;1,0,3
A,352,Work number,0,1,50
B,353,Work Fulfill requirements,IL,1,50, Yes
C,354,NB,0,1,50,Remember to turn off electricity from the oven
I,356,Heating method;Portable Power;Electric oven;Gas oven,SL,1,50
Q,357,Travel expenses,IL,1,50
R,358,Preparation time,IL,1,50
W,362,Number of documents attached to the certificate,IL,1,50
A,363,Description of the heating,OS,4,300
A,364,Work approve by customer representative,SL*,1,50
A,365,Customer's instructions (WPS etc.),ASL,1,100
```

## Process information

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For each stored run set, the program automatically creates own page for the storage's peripheral information. By its structure and use the page is similar to the previously described "project information" page. Contrary to the former, the selection of the page to be modified is done by using the selection list of the stored run set. The same fields as on the "project information" pages may be placed on these pages.

Recorded process 1: 22.04 08:24

*Select the process from the list*

***Process information can not be used, when only one process is allowed in a project. Then use only project information.***

***Process information fields should be removed, also empty fields, before selecting "only one process per project" from ISPort PC-settings. Otherwise process information are active and those can not be changed.***

# Diagrams

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Diagram tab is a easy way to look at the results in graphical form. One page is chosen at a time, from the "Recorded process" list.



## [1] Button bar

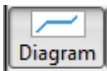


Diagram display (2) On/Off.



Event list (4) On/off



Zoom (5) On/Off



Settings ...

### Settings dialogue

With the help of the dialogue, the diagram parts displayed on the diagram display [4] are defined. The made selections are stored in the project file, so they are used later on in printings, and they are therefore project-specific. The meaning of the selections both in the diagram (Diag) and the event list (EL):

### Selections add time lines on the diagram display and scales in its bottom edge

Time since the beginning	Time elapsed since the beginning of the run
Date	That of date and clock time
Time	That of clock time

### The selections divide the diagram's vertical space into the following equal-sized parts

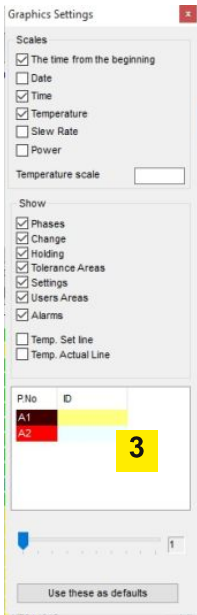
Temperature	Temperature
Rate of change	Temperature's rate of change
Power	Power of controllers

### Selection of parts shown in the temperature diagram

Phases	Steps of the process instructions and their numbers.
Change	Start-up of the rise and drop phases, the set rate of change, starting and finishing temperature and the measured rate of change
Hold	Diag: Start-up of the hold phase, the set holding temperature, Measured average value of the holding temperature, smallest and largest measured temperature during the hold phase and time elapsed during the hold phase Diag: Area that composes of the set temperature and hold tolerances added to it. EL: Limits of the hold range, and how long the points have been within the limits.
Hold range	

Settings	Not in use in this version
Own areas	Not in use in this version
Alarms	Alarms defined in the process's additional settings

Ratio	Sliding control by which the diagram's time axis may be divided into maximum of ten sections.
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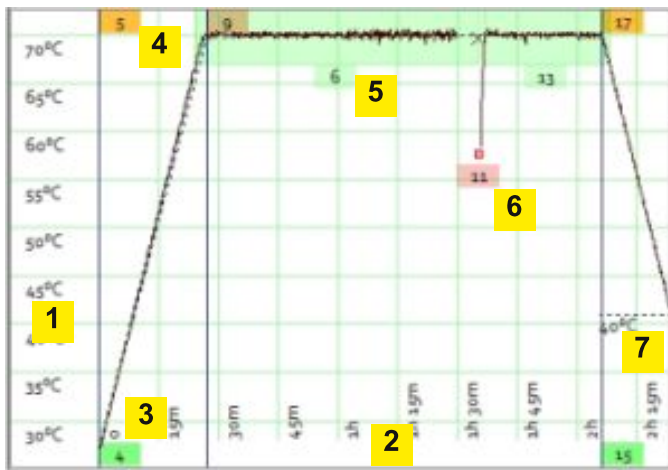


Update

During the examination, the diagrams and the event list will not be updated with the data possibly read from the device. The latest data can be read and updated on the displays from this button.

## [2] Diagram

Vertical scales in the graph is automatically selected by the basis the maximum measurement temperature, the rate of change or efficacy. The horizontal scale is chosen so that the graph is the entire image. If the process is still running, it is scaled so that the part driven is fitted in the display. The time scale may be changed by the slider control in the "setting" dialog. Numbered squares refer to the list of events. By clicking on the event square, it will open on the Zoom screen.



### [1] Temperature scale

The temperature scale is selected automatically on the basis of the realized temperatures

### [2] Time scale

With ratio 1/1, the entire implemented run is adapted to the diagram. The ratio can be changed between 1 and 10.

### [3] Steps

The green signs in the bottom edge are the initial signs of the steps

### [4] Phases

Signs on the upper edge are initial signs of the rise, drop and hold phases

### [5] Hold range

Green area limits the hold range. The hold range starts when all points are within the tolerances, and ends when the first step leaves the range. A number of hold ranges may belong to the same hold phase if some temperature occasionally slips outside the hold range. The controllers slightly change the tolerances, which is why the hold range's limits are half a degree tighter at the beginning and half a degree looser at the end.

### [6] Alarm

Alarms are marked with a red square. In the image there is an underheat alarm, which has been caused by the breaking of a sensor. The breaking of the sensor is marked with letter x.

### [7] Finishing temperature

Finishing temperature of the capture

## [3] Point list

List of points involved in the project. By clicking on the point's row the point can be selected or removed out of sight on the diagram display. Hidden point's color is light grey on the list. It should be noted that the selections are saved in the project file and they are used in the printing of the certificate. By double-clicking on the point's row the "point's label and color" dialogue will open, in which the point's color and label in this project can be changed.

Type	ID (name)	Temp.Mes.
1	S85-2	125.8583 kWh
2	Extra Temp 2	

*By clicking the line with mouse, the point is switched On/Off*

## [4] Event list

List of events during the run set. The run set events have been numbered with consecutive numbers and colored with colors that describe the event. List's events have been located on the diagram display by using the same numbers and colors. By clicking on an event on the list, it opens in the "Zoom" display (if in use) for the purpose of closer scrutiny. By double-clicking the event opens in the "Event" dialogue, in which settings related to the event can be changed. For events that are not presented in the diagram, the event number's color is blue on a white base.

No.	Set / Measured
3	Kuumennus 1 - Step 2
4	Heating 200°C/h - 45 > 298°C (124°C/h)
5	Over temperature 93°C
6	Over temperature 176°C
7	Holding Area - 204,205°C 10m 18s
	- Set / Measured - 200°C/h / 198°C/h
10	Holding starts
12	Under temperature 289°C

*By the click of the mouse the event opens in the "Zoom" display*

*By double-clicking the event opens in the "Event" dialogue*

*The event number's color is blue if the event is not presented on the diagram display.*



## Event dialog

Detailed information about the event, and about event-related settings

### [1] Description

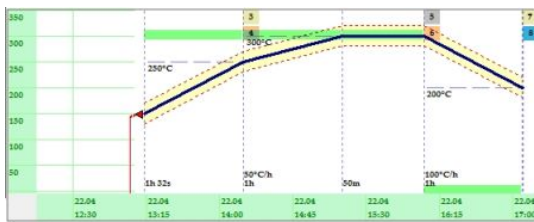
The description given for the event by default cannot be changed. The description is used in a certificate's event list, for instance.

### [2] Displaying

The event may be removed out of sight if desired. A hidden event will not be displayed on the diagram display or in the event list of printouts later on.

### [3] Heating phase continues

The setting influences the grouping of events in the process's printouts. In the printouts the heating phases are grouped according to the steps in the process instructions, i.e. phases that belong to the same step are in the same block in the printout. However, sometimes it is more logical to group several steps in the same group. By checking this selection in the settings of the next program step, it will be connected to the previous program step. More detailed information can be found in the examples.



In the image, the heating's rise phase consists of two parts, first rising 250 °C/h to 60 °C, reducing the rate of rise 50 °C/h with program step four. The printout is slightly clearer when both risings are presented in the same phase.

Nopea nosto		Hidas nosto	
6 Nosto 250°C/h	27 > 60°C (247°C/h)	12 Nosto 50°C/h	60 > 70°C (43°C/h)
		14 Pitäjä	60-80°C 28m
		18 Pito 70°C	70°C (69-70°C) 7m 12s

Nopea nosto		Hidas nosto	
6 Nosto 250°C/h	27 > 60°C (247°C/h)	12 Nosto 50°C/h	60 > 70°C (43°C/h)
		14 Pitäjä	60-80°C 28m
		18 Pito 70°C	70°C (69-70°C) 7m 12s

In the upper image the steps have been presented in the printout's phase list without combining. In the lower image the event "Slow rise" has been marked as a continuation of the previous step.

## [5] Diagram's partial enlargement (Zoom)

Some of the temperature diagrams can be examined in the "Zoom" display. The diagram's part is selected by clicking on the event row on the event list, or by clicking on the event's number square on the "Diagram" display. The intention is to limit the temperature and time so that the diagram can be presented as accurately as possible. Rise, hold and drop phases, the program steps and hold ranges are displayed in their entirety. Point-like events, such as alarms, are displayed on the left edge of the "Zoom" display. In the upper edge of the box there is a numeric explanation of other events that are in the selected area or that are starting in that area.

## Log

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The earlier "Diagrams" tab showed the collected data in the storage in graphical form. The "Log" tab shows the same information as a numeric list. In this list one storage information is showed at a time. The storage is selected from the "Saved run set" list. This tab is merely for the purpose of examining the information, as none of the storage values can be changed.

PC:Events	ID	Type	Time	Value	Event
<input checked="" type="checkbox"/>	0	PC	25.02.2016 16:33:13		Started: The initiator: X ↑
<input checked="" type="checkbox"/>	1	PC	25.02.2016 16:34:37		Stopped: The initiator: X ↓
<input checked="" type="checkbox"/>	2	PC	25.02.2016 16:36:41		Started: The initiator: X ↑
<input checked="" type="checkbox"/>	3	PC	25.02.2016 16:37:20		Stopped: The initiator: X ↓
<input checked="" type="checkbox"/>	4	PC	25.02.2016 16:37:33		Started: The initiator: X ↑
<input checked="" type="checkbox"/>	5	PC	25.02.2016 16:38:10		Stopped: The initiator: X ↓
<input checked="" type="checkbox"/>	184: 6	EXA...	25.02.2016 16:37:35		Start of recording 3: 25:
<input checked="" type="checkbox"/>	184: 7	EXA...	25.02.2016 16:37:37		184> S: 2 3: 2
<input checked="" type="checkbox"/>	184: 8	EXA...	25.02.2016 16:37:37		Alarm -> controller: 3 Se
<input checked="" type="checkbox"/>	184: 9	EXA...	25.02.2016 16:37:43		Temperature heating sta
<input checked="" type="checkbox"/>	184: 10	EX...	25.02.2016 16:38:09		Heating Ready -> Tempe
<input checked="" type="checkbox"/>	184: 11	EX...	25.02.2016 16:38:09		Energy -> controller: 3 0
<input checked="" type="checkbox"/>	184: 12	EX...	25.02.2016 16:38:10		Energy -> 0.0000 kWh
<input checked="" type="checkbox"/>	184: 13	EX...	25.02.2016 16:38:10		End heating ---
<input checked="" type="checkbox"/>	184: 1	184: 3	Boolean	25.02.16:37:36	V: 1.0
<input checked="" type="checkbox"/>	184: 1	184: 3	Heat slew rate	25.02.16:37:35	-6.8°C/m
<input checked="" type="checkbox"/>	184: 1	184: 3	Power %	25.02.16:37:35	0.0 kW
<input checked="" type="checkbox"/>	184: 1	184: 3	Temperature	25.02.16:37:51	

By clicking the column heading "Time", the list is organized in chronological order

### [1] Events shown on the list

#### PC: Events

Starting and ending the process from the PC

#### Proj: Steps

Events during the process execution

#### Point: Temperatures

Points' temperatures

### [2] Select all points / Remove all selections

Selects or removes the selection from all points on the point list

### [3] Point selection selection list

Selecting the points displayed on the list. Heat, change of rate and power measurements of the selected points will be displayed.

### [4] Event list

## Devices Tab

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List of points used in the project

Nr	Device type	Device Ser.No	Group	Marking	Serial No.	Calib Date	Calib No.	Sensor	Energy (process)	Alarms (process)	Energy (total)	Alarms (total)	Connected	Disconnected
A1	Ice Star ISC controller	C122			122/1	09.05.2014 13.08	122-122/2-1	TYPE_K	6.4627 kWh	0	6.4627 kWh	1	19.05.2014 10:11	-
A2	Ice Star ISC controller	C122			122/2	09.05.2014 13.08	122-122/2-2	TYPE_K	5.3345 kWh	0	5.3345 kWh	1	19.05.2014 10:11	-
A3	Ice Star ISC controller	C122			122/3	09.05.2014 13.08	122-122/2-3	TYPE_K	4.7881 kWh	0	4.7881 kWh	1	19.05.2014 10:11	-
A4	Ice Star ISC controller	C122			122/4	09.05.2014 13.08	122-122/2-4	TYPE_K	12.7858 kWh	0	12.7858 kWh	1	19.05.2014 10:11	-
A5	Ice Star ISC controller	C122			122/5	09.05.2014 13.08	122-122/2-5	TYPE_K	9.3611 kWh	0	9.3611 kWh	1	19.05.2014 10:11	-
A6	Ice Star ISC controller	C122			122/6	09.05.2014 13.08	122-122/2-6	TYPE_K	5.5855 kWh	0	5.5855 kWh	1	19.05.2014 10:11	-

### List's Columns

No	Point number
Device type	Device type
Device serial number	Serial number given for the device
Group	Named A-X. Z=All
Marking	Point's marking in this project
SNo	Device's serial number and the point's number in the device, Controllers: 1-8, Points according to the I/O configuration
Calib.date	Device's calibration date and time
Calib.No	Device's calibration certificate's number
Sensor	Sensor type
Energy	Energy used by the controller in the selected storage.
Alarms	The number of alarms in the selected storage
Energy total	Energy used by the controller in the project
Alarms total	Number of alarms in the project
Connected	Displays when the device has been connected to project
Disconnected	Not in use

## View

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 View

Reports and certificates may be printed for processes whose information has been stored. Printouts are entirely determined by the user, both the form (layout) and their content. The content of the printout consists of system fields, fields determined by the user as well as standard texts and images. The appearance of the printout is modified with colors, fonts etc. What the printout contains and what it looks like is determined by the text file (base model) that describes the certificate base. The ISPort program retrieves the bases to be used from the subdirectory "Layout" located in the root directory. The printing is done only from one stored process at a time. The process to be printed is selected from the "Recorded process" list.

### Tab's parts

#### [1] Base model

Selecting the printing model. In the list the first row of the model file will be used as the model label.

#### [2] Run set's label selection

The data entered by the user in the printout is retrieved from the pages of the tabs "Project data" and "Run data". The same field may appear on these pages multiple times and the content may vary. Fields 2, 3 and 4 define what information is used in the printout. The content of the field defined in the model is retrieved on the basis of the ID number in the following order:

1. From run data, (page according to the storage) [2]
2. From project data, from page two onwards [3]
3. From project data, from page one (project's basic information). [4]

If the field is found on the page and its content is not empty (empty field), the search is stopped and the found field will be used. By removing the selection from the run set [2] these fields will not be searched from the run data page. If the information is not found from any searched page, the field in the printout is left empty unless a default value has been given for it in the base.

#### [3] Selection of the "Project information" page

The project data page (2->) that you want to use in the printout is selected from the list. The fields are retrieved from the selected page, in which case only the values of the fields that are on the selected page will be printed. In the image the page that contains the printout's customer data is selected from the list. If you do not want to use any additional pages (2->), "---" is selected from the list.

#### [4] Project information (page 1)

The project data page is a special case and the information therein can always be used in connection with other page numbers. If the searched field has not previously been found from other pages, the field on page one may be used, if the selection named after the project label has been checked.

#### [5] Buttons

##### Page x/x

The printout may consist of a number of pages determined in the model. Only one page at a time is presented on the preview display [6]. The displayed page may be changed with this button.

##### Zoom xx

The scale of the preview display may be changed in order to make the examination easier.

#### [6] Preview

In the preview the printout is in its final form. The preview may be updated by changing or reselecting any of the above mentioned selections.

## Determining the printout's layout and content

Base model saved in the file determines the content and appearance of printouts. Each different printout has their own file, which will later on be called a model file. Model files are saved in text form in the "LayOut" directory. The file name must begin with letters "IST\_", and the file type must be .TXT, for example IST\_Model.TXT. When landing on the "Printing" tab the ISPort program opens all files that fulfill the above mentioned criteria, and adds their first rows on the list, from which the user selects the desired model. The printouts consist of fields that are placed on the pages. One row in the model file determines each field's location, size and content. Specification row must not be divided on more than one row, and the use of commas or semicolons is not permitted in it, except in particularly specified locations. Upper-case letters must always be used in its labels. Measures are used in many specifications, in which case their unit is 1 mm, unless otherwise indicated. For most specifications a model and a corresponding row has been presented in the model file. Labels used for the printout's formation:

### Determining the drawing objects

Font types used in the printout must always be determined before use. The determined type will later on be referred to with a number. The marking "Ind" is used of the number in the description of the instructions.

<b>CF</b>	<b>Font definition</b>	
Structure	CF,Ind,Type,Height,Width,Flags,  Type: Font name. Must be same as in PC font list Height : Height x0.1mm Width : Width x0.1mm, if default for select heght the - Flags : B=Bold, I=Italic, V=Vertical	
Example	CF,1,Arial,20,-,-, CF,10,Arial,50,-,-,B CF,11,Free 3 of 9 Extended,55,-,-,	Small (2mm) Arial-font Bigger and BOLD arial Barcode (Free 3 of 9 Extended)
<b>CB</b>	<b>Fill color (brush)</b>	
Structure	CB,Ind,Flags,R,G,B Flags : Not in use, always solid color (S) R: Red 0-255 G: Green 0-255 B: Blue 0-255	
Example	CB,5,-,240,240,240 CB,6,-,255,255,255 CB,7,-,0,0,0 CB,8,-,255,0,0	Light gray White Black Green
<b>CP</b>	<b>Line color</b>	
Structure	CP,Ind,Flags,R,G,B, Widht of the line 1-4 pix Flags : Not in use, always solid line R: Red 0-255 G: Green 0-255 B: Blue 0-255	
Example	CP,9,-,240,240,240,2 CP,10,-,255,255,255,2 CP,11,-,0,0,0,2 CP,12,-,255,0,0,2	Light grey line, line 2pix White Black Green

**Formatting**

<b>PS</b>	<b>Page size</b>
Structure	PS,Width,Height Width: Page width as mm Height: Page height as mm
Example	PS,210,296      A4 potret ; PS,296,210    A4 landscape
<b>PM</b>	<b>Margins</b>
Structure	PM,Left,Top,Right,Down Margins are used to locate the field Dimensions are in millimeters measured at the top left corner
Example	PM,10,10,200,270
<b>PH</b>	<b>Header width</b>
Structure	PH,Width, text indentation x, text indentation y Width: The default width of header in millimeters if the header is ocated on the left side of text. If the header is on top of the text, the width is defined in the text. This value is used only if the header start from the left margin.
Example	PH,30,3,3      Left side headers 30 mm, indentation 3 pix

*Indentation recommended when the widht of the line is more than 1 pix*

<b>PG</b>	<b>Settings for temperature and time</b>
Structure	PG,Flags Flags : C= Celsius, F= Fahrenheit, A=Date format: yyyy/mm/dd, E = Date format dd,mm,yyyy As default program settings are used
Example	PG,FA      Fahrenheit and date format päiväys yyyy/mm/dd
<b>PB</b>	<b>New page</b>
Structure	PB Starts a new page
<b>SO</b>	<b>Select graphics object (created earlier)</b>
Structure	SO,Header,Text,Flags Header: Ind = Number of the object to be used with header Text: Number of the object to be used with text Flags : D= Objects will be used as diagram scales. Header for vertical scale and text for horizontal (time) scale.
<b>SC</b>	<b>Set color</b>
Structure	SC,oR,oG,oB,tR,tG,tB oR: Header Red, oG: Header Green, oB: Header Blue tR: Text Red, rG: Text Green, tB: Texti Blue. All values 0-255.
Example	SC,0,0,0,0,0,0      Balck header and text ;    SC,0,255,0,255,0,0 Green header and red text

**Esimerkki**

```
CF,1,Arial,20,-,-,
CF,2,Arial,30,-,-,B
CF,3,Free 3 of 9 Extended,65,-,-,

CB,5,S,240,240,240
CB,6,S,255,255,255
CP,9,S,255,80,255

CF,10,Arial,15,-,-,
CF,11,Arial,15,-,V,

PS,210,296
PM,10,10,180,270

SO,1,2
SO,5,6
SC,0,128,0,0,0,0
PH,60
```

**File used with examples**

## Fields to be printed

All texts and graphics to be printed out are printed as fields, or rectangles, in specified coordinates on the page. At the beginning of each specification row of the field to be printed there is a standard part that defines the location and size of the field on that page. The coordinate part consists of four numbers and flag fields separated with commas. The structure of the coordinate part

### X,Y, Width, Height, Flags

#### X and Y:

The location of the field's left upper corner x 0.1mm. Instead of the number value the following letters may be used  
 M=Margin. X in the left margin and Y in the top margin.

S=Same. The coordinate is the same as in the previous field. If the X coordinate is the same, the field starts in lateral direction from the same location as the previous field. If Y is the same, the field is at the same height as the previous field.

--Continuation. The field starts from where the previous one ended. If X continues, the field is located on the right side of the previous one. If Y continues, the field is located below the previous one.

#### Width and height

Field's width and height mm. Instead of number values the following letters may be used

M=Margin. if Width = M, the field is so wide that it ends in the right margin. If Height=M, the field is so high that it ends in the bottom margin.

S=Same. Field's width and/or height is the same as the previous field's.

--Normal. The content determines the field's width or height. E.g. text's width and height, number of rows and number of characters

+nn=Absolute coordinate. The figure (nn) sets the field's ending point in the desired location. Field's height and/or width is set according to the starting point and the determined ending point. If the heading above has been defined a width that is greater than the width of the whole field, the heading's width will be the width of the entire field. If the heading text or field text does not fit on the space allocated for it, the text is cut off with three dots.

#### Flags

Additional settings that affect the field's formulation and content. The following flags may be used together or separately.

B	A frame is drawn around the field
F	Heading is printed on the left side of the text. If the heading width has not been determined separately with the PH,II setting, the heading uses the space required by the heading text from the field's width
U	Heading is printed above the text. The field's height grows at the heading text's height
K	Cutted. Different settings in some places

The following settings take effect only in real time printing

Y	The year is printed
D	The date is printed (Day and month)
T	Printing the clock time (hours minutes)
S	Printing the seconds
A	Printing the date in form year/month/day

The following settings affect the text fields

C the text	Using the barcode font which causes the program to add * signs at the beginning and the end of
R	Text field is justified to the right (otherwise left), does not concern standards fields
E	Text field is justified to the center, does not concern standard fields
e	Text field is justified to the center, standard fields

#### Heading

Text in the field's heading. When the field starts from left margin (M) and the heading is above the text, the PH setting determines the heading's width. Otherwise if the heading text starts with a number, that will be used as the heading's width. If there are no numbers in front of the heading, the heading's width is selected on the basis of the width of the text it contains.

***Later on in the instructions the coordinate part is abbreviated with [H].***

### Examples on adjusting the field's size

Field is a general term for all texts and graphics to be printed. The field consists of two parts, the heading and the content. The field's content may be text or graphics. The heading is a text that describes the field, and it can be placed on the left side of the content or above it. The font type and color of the heading and the text may be different. The space used by the heading and text may be determined, or the size and quantity of the text therein sets the size of the space. If needed, the heading or the text can also be left out from the field. In the following model file's rows the standard text field (TC) has been printed by using different determinations.

```
TC,M,M,-,-,FBR,Käytetään otsakkeen leveytenä PH=60 oletusta,Kentän leveyttä tai korkeutta ei määritelty
TC,10,-,-,-,FB,Otsakkeen leveyttä ei määritelty,Kentän leveyttä tai korkeutta ei määritelty
TC,10,-,-,-,FB,50Otsakkeen leveys 50,Kentän leveyttä tai korkeutta ei määritelty
TC,10,-,120,-,FB,Otsakkeen leveyttä ei määritelty,Kokonaisleveys 120
TC,10,-,120,-,FB,50Otsakkeen leveys 50,Kokonaisleveys 120
TC,S,-,S,-,FB,Otsakkeen leveyttä ei määritelty,Kokonaisleveys sama kuin edellisellä
```

```
TC,M,-,-,-,UB,Otsakkeen leveyttä ei määritelty (Otsake ylhäällä),Leveyttä ei määritelty
TC,M,-,100,-,UB,Otsakkeen leveyttä ei määritelty (Otsake ylhäällä),Kokonaisleveys 100
TC,M,-,100,-,UB,Otsakkeen leveyttä ei määritelty (Otsake ylhäällä),Kokonaisleveys 100
Korkeutta ei määritelty,Korkeus määräytyy automaattisesti
TC,M,-,100,S,UB,Otsakkeen leveyttä ei määritelty (Otsake ylhäällä),Kokonaisleveys 100 Korkeus sama kuin edellä
TC,M,-,100,15,UB,Otsakkeen leveyttä ei määritelty (Otsake ylhäällä),Kokonaisleveys 100 Korkeus 15
```

Käytetään otsakkeen leveyttä PH=60 oletusta	Kentän leveyttä tai korkeutta ei määritelty
Otsakkeen leveyttä ei määritelty	Kentän leveyttä tai korkeutta ei määritelty
Otsakkeen leveys 50	Kentän leveyttä tai korkeutta ei määritelty
Otsakkeen leveyttä ei määritelty	Kokonaisleveys 120
Otsakkeen leveys 50	Kokonaisleveys 120
Otsakkeen leveyttä ei määritelty	Kokonaisleveys sama kuin edellisellä
Otsakkeen leveyttä ei määritelty (Otsake ylhäällä)	Leveyttä ei määritelty
Otsakkeen leveyttä ei määritelty (Otsake ylhäällä)	Kokonaisleveys 100
Otsakkeen leveyttä ei määritelty (Otsake ylhäällä)	Kokonaisleveys 100 Korkeutta ei määritelty
Otsakkeen leveyttä ei määritelty (Otsake ylhäällä)	Korkeus määräytyy automaattisesti
Otsakkeen leveyttä ei määritelty (Otsake ylhäällä)	Kokonaisleveys 100 Korkeus sama kuin edellä
Otsakkeen leveyttä ei määritelty (Otsake ylhäällä)	Kokonaisleveys 100 Korkeus 15

### Examples of field placement

```
TC,M,80,-,-,UB,X = Laidassa,Y = 60
TC,-,-,-,-,UB,Edellisen oikealla,Edellisen alapuolella
TC,S,-,-,-,UB,X = Sama,Edellisen alapuolella
TC,-,S,-,-,UB,Edellisen oikealla,Y = Sama
```



## Examples on using the formatting flags

With the help of the flags the text's location in the text field and the heading's location are determined and the text field's text is modified. Fields are printed out in the same order as they are in the model file. The fields may be printed one upon the other, in which case the latter field is printed upon the previous one. Headings are printed so that they cover the fields and text underneath. Text parts of the fields are printed on the fields underneath by using a transparent text background. Fields may for instance be gathered in groups by first printing out the frames, and then the fields upon the frame. Text fields (TF), standard text fields (TC) and the printing's real time have been printed in the examples by using different flag settings.

```

TF,M,M,150,-,FBR,Tässä kentässä teksti on oikeassa laidassa Liput=FBR,367,-,-
TF,M,-,S,-,FBE,Tässä kentässä teksti on keskellä Liput=FBE,367,-,-

SO,1,3 ! Barcode tekstiin
TF,M,-,S,10,FBE,Tässä kentässä käytetty barcode fonttia (3) Liput=FBEC,368,-,-
SO,1,2 ! isot merkit

VT,10,30,-,-,BFYDTS,Reaaliaika Liput=BFYDTS
VT,-,S,-,-,BFDTS,Liput=BFDTS
VT,-,S,-,-,BFTS,Liput=BFTS
VT,-,S,-,-,BFT,Liput=BFT
VT,10,-,-,-,BFYDA,Liput=BFYDA

VP,10,40,-,-,F,Sivunumero
TC,M,-,50,20,UB,Vakiotekstin käyttö ryhmittelyyn,Seuraavat rivit\ tulostuvat kentän päälle
TC,-,S,S,S,B,Ilman otsaketta näkyy vain karmit,Seuraavat rivit tulostuvat kentän päälle
TC,-,S,M,S,B,Ilman otsaketta näkyy vain karmit,
TC,M,-,50,10,FB,50,
TC,-,S,50,10,FB,25,
TC,-,S,M,10,UB, ,
    
```

Testikenttä tiedot	
Testikenttä tiedot	
	
Reaaliaika Liput=BFYDTS 22.01.2012 18:28:43   BFDTS 22.01.2012 18:28:43   BFTS 22.01.2012 18:28:43   BFT 22.01.2012 18:28:43	
Sivunumero 2/4	
Seuraavat rivit tulostuvat kentän päälle	Seuraavat rivit tulostuvat kentän päälle



**Text fields**

<b>TC</b>	<b>Constant text field</b>
Structure	TC,[H],Text
<b>TF</b>	<b>Text field</b>
Structure	TF,[H],Id,Run no,Page,Options Id: Field ID Run no: If data is retrieved from other than default capture else '-' Page: If data is retrieved from other than default page else '-' Optio-osan merkitys muuttuu kentän tyyppin mukaan seuraavasti:
• Table	Options : -;NNColumn1;Column2;...No more than 20 columns NN: Width of column as mm, otherwise the column width is defined by character count
• Check	Options: Header;No;Yes Ei: Text when checkmark On: Text when no checkmark
• List	Options: Header,Line1;Line2;Line3;...
• Other types	Options: Default text
<b>VP</b>	<b>Page number</b>
Structure	Text : page no and total count of pages xx/xx VP,[H]
<b>VT</b>	<b>Print time</b>
Structure	Formatting flags defines how real time is printed. VT,[H]

**Examples on different field types**

Information required for printing out the standard field is given in the base model, the data saved in the project is not used. In other fields either the data saved by system or the data given by the user is used. The field's content is retrieved from the project data on the basis of the ID given on the model base's row. In addition to the above mentioned settings, the field's printing method depends also on the field's type. Tables, checks and selection lists require that texts have been determined for all possible selections in the model base in the so-called model list. The model list's texts have been separated from each other with semicolons. The text of the selection lists is retrieved from the model list from the same location (index) as the selection is in the field's specification data. The first text of the model list is used as the check's text if the check is not selected, otherwise some other. The column names of the tables are listed in the model list and provided with the possible desired column width.

```
TF,M,M,-,-,F,Järjestelmä kenttä Liput=F (Ajo aloitettu (80),80,-,-
TF,-,S,-,-,FB,Järjestelmä kenttä Liput=FB Ajoaika (102),102,-,-
TF,M,-,-,-,FB,Käyttäjän lisäämä tekstikenttä Asiakas (342),342,-,-
```

```
TF,M,-,-,-,BF,Tämä ei näy,353,-,-,Merkattu tieto (Ruksi) Täyttääkö vaatimukset (kenttä 353);Ei
Täytä;Täyttää
```

```
TF,M,-,150,-,-,BF,Ei näy,356,-,-,Valinta lista (356) Lämmitysmenetelmä;Siirrettävä
virtalähde;Sähköuuni;Kaasu-uuni
```

```
TF,M,-,M,-,-,BU,Taulukko 6 saraketta ja 2 riviä,350,-,-,Tämä ei näy Käytetään
otsaketta;15Nro;50Piirustusnro;25Laitte;25Kone;10Kpl;20Vara
```

Järjestelmä kenttä Liput=F (Ajo aloitettu (80))		18.01.2012 16:24:46		Järjestelmä kenttä Liput=FB Ajoaika (102) 40m 40s	
Käyttäjän lisäämä tekstikenttä Asiakas (342)		Asiakas			
Merkattu tieto (Ruksi) Täyttääkö vaatimukset (kenttä 353)		Ei Täysi			
Valinta lista (356) Lämmitysmenetelmä Kaasu-uuni					
Taulukko 6 saraketta ja 2 riviä					
Nro	Piirustusno	Laitte	Kone	Kpl	Vara
Osaero rivi 1	Piirustusnumero rivi 1	Laitte rivi 1	Kone rivi 1	Kpl rivi 1	V.Rivi 1
Osaero rivi 2	Piirustusnumero rivi 2	Laitte rivi 2	Kone rivi 2	Kpl rivi 2	V.Rivi 2

**System tables**

**TK**  
Structure

**Device list**  
TK,[H],Rivi No;Point type;Device ID;Used ID;  
Ser No user;Ser No;Kalib Date;Kalib No;Sensor type  
Column headers separated by ';'.

Column is not printed if its column header is '-'  
Optional header width can be put before column header text (mm)

**TL**  
Structure

**Point list**  
TL,[H],Point no;Label;Label;Label  
Ser No/Point No;Sensor type;Connected;-;Offset;Energy

Column is not printed if its column header is '-'  
Optional header width can be put before column header text (mm)

**Note!**

**Extra settings: When first Label marked with 1 = Measurement points are situated under each other**  
**Extra flag: K cuts everything else than nro. and description of points**

**TM**  
Structure

**Phase list**  
TM,[H] or Tm,(H)

**Note!**

**Extra flag: K cuts (min-max) away from phase list**

**Note!**

**In Part list extra flag little L-letter (l) makes scale under the list. Scale line can be defined with CP comment in Drawing objects.**

**Examples on using the system tables**

The system tables are printed in the same manner as the tables defined by the user. The only difference is that the system's tables have not been determined a height (number of rows), but it varies according to the situation. The columns of the system tables are fixedly determined and their order cannot be changed. In the model data the columns are given names and widths and at the same time it may be defined whether the column is displayed at all. The phase list is different by its structure and it does not have actual columns.

```
TK,M,60,M,-,BU,Laiteluettelo;8Nro;20Tyyppi;-;-;10SNro;-;15Kalib Pvm;15Kalib.Nro;10Anturi
```

```
TL,M,-,M,-,BU,Pisteluetelo;8Nro (1);20Tyyppi (2);10Tunnus (3);10Tunnus (4);20Kuvaus (5);10SNro/PN (6);10Anturi (7);10Liitetty (8);0Iroitettu (9);8Offset (10);6kWh (11)
```

```
TM,M,-,M,-,UB,Vaiheluettelo
```

Laiteluettelo										
Nro	Tyyppi	SNro	Kalib Pvm	Kalib Nro	Anturi					
1	Ice Star ISC controller		-		K TYPE					
Pisteluetelo										
Nro (1)	Tyyppi (2)	Tunnus (3)	Tunnus (4)	Kuvaus (5)	SNro/PN (6)	Anturi (7)	Liitetty (8)	Iroitettu (9)	Offset (10) kWh (...)	
1		S85-1	S85-1	S85-1	CB5/1	K TYPE	-	-	+0	25.479
Vaiheluettelo										
Nopea nodot				Hidas nodot			2			
6 Nodot 250°C/h		27 > 60°C (247°C/h)		12 Nodot 50°C/h		60 > 70°C (43°C/h)		22 Lasku 100°C/h		69 > 49°C (-99°C/h)
				14 Pitäjä		60-80°C 26m				
				18 Pito 70°C		70°C (69-70°C) 2m 12s				

## Graphics

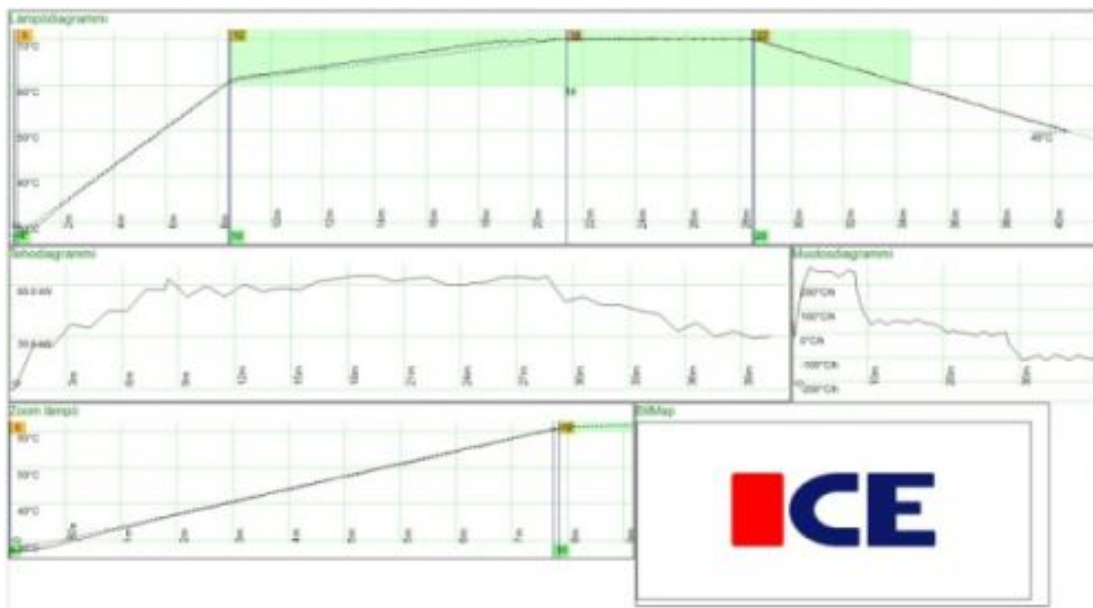
<b>TO</b> Structure	<b>Bitmap</b> TO,[H],File File: File name in "Layout"-directory. No .BMP-extension
<b>GH</b> Structure	<b>Temperature diagram</b> GH,[H]
<b>GP</b> Structure	If more diagrams in the same document, the time scale is divided by the count. <b>Power diagram</b> GP,[H]
<b>GR</b> Structure	If more diagrams in the same document, the time scale is divided by the count. <b>Rate of change diagram</b> GR,[H] If more diagrams in the same document, the time scale is divided by the count.
<b>GZ</b> Structure	<b>Zoom-diagram</b> GZ,[H],Type Type: H=temperature diagram, P=power diagram,R=rate of change diagram

## Examples on using the graphics fields

Instead of text, the content of these fields is graphics, otherwise the fields are used in the same manner. Diagrams may be divided into a number of parts by placing the same type of diagram in the base model multiple times. The diagram's scale texts are selected in use with the selection row's (SO) option D. The first index is selected as the vertical scale's text and the latter on the horizontal scale. The scales are selected automatically and the user cannot influence them. The images must be in the "Layout" directory as bit maps (.BMP), and their file names are given in the base model without the ".bmp" suffix. The program does not scale the bit maps, which is why they must be adjusted with a graphics software so that they fit the space

SO,10,11,D ! pienet merkit

```
GH,M,M,M,30,BU,Lämpödiagrammi
GP,M,-,100,20,BU,Tehodiagrammi
GR,-,S,M,20,BU,Muutosdiagrammi
GZ,M,-,80,20,BU,Zoom lämpö,H
TO,-,S,53,26,BU-,BitMap,IceLogo
```



## Using the templates

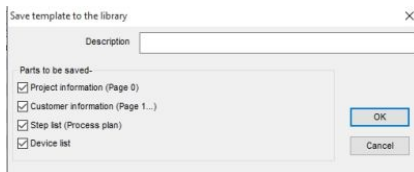
Templates
 Save template
 Load template

Often, or almost always, the same information or at least the same types of fields are used in the projects. The same fields are added to the project's basic data, run data and customer data in each project. The use of the model base efficiently cuts down the need to re-add fields as well as enter data. Once used project can automatically be saved in the model library, from which it is read to use either partially or entirely. When storing to the library, all project pages, fields and their content are stored. When the saved project is utilized in the next project, only a part of it may be used. Bases have been stored in the file DEFPROJECT.TB1 that is located in the root directory.

## Save Template

Save template

An active project is stored in the library, i.e. its row on the project list is emphasized and the project is open in the document window. When the project is selected, the button bar's "Save" button is pressed.



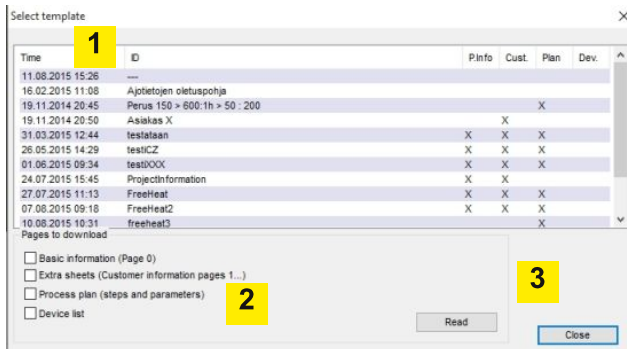
### Description

It is advisable to write a proper description for the data within the project in order to be able to find the correct information from the library later on. The project does not need to be run or otherwise perfect when storing. The most important thing is that the information needed for storage has been added and possible filled with default values. The project may be entirely temporary and it may be removed after the storage. The use of bases is usually easier if only part of the whole project's data has been stored in them, e.g. data of one customer.

## Load Template

Load template

The project may be formatted at once or in parts, as many times as is needed. It must be noted, however, that some of the data is overwritten with the formatted data, which is why it is recommended to perform the formatting prior to adding fields or their data to the project



[1]

List of saved projects in the library. One line at time is selected from the list by clicking with mouse.

[2]

Projects may be formatted in parts. What parts are read from the model base is set as follows:

### Data pages

Pages on the project's "project data" tab and their fields. The read pages are added to the project, in which case the pages can be read from several library bases. If the pages have been stored in the library so that their fields have already been filled in, the content of the fields is also read.

### Process plan

The process instructions to be read overwrite the possibly existing process instructions. At the same time the process's set values and the settings in the "Additional settings of the project" dialogue will be read.

### Device list

Reading the project's point list. The point list must be empty before reading the points. The points may be controllers or test points.

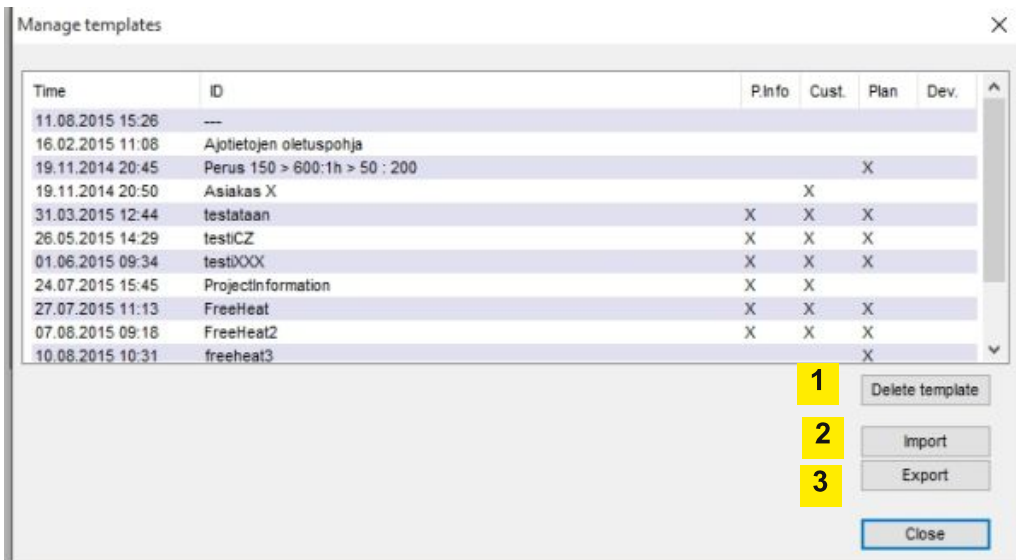
[3]

With the "Read" button the marked parts [2] from the base [1] selected from the list are read. After the reading the dialogue remains open for the purpose of possible reading of other parts. Selections [2] are undone after the reading. When the necessary parts have been read, the dialogue is closed from the "Close" button.

If there is a base in the library that is no more needed, it can be removed with the "Delete the base" button.

## Templates

Templates 1



### [1] Delete template

Delete chosen template.

### [2] Import

Import templates from other files or ex. from flash drive. Press "Import" and seek directory, that you want to import to current ISPort. ISPort does not overwrite old templates, just adds the imported templates to the list.

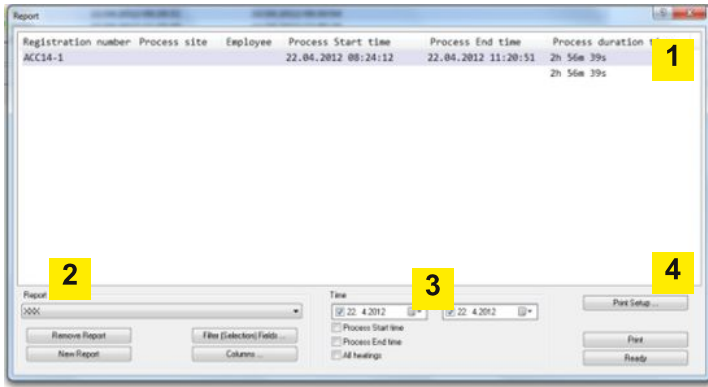
### [3] Export

Export templates from current ISPort to an other directory or ex. flash drive. Choose wanted templates and press "Export". Save templates with a filename to wanted directory.

## Reports

Information may be collected about the finished projects, and summaries (i.e. reports) may be printed about them. The projects to be reported must not be active (in use) and they must be located in the "Archive" directory. For each different report the system creates its own report base, which the program stores in the "Raportti.tab" file. The reports contain information about the projects that meet the given selection criteria. The criteria are the data in the determined fields and the process's execution moment (run time). From the selected projects, information is gathered from the desired field to the columns, and if the field values can be combined, the total values are summed in the columns. The table generated thereby can also be printed if needed.

The use of reports is started by opening the "Report" dialogue with the "Reports" button.



**[1]List (Reporti)**

All the projects that are in the report are listed in the list. If the project has been run multiple times, each run may have their own row. Only the width of the columns may be adjusted, otherwise nothing can be selected from this list. The last one is the summary row to which values of all columns to be summed have been added up.

**[2] Report**

On the top of the section there is a selection list from which the report base to be used is selected. Bases in the list may be used, modified or deleted. The report base to be used is selected from the list. The report is formed automatically in the list [1] on the basis of the used base. The creation of a new report base is started with the button "New report". The fields shown in the report are selected with the dialogue that opens with the "Columns..." button. Each selected field forms one column in the report. What projects and run sets are selected to the report, is determined in the dialogue that opens with the "Selection fields" button. Further information about the dialogues that open with the buttons can be found on the next page.

**[3] Time**

Projects to be included in the report may be limited also according to the point of time. Either the starting or finishing time, or both, are used as the run moment. The period of time during which the process must be completed is set with two calendar days. The first calendar determines the first day on which or after which the run has been completed. The latter calendar, on the other hand, determines the last day. The calendar is enabled by selecting its corresponding selection box (X). If the first calendar day is selected and the second one does not exist, all processes that have been run on the set day or after that are involved in the selection. Likewise, with the latter calendar the processes that have been completed after the selected calendar day can be left out. With the "Starting time of the run" and "Finishing time of the run" selections the process's point that has to be within the selected time range is set. The project's actual selection fields are checked only after the process fulfills the selected time criteria. With the selection "All runs" all projects that fulfill the time criteria and their processes, i.e. run sets, are added to the process.

**[4] Printing settings, Print, Done**

The report is printed out by pressing the "print" button. The dialogue is closed with the "Done" button and the changes made in the reports are saved automatically.

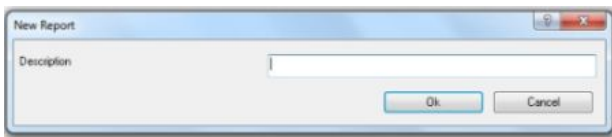
The font type and the margins of the printing are set in the dialogue that opens with the "Printing settings" button:



**The Font and the color are chosen by clicking "Change" button**

**Margins are in millimeters**

## Creating a new report



**Description is used as the header on the printed report**

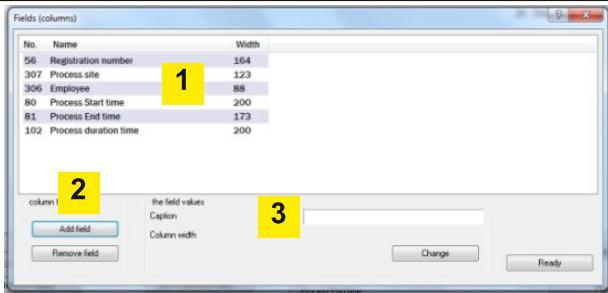
## Column selection



Fields determined by the system or the user may be used as the columns to be displayed in the report. The data in the fields is retrieved from the project by using the field's ID number, in the following order:

- 1 Run data
- 2 Project data pages 2...
- 3 project data page 1

When the searched field is found and it is not empty, the found data is used and the field will not be searched from elsewhere in the project.



*Fields are printed as columns in the report in the same order as they are on the list. The location of the field may be changed by dragging with the mouse.*

#### [1] List

List of selected fields. One column of each field is printed in the report. Also the proportional width of the column is shown on the list, which can be changed by changing the width of the report's column (with mouse).

#### [2] Add a field, Delete a field

"Add field" button opens the dialogue from which the field to be added is selected.

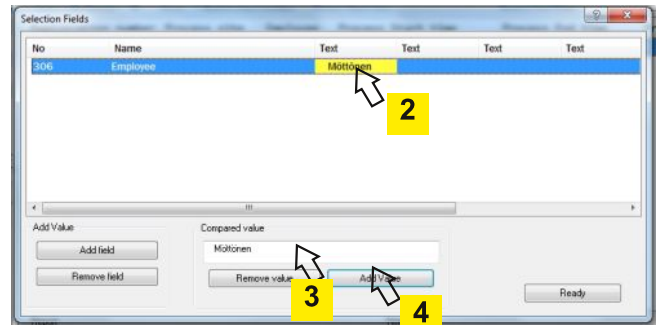
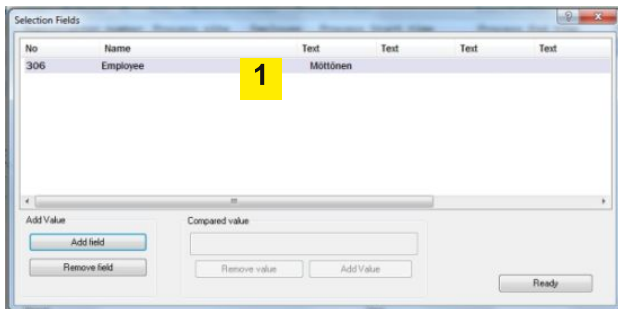
"Remove field" button removes the field that is selected on the list.

#### [3] Field values

By default, the column's label or name is the same as that of the selected field. If you wish to change the field's label, the field is selected from the list, the label is changed and the "Change" button is pressed.

## Selection fields

With the help of the selection fields and time selection, the projects and their stored run sets are selected to the report. The selection field's value and the value of the project's corresponding field (text) must be the same before it is added to the project. If none of the selection fields have been determined, the project is selected to the project merely on the basis of the execution time. All conditions are of the OR-type, i.e. it is enough if one condition is fulfilled. The same field may be given more than one alternative value that the project's field shall be. Field comparison is only done in text form, number or other numerical value fields are not allowed.



### Adding a selection field

#### [1] Selection field list

Selection field is added to the list by opening the "Select a field" dialogue with the "Add a field" button, and by selecting the field to be added from the list (type=1 (Text)). In the image the field 306, i.e. the "employee", is selected. It is sufficient if one of the list's field is TRUE:

### Adding, changing and removing the reference value

#### [2]

A new value is given for the field, and it must be in the corresponding project field in order to add the project to the report. The selection field row is clicked on the column to which you want to add the selection value, or whose value you want to change. All columns of the row are of equal value.

#### [3]

Entering a new value or changing the old value by writing a text required for the selection in the box.

#### [4]

Accepting the addition or change with the "Add a value" button.

The selection value is removed by clicking the value on the list and pressing the "Remove the value" button.

More alternative values for the field may be given by repeating the same phases at the second "Text" column.