



EDTE

**VTU Software
User Manual**

Version 005

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The EDTE Software

1

Although the Eurotherm controller may be operated manually it is far easier to use the TopSpin software. This enables the value of various parameters, in particular the target temperature, to be set.

For routine use only, the following two operations are regularly carried out :

1. A self-tune is performed.
2. The target temperature is set.

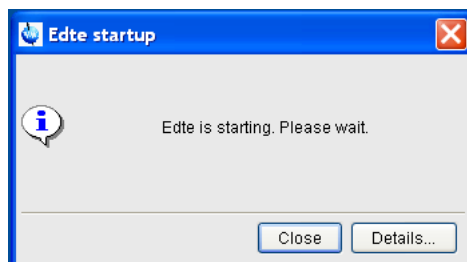
Both operations are most easily carried out using the software.

Starting Edte

1.1

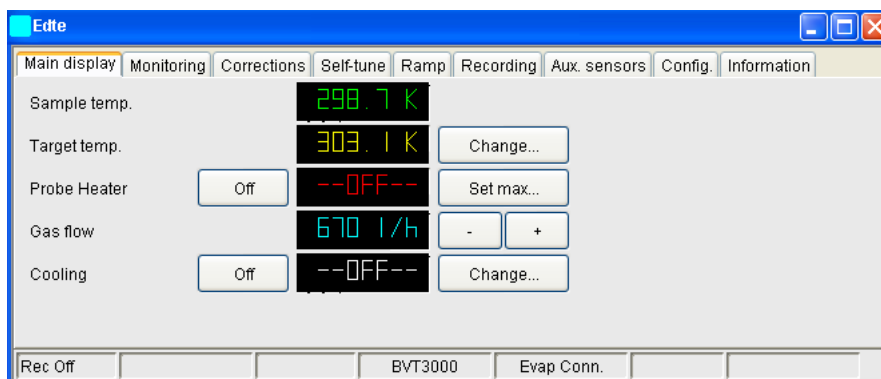
To start the Edte Graphical User Interface, enter **edte** in the **TopSpin** command line. A first window appears, indicating that the program is initializing:

Figure 1.1. Edte Splash Screen



After a few seconds, this window disappears and the Main Window is displayed. It may have different aspects regarding to the connected temperature unit. With a BDTc, BVT3000, or BVT3300, the main window looks like this:

Figure 1.2. Edte Main Window



The Edte window

1.2

Unlike XwinNmr, where Edte was an external window, the Edte window is included in TopSpin.

It is divided in three parts:

- the tab bar
- the display area
- the status bar

The tab bar contains 9 tabs:

- Main display
- Monitoring
- Corrections
- Self-tune
- Ramp
- Recording
- Aux. Sensors
- Config.
- Information

The display area changes according to the selected tab.

Main Display Tab

1.3

The main display contains the most important information coming from the temperature unit:

- Sensor temperature
- Target temperature
- Heater power / state

- Gas flow level / state
- Cooling power / state

and several buttons to setup and activate various temperature unit functions:

- Setting target temp
- Start / stop heating
- Setting max power
- Increase / decrease gas flow level
- Start / stop cooling
- Setting cooling power.

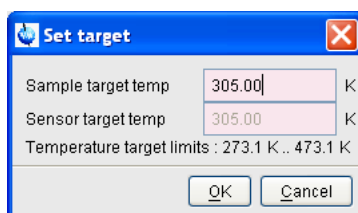
Changing the target temp

1.3.1

To change the target temp, click the **Change...** button near the **Target temp.** value (the yellow one).

The following window will appear:

Figure 1.3. Set target window



Enter in the **Sample target temp** field, the desired temperature. If temperature correction is used, a new value will be calculated in the **Sensor target temp** field. This value will be applied.

The temperature target limits setup in the **Config.** tab are displayed for information. It is not possible to enter a target temperature out of this range.

Starting / Stopping heating

1.3.2

To start / stop heating, click the button at the left of the output power value (the red one). Its label will switch from **Off** to **On**.

When the heater is on, the applied output power is displayed in the red label near the On/Off button.

If the power is switched off due to missing gas flow or any other security reason, the label will switch to Off without user interaction.

If there is overheating, the output power will contain a blinking **OVERHEAT** error message.

Changing the Max Output Power

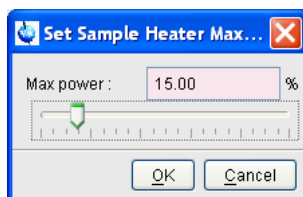
1.3.3

To change the High Power Limit, click the **Set Max...** button, or use the right mouse button, on the output power label.

The right mouse will display values in a list in 5% steps. Select a value.

In the **Set Sample Heater Max Power** window, use the scale bar, or enter the value in the text box. Apply the changes and close the window.

Figure 1.4. Set Sample Heater Max Power



Changing the gas flow

1.3.4

To change the gas flow, use the **+** or **-** button. Another possibility is to click with the right mouse button on the displayed value. A list of 16 values will appear. Just select the desired gas flow.

If there is no gas flow, the blinking **MISSING** error message will appear instead of the gas flow level.

Starting / Stopping cooling

1.3.5

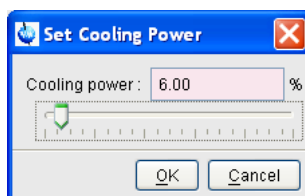
Same as for Heating.

Changing the cooling power

1.3.6

Same as for Heating.

Figure 1.5. Set Cooling Power



The cooling display is also used to report the LN₂ level.

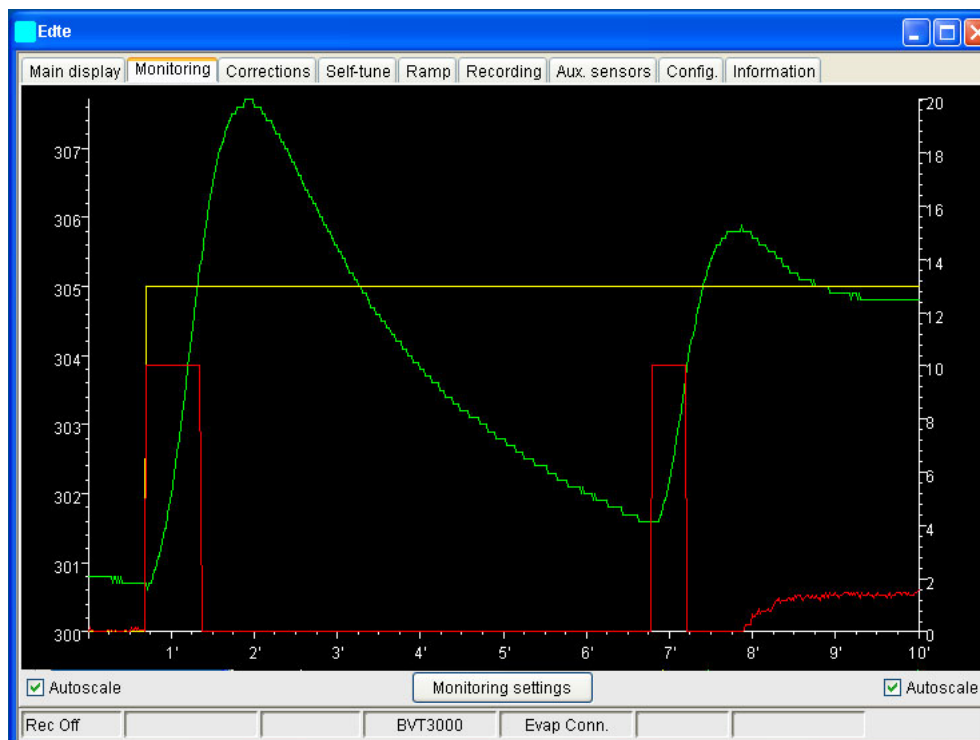
Instead of the cooling power, a **REFILL** or **EMPTY** message may be displayed.

Monitoring Tab

1.4

This tab displays a graphical tool that shows the evolution of sample temp, target temp and output power in the 2 last minutes. One point is taken every second. This default setting can be modified with the **Monitoring settings** button.

Figure 1.6. Monitoring Tab



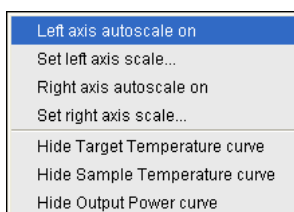
Defining the left or right axis scaling

1.4.1

Edte calculates automatically the left and right scaling to display user friendly axis values.

By pressing the right mouse button in the curve area, a popup menu is displayed, where you can change this behavior.

Figure 1.7. Autoscale axis



You can define here the characteristics of the right and left axis (setting autoscale on or defining manually the scale min and max values).

Figure 1.8. Left and Right Axis settings



You can also access the left or right axis settings by double-clicking in the left or right axis area.

To go back to automatic scale, click the toggle button **AutoScale** in the dialog window or in the monitoring panel below the left and right axis.

Showing / hiding a curve

1.4.2

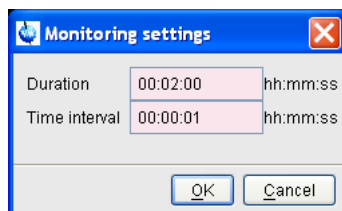
In this popup menu, you can show or hide the curves.

Monitor settings

1.4.3

This menu displays a window for setting the monitor parameters.

Figure 1.9. Monitoring settings



Set the Monitor duration using the hh:mm:ss or HHh MMm SSs format (00:10:00 or 10m).

Time Interval defines the interval between two temperature acquisitions.

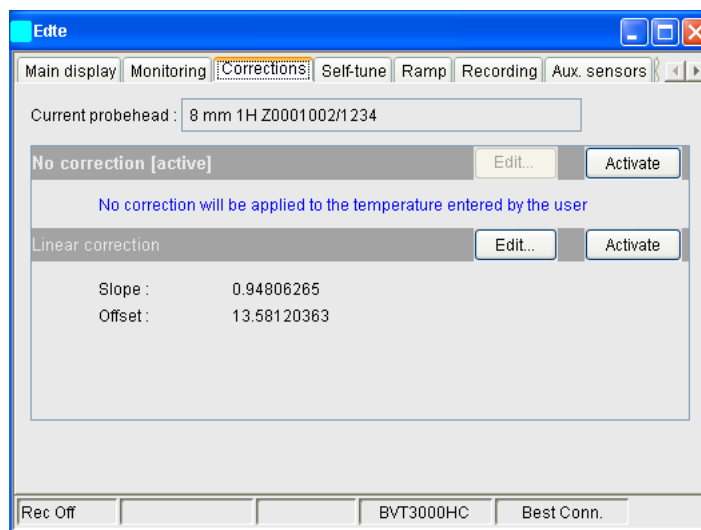
Corrections Tab

1.5

The temperature sensor located in the probehead does not measure the sample temperature. We may have a difference between the sample temperature and the temperature measured just below the sample.

Corrections have been introduced to handle these temperature differences.

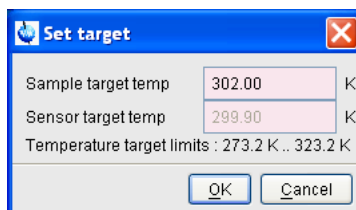
Figure 1.10. Corrections Tab



The temperature controller will be programmed with a corrected target temperature according to the entered correction parameters, and the temperature displayed in Edte is recalculated. The values displayed by Edte and the Eurotherm controller differ when a correction is active.

When setting the sample target temperature, the **Set Target** window will apply the correction and display the computed value in the **Sensor target temp** text field.

Figure 1.11. Target setting



No correction

1.5.1

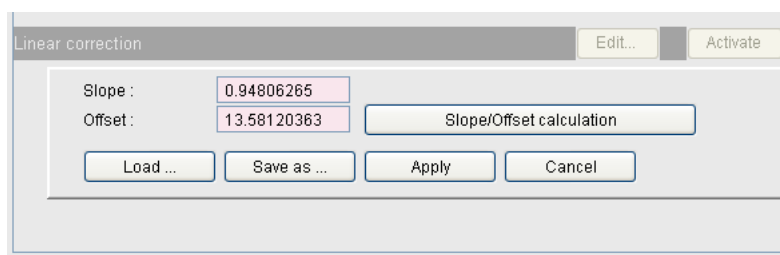
No correction is applied to the temperature entered by the operator. In the Correction panel, click the **Activate** button of the **No Correction** line to disable any correction.

Linear Correction

1.5.2

To define a linear correction, click the **Edit...** button of the **Linear correction** line.

Figure 1.12. Linear correction



You will have to define the **Slope** and **Offset** values. The easiest way is to use the **Slope/Offset calculation** button.

The obtained values can be saved to a file and loaded using the **Save as...** or **Load...** buttons.

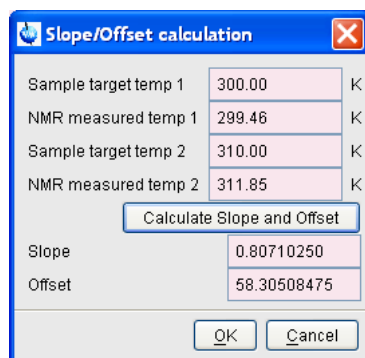
Once you have defined the slope and offset values, **Apply** and **Activate** the Linear Correction. The **Corr. Active** information is displayed in the status bar.

Slope/Offset calculation

1.5.3

To calculate the slope and offset values you will need to measure the "real" sample temperature using NMR methods for two different Eurotherm Target temperatures. In the following example, we have measured the sample temperature at 300K and 310K (see also **"Bruker Adjustment Temperature Management" on page 29**).

Figure 1.13. Slope/Offset calculation



The **Calculate Slope and Offset** button automatically computes the correction parameters.

Self-tune Tab

1.6

Whenever a significant change in the operating conditions are made (Gas flow, target temperature, probehead, aso.), a self-tune should be carried out.

Figure 1.14. Self tune window

To perform a self-tune, just enter the **Self-Tune target temp**, and the **max output power**. Click the **Start self-tune** button to begin the process.

You can manually change the Proportional Band, Integral and Derivative Time values and apply with the **Apply PID changes** button.

The **Reload PID values** button will get the original Proportional Band, Integral and Derivative time values from the temperature unit.

When the self-tune is finished the new Proportional, Integral and Derivative values are loaded (see ["What is a self-tune" on page 21](#)).

Set cutback

1.6.1

Overshoot and undershoot can be eliminated by the correct setting of cutback low and cutback high.

While the PID parameters are optimised for steady state control at or near the set-point, high and low cutback parameters are used to reduce overshoot and undershoot for large step changes in temperature. They respectively set the number of degrees above and below setpoint at which the controller will start to decrease or cutback the output power.

Figure 1.15. Set cutback window

The values are automatically set when a self-tune is performed.

This toggle button allows to switch from a fixed P.I.D. based regulation to a adaptive tune regulation. This feature will overwrite the parameters Proportional, Integral and Derivative when a disturbance indicates that they are incorrect.

In ramp mode, the setpoint ramps linearly, from its current value to a new value as a set rate (called ramp-rate programming).

You have to specify the ramp rate, and the target set point.

A controller has several states:

- Reset: In reset the controller behaves as a standard controller (PID mode).
- Run: the controller varies the set point according to the ramp rate, current value and target temp.
- Hold: the program is frozen at its current point (not available with all controllers).
- Holdback: Indicates that the measured value is deviating from the ramp set point by more than a pre-set amount and that the program is in Hold, waiting for the process to catch up. Ramp Holdback is not available for all controllers.

In the Ramp panel, you can define the temperature to reach and the speed.

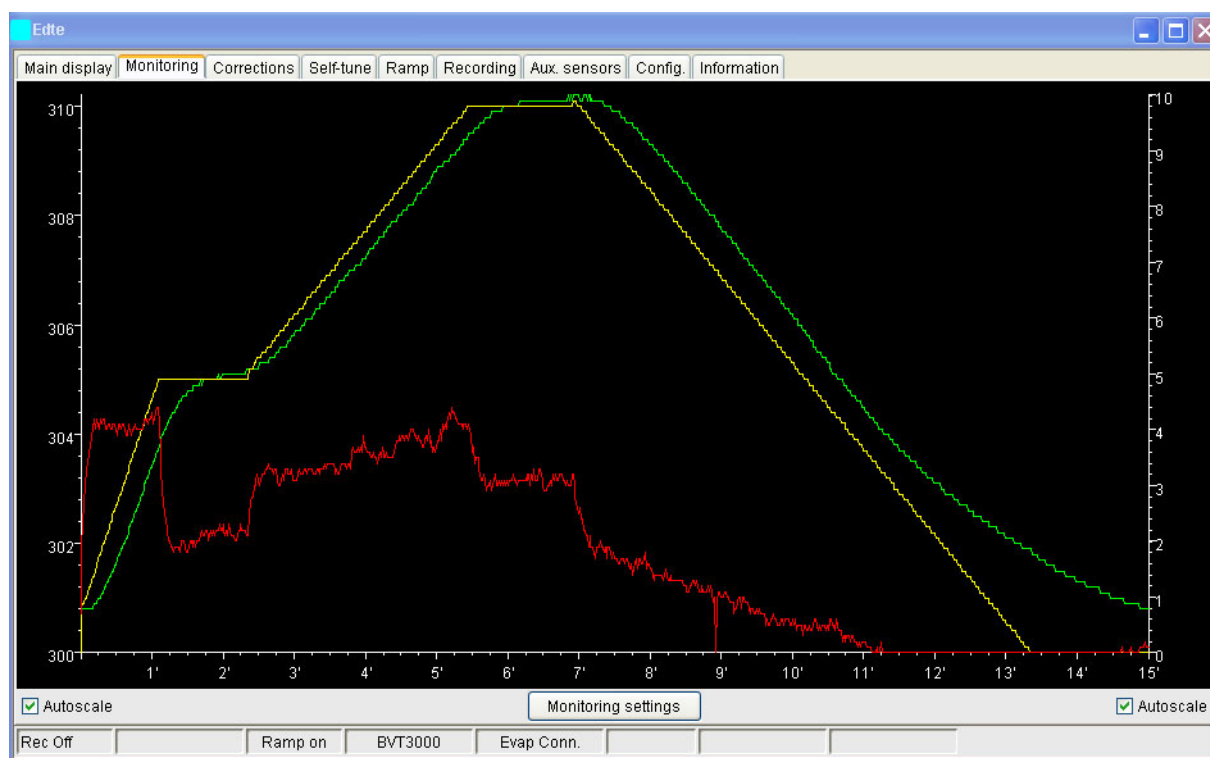
Figure 1.16. Ramp panel window



The **Run** button starts the ramp. The **Reset** button stops the ramps (switch to P.I.D. mode). The status bar displays the remaining time. While the ramp is running, the operator may change the target by entering a new value in the ramp panel or in the main display.

When ramps are activated, the target temperature displayed in the main display panel switches from the **Ramp Target Temp.** to the current set point. **Ramp on** is also displayed in the status bar.

Figure 1.17. Ramp monitor



The Monitor panel displays a 3 segment ramp with different Ramps rates.

Eurotherm 2416 ramps

1.7.1

For all temperature Units with Eurotherm 2416, the Ramp panel is a little bit different:

Figure 1.18. Ramp Eurotherm 2416

Ramp Target Temp :	<input type="text" value="302.00"/>
Ramp rate (degree/min) :	<input type="text" value="0.50"/>
Ramp Holdback (degree) :	<input type="text" value="1.00"/>
Ramp is running	
<input type="button" value="PID mode"/>	<input type="button" value="Activate"/>
<input type="button" value="Apply changes"/>	

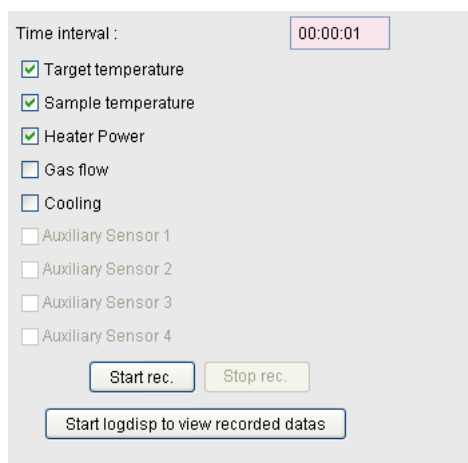
As the set point ramps up or down, the measured value may lag behind, or deviate from the set point by an undesirable amount. Holdback is available to freeze the program at its current state, should this occur. When the error comes within the holdback value, the program will resume normal running.

The **PID Mode** button stops the ramp. **Activate** will start the ramp. If any ramp parameter has been changed, the new values must be applied with the **Apply changes** button.

Recording allows to store in an ASCII file, several parameter values concerning the temperature unit at a given time interval.

The recording status is displayed in the status bar of Edte.

Figure 1.19. Status bar of Edte



You just have to set the time interval between two points, and the parameters you want to record.

Time Interval can be entered using the HH :MM :SS or HHh MMm SSs format.

The files are located in the **prog/logfiles** directory. In the first releases of TopSpin, the recording directory was **exp/stan/nmr/obsd**.

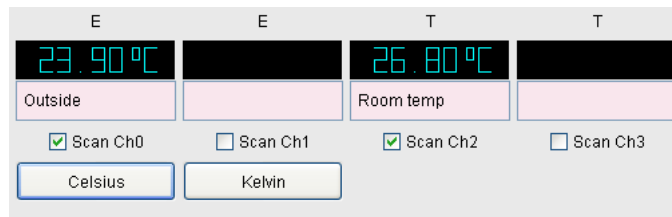
The name of the recording file is automatically generated by Edte in the form of **vtulog_YYMMDD.txt**.

The logdisp displays previously recorded files. You can type **logdisp** in the TopSpin command line or click on the **Start logdisp to view recorded datas** button in the Recording tab of Edte.

A new window will be opened, and you will be asked to select a file to display.

This panel displays up to four additional temperatures:

Figure 1.20. Panel with auxiliary sensors tabs

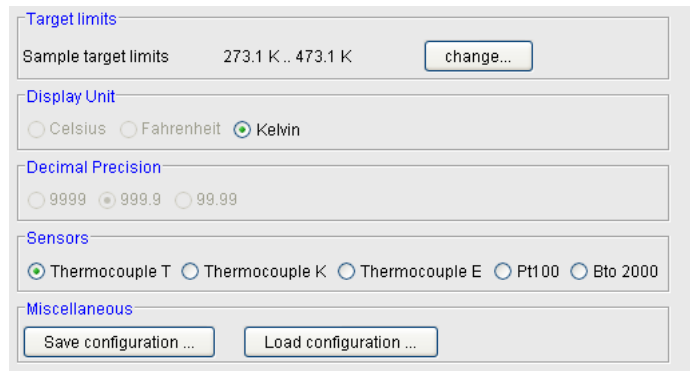


For each channel, the sensor type, the measured value and the scan status are displayed. Only the scanned channels are updated. **Celsius** or **Kelvin** display units can be configured. A description can be assigned to each channel.

Configuration tabs

1.10

Figure 1.21. Window of the configuration tabs



Target limits

1.10.1

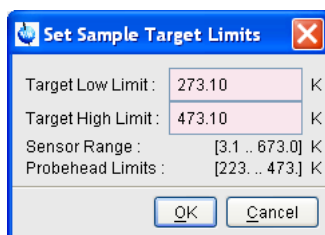
This frame allows to set the range of valid Target temperature in order to avoid probehead damages. The operator will not be able to enter a target temperature outside this range.

Each sensor has its own temperature range.

The probehead defined with **EDHEAD**, may not have the same temperature range.

The Target high and low limit must fit into these two ranges.

Figure 1.22. Window of the target limits settings



With the BVT3000/BEST and the BVT3000HC, you can define the target limits for the Liquid and HPC temperature.

Display unit

1.10.2

Allows you to select the desired temperature display unit (Celsius, Kelvin, Fahrenheit). Selecting a different display unit will immediately reconfigure the Eurotherm controller.

The currently active temperature unit is marked. Not available display units are grayed.

Decimal precision

1.10.3

Set the decimal precision to 0, 1 or 2 digits. Not available for most temperature controllers.



Warning: changing the decimal precision has an influence on the available temperature range.

Table 1.1. Decimal precision

0 decimal	-999. to 9999.
1 decimal	-99.9 to 999.9
2 decimals	-9.99 to 99.99

Sensors

1.10.4

Select the sensor you have connected. Only the available sensors are proposed, others are grayed. Selecting a different sensor will immediately configure the Eurotherm controller.

Load/Save configuration

1.10.5

Target, Max Output-Power, Gas Flow and Self-Tune settings (Proportional Band, Integral and Derivative time) can be recorded in a configuration file.

The file is located in the `.../exp/stan/nmr/lists/eurotherm/tcf` directory. You just have to give a name to the configuration file.

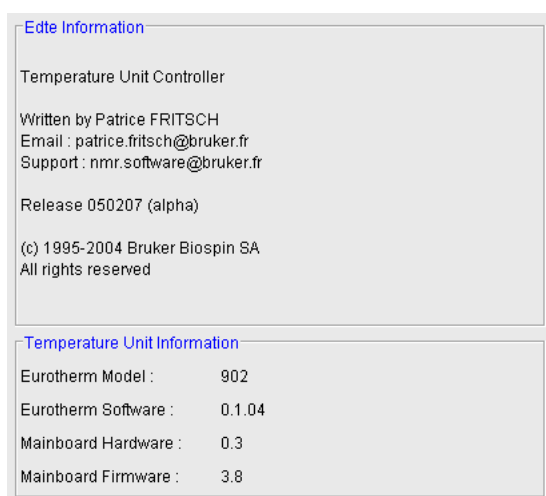
To read the configuration from a file, click the **Load configuration...** button and select a file. The parameters will be reloaded into the temperature unit.

Information Tab

1.11

The information tab reports important information about Edte, the Eurotherm and the mainboard (if available). These information may be useful for the technical support.

Figure 1.23. Edte information



Comment and suggestions are welcome. Please send your requests to the support email : nmr.software@bruker.fr

The status Bar

1.12

The lower part of the Edte window contains a status bar.

Figure 1.24. Edte Status bar



It contains general information about the VTU:

- Recording state
- Correction state
- Ramp state
- VTU model
- Connected options

The EDTE Software

- Booster presence
- Auxiliary sensor presence

The Eurotherm controller is used to monitor and control the temperature of the gas flow surrounding the sample. To do this optimally it needs to measure how the system responds to changes in the regulation heater power. The required information is obtained during the self-tune routine. If a proper self-tune is not carried out, then the system will be slow to reach equilibrium and there may be a large overshoot or undershoot when a new target temperature is set.

What is a self-tune

2.1

A tuning is necessary to match the characteristics of the controller to that of the process being controlled in order to obtain good control.

This means:

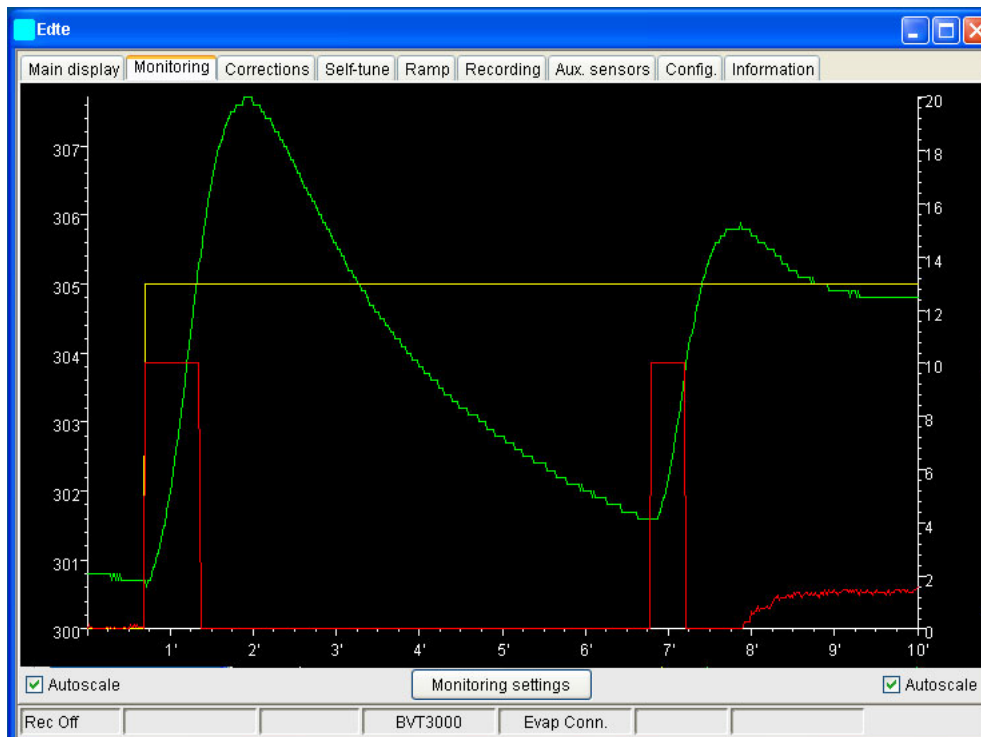
1. Stable control of the temperature at the setpoint without fluctuation
2. No overshoot or undershoot
3. Quick response to deviation from the setpoint
4. Self-tune involves calculating and setting the values of the P.I.D. parameters:
 - **Proportional Band (P)**
The Proportional Band is the bandwidth over which the output power is proportioned between 0 and the max power. Outside this bandwidth, the max power is applied.
 - **Integral Time (I)**
Determines the time taken by the controller to remove steady-state error signals.
 - **Derivative Time (D)**
Determines how strong the controller will react to the rate-of-change of the measured value.

Self-Tune process

2.2

The regulation heater is switched on at maximum power (subject to the setting of HO - high output) for one or several short periods of time. The Eurotherm controller measures the response of the system to this power. From the response, three parameters TI, TD and XP (P.I.D. parameters) are automatically calculated and set.

Figure 2.1. Self-Tune process



A further parameter (LB overshoot limitation) may also be set, if the range over which the self-tune is carried out is sufficiently large.

When should a self-tune be carried out ?

2.3

Changes that warrant reactivating self-tune are:

1. Changing the rate of flow of input gas as displayed on the BVT3000 front panel.
2. Large changes in temperature of input gas. Minor temperature fluctuations caused by room temperature changes will not upset the temperature regulation.
3. Altering the position of the thermocouple.
4. Exchanging a probe.
5. Changing the target temperature by more than 10K.

Changes that do not require reactivating self-tune :

6. Changing the sample.
7. Changing the target temperature by less than 10 K.
8. Turning sample spin on or off.

How to perform a self-tune

2.4

1. The self-tune should be carried out under the exact conditions of operation. Insert the heater, thermocouple and sample. The heater can be switched on but first ensure that the target temperature is not too high. If a cooling unit or N₂ heater are to be used, then they should be operating normally. Ensure that the gas flow is attached to the probe base. If the experiments are normally carried out with spinning samples, then the sample should spin during the self-tune.
2. Enter the command "edte".
3. Be sure the heater is on and click the **Self-Tune Tab** menu to activate the Self-Tune Window.
4. The self-tune target is set to the current target temperature. This value can be changed. The self-tune max power is set to the current Output Power. It may also be changed.
5. Start the self-tune process by clicking the **Start Self-Tune** button. **Self-Tune is running** is displayed in the status-bar. Clicking the **Stop Self-Tune** button will stop the process.
6. When **Self-Tune is performed**, the values of XP, TI and TD are loaded. These values may be changed manually and applied with the **Apply PID changes** button.
7. The new target temperature is automatically set to the Self-tune target temp and regulation is active.



It is possible to have Proportional only, or 'PD' or 'PI' control. Just set the Integral or/and Derivative time to 0.0 before starting a self-tune. The tuner will leave them off and will not calculate a value for them.

How to store temperature parameters

2.5

Different operating conditions may require different P.I.D. parameters. For example, two types of routine experiments may be regularly carried out, room temperature work with a 5mm probe and low temperature work with a 10mm probe.

It is possible to store the two sets of edte parameters in two separate files which can quickly be loaded.

Save a set of temperature parameters

2.5.1

1. Enter Edte.
2. When a suitable set of parameters has been set, select the Configuration Tab and click the **Save Configuration...**
3. In the browser, type in a new name (e.g.10mmlow) and press **OK**. The parameters are stored in the file 10mmlow.tcf in the **/exp/stan/nmr/lists/eurotherm/tcf** directory,

Self-Tune

Some operators prefer to carry out a self-tune each time a probe is changed and do not keep a set of stored parameters.

Read in a set of temperature parameters

2.5.2

1. Enter “edte”.
2. Click on the **Configuration Tab** and select **the Load Configuration...** button.
3. The browser will display the existing files. Select the one to be loaded and click **OK**.

Adaptive Tune

2.6

For routine work, it is recommended that you operate with ADAPTIVE TUNE set to “off”. Adaptive tune is designed for systems that experience changing conditions e.g. change in rate of air flow, change in input air temperature etc. Such variations are not normal for routine NMR work and so adaptive tune should not be required.

However, if you wish to ensure that the P.I.D. parameters are constantly monitored and optimized then there may be an advantage to working with ADAPTIVE TUNE set to “on” by activating the **Adaptive-Tune** toggle button of the **Self-Tune** Tab.

Downloading a new firmware

3

Edte provides a tool for downloading the firmware of a VTU, but you should not try to download a new firmware without the permission of the support service.

Hex file location

3.1

The hex file containing the firmware to download is located in:

- the conf/instr/servtool/vtu sub-directory under Linux.
- the conf\instr\servtool\vtu directory under Microsoft Windows 2000 or XP of the TopSpin installation path.

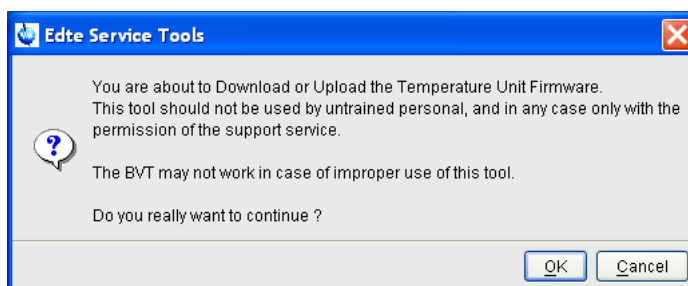
Download Process

3.2

In TopSpin, the download tool is a hidden parameter of the Edte command. Ensure that Edte is not running (the download will not start).

In the command line, type **edte -download**.

Figure 3.1. Edte-download tool

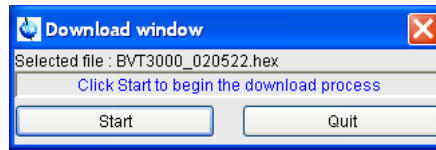


Click **OK** in the warning dialog, and enter the NMR super user password to continue.

In the File selection window, select the hex file and click the **OK** button. The Download window appears:

Downloading a new firmware

Figure 3.2. Download window



As indicated, click the **Start** Button to begin the download process.

If an error appears after a few seconds (DL1 command failed), do not close the Download Window, but click the **Start** button immediately, until the download starts.

Do not stop the download process once it is started.

The download process may last several minutes.

Depending on the TopSpin version you are running, you will have a download progress information as a percentage or as an amount of Kbytes downloaded.

The message **Download successfully done** should appear after a while.

Start **Edte** to verify that the VTU is correctly recognized.

BVT3000/BEST & BVT3000HC

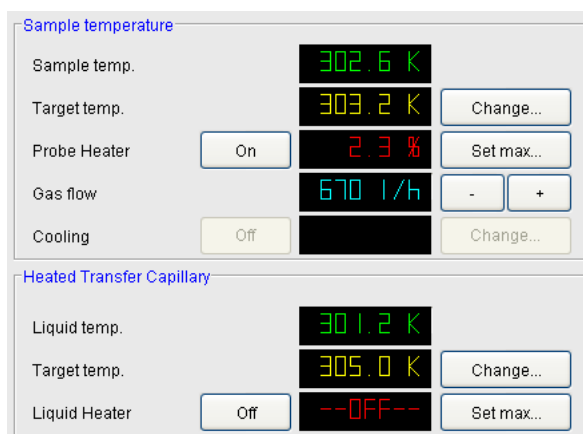
4

BVT3000/BEST Main Display

4.1

When a BVT3000/BEST is detected, Edte adds three lines to control the Heated Transfer Capillary temperature.

Figure 4.1. BVT3000/BEST display



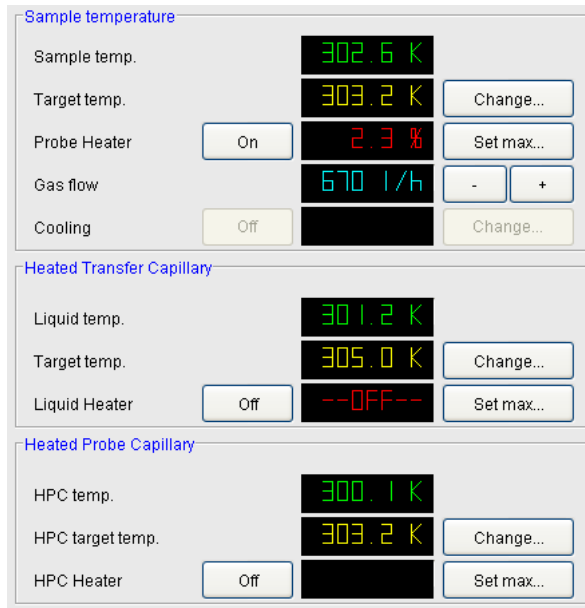
BVT3000HC Main Display

4.2

For a BVT3000HC, three additional lines are added to control the Heated Probe Capillary temperature.

The liquid temperature is controlled in the same way as for the BVT3000/BEST.

Figure 4.2. BVT3000HC Main Display



The sensor does not directly measure the sample temperature but the temperature just below the sample. There might be a difference between the real sample temperature and the measured value. Batman has been developed in order to determine the eurotherm target temperature in order to have the desired temperature in the sample.

Batman is an AU program, launched from within TopSpin, that automatically calculates this temperature difference. The process may need several steps:

1. Set initial eurotherm target temperature to the desired sample temperature
2. Set the temperature
3. Wait for stabilization
4. Compute the real sample temperature using the chemical shift
5. Compute the new eurotherm target temp
6. repeat steps 2.5 until the desired sample temperature is reached.

In order to perform this set of calculations, BATMAN first requires the input of several fundamental parameters:

Target temperature in K (the desired probe temperature)

Stabilization time in seconds (the minimum period of thermal stability that must elapse before data are acquired)

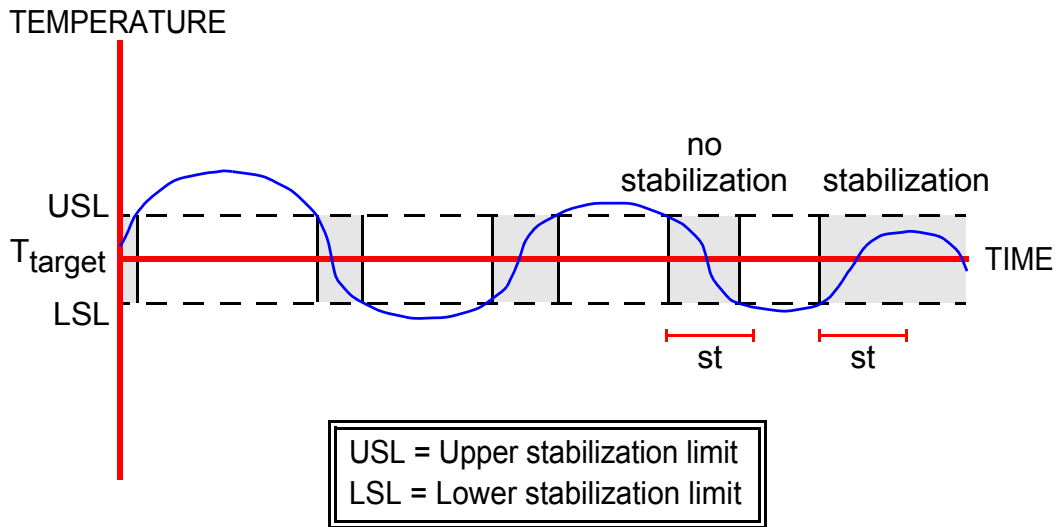
Precision (the maximum amount of temperature fluctuation allowed above and below the target temperature -- the temperature is considered «stable» when within this range)

Sample type ((G)lycol or (M)ethanol)

Sample origin ((P)ure MeOH/Glycol or (B)ruker MeOH/Glycol sample.

The final entry made by the user is a «CR» when the sample has been introduced into the spectrometer. Subsequently, BATMAN picks the appropriate peaks from the acquired spectrum and stores the chemical shift difference in the file peaklist. Additional chemical shift measurements, made using this program, are stored in the same file. These values are processed to generate the linear systems used to correlate sample temperature to target/probe temperature.

Figure 5.1. Thermal stabilization process



The curve shows a diminishing thermal fluctuation until stability around the target temperature is achieved. Shaded regions represent times at which stabilization occurs. These times must be longer than the prescribed stabilization time (st) in order for a signal to be acquired.

Factors that slow the signal acquisition process are:

1. prescription of a long stabilization time
2. prescription of a narrow precision window.

Directories and File Formats

6

Edte Directories

6.1

Edte uses 4 directories all located in `/exp/stan/nmr/lists/eurotherm`.

- config

This directory contains configuration files used internally by edte.



The user should not modify these files.

- corr

This directory contains the correction files generated by the **Save as...** button in the **Corrections** window. They have all the same extension (.cor).

- tcf

This directory contains the Variable Temperature Unit configuration files generated by the **Save Configuration...** button in the **Configuration Tab**. The same directory is used to display the list of available files when the **Load Configuration...** button is activated.

A TCF file contains several informations about the Variable Temperature Unit. These files are generated when using the button of the configuration panel.

Two sections are used to store the VTU parameters.

Version

This section identifies the Variable Temperature Type. A BVT3000 tcf file may not be compatible with a BDTC tcf file. The software checks the version type.

Parameters

This section contains the parameters of the Variable Temperature Unit.

The setpoint value is associated to the **SP** parameter.

HO represents the Max Ouput Power (0-100).

AF is the value of the GasFlow (0-15).

NH is the nitrogen heater power (0-100%).

XP, TI, TD are the PID values.

All these values can be set using the Edte Graphic User Interface.

There is no way to add other parameters to a tcf file. If it is necessary to add other parameters, modifications must be done in the software.

Example

```
[Version]
Version=BVT3000
```

```
[Parameters]
SP=320.00
HO=20.00
AF=6
NH=-1
```

```
XP=68.40
TI=160.00
TD=26.70
```

Compatibility

Files stored with a previous version of Edte (before XWin-NMR 2.0) cannot be loaded with this new version of the software.

The user will have to create new tcf files.

As previous parameter files are ASCII files, it is possible to print them from a unix-shell. They are located in the `/exp/stan/nmr/lists/eurotherm` directory and have the following format:

SL 303.3
HO 20.0
TI 10.0
TD 1.7
 HB 7.6
 LB 26.3
XP 5.3
 HP1
 NP0
 BP 0.0
 RR 0.0
 TR 17.0
 S2 298.0
 OS> 0
 XS> 4

XP, TI, TD are the PID values. They can be manually entered in the Self-Tune Window.

SL is the setpoint (**SP**)
HO is the Max Output Power.
NP is the Nitrogen Power.

Correction files

6.2.2

Correction files are used to store the temperature corrections parameters as set in the **Temperature Correction...** menu. They are saved in the `/exp/stan/nmr/lists/eurotherm/corr` directory.



Parameters

*This file contains two sections: [ProbeHead] and [Correction].
 The [ProbeHead] section contains the Id and Description of the current probehead as set with **edhead**. A warning is displayed if the user wants to load a correction file which probehead does not match the current one.
 The [Correction] section contains the correction parameters (Offset and Slope) and the flag indicating it is enabled or not (Corr = On or Off).*

Example 1

This example shows the correction file when Correction is disabled.

```

[ProbeHead]
Id=7
Desc= 5 mm QNP 1H/13C/31P/19F Z-grad

[Correction]
Corr=Off
Slope=1.00000
Offset=0.00000
  
```

Example 2

This example shows a linear correction of 2 degrees.

[ProbeHead]

Id=7

Desc= 5 mm QNP 1H/13C/31P/19F Z-grad

[Correction]

Corr=On

Slope=1.00000

Offset=2.00000

With this set of correction is applied, a sample target temperature of 320K will be send to the Eurotherm as a 322K sensor target temperature.

AU Program and Command Line instructions

7

Using the TopSpin command line

7.1

One parameter and four commands are available to the user to interact with the temperature unit within an AU program or using the TopSpin command line.

The TE parameter

7.1.1



TE is always in KELVIN

TE contains the last target temperature applied or to be applied to the eurotherm.

In the following two lines:

```
te 320.0
teset
```

The TE parameter is set to 320.0K and its value is applied as the new target temperature.

The following two lines:

```
teget
1s TE
```

display the current sample temperature loaded with TEGET.

TESET

7.1.2

This command allows the user to send the value stored in TE to the temperature as the new target temperature.

Syntax:

```
teset
or
teset temp
```

When **TESET** is used without parameters, **TE** is used.

AU Program and Command Line instructions

TEGET

7.1.3

This command loads the TE parameter with the current target temperature.

Syntax:

```
teget
```

The command **1s TE** displays the value loaded with TEGET.

TEREADY

7.1.4

This command waits for a stabilisation time after that the defined precision has been reached.

Syntax:

```
teready Stabilisation_Time Precision
```

This command is used in conjunction with **TESET** in the following way (xwin-nmr command line):

```
teset 320.0  
teready 300 0.5
```

The target temperature will be set to 320K and **TEREADY** will wait additional five minutes (300 seconds) after the measured temperature had been 10 seconds in a 0.5K stabilization range (319.5 .. 320.5).

TEPAR

7.1.5

This command loads a parameter file previously stored with Edte using the **File - Save Configuration...** menu.

Syntax:

```
tepar  
or  
tepar file.tcf
```

When no parameter file is specified, the list of available parameter files are displayed in a list. Click a filename to apply its values.

Using an AU Program

7.2

All the above described function can be included in an AU Program. The syntax is a little bit different for some commands.

The TE parameter

7.2.1

Setting TE

```
STOREPAR("TE", value);
```

Reading TE

```
FETCHPAR("TE", &value);
```

where **value** is a float.

Reading the Sample Temperature

To read the Sample Temperature use FETCHPARS instead of FETCHPAR after a TEGET command:

```
TEGET;
FETCHPARS("TE", &value);
```

TEGET

7.2.2

Syntax:

```
TEGET;
```



If a compilation error occurs use the following line instead of TEGET:

```
{ SETCURDATA AUERR=CPR_exec( "teget", WAIT_TERM); }
```

TESET

7.2.3

Syntax:

```
TESET;
```

TEREADY

7.2.4

Syntax:

```
TEREADY(Stability_Duration, Precision);
```

where **Stability-Duration** is an integer, and **Precision** a float.

TEPAR

7.2.5

Syntax:

```
TEPAR(filename);
```

where filename is a string variable or constant string.

The following AU Program

```
...  
STOREPAR("TE", 320.0);  
TESET  
TEREADY(300, 0.5)  
TEGET  
Proc_err(1, «Sample Temperature is: %.2fK.\n», fTE);  
...
```

sets the target to 320.0K, waits for a 5 minutes stabilization time after a precision of ± 0.5 K and displays the reached Sample Temperature.

Troubleshooting

8

Unable to recognize the connected temperature unit

8.1

Have you set up the tty device used for the temperature unit during cf ?
Verify that the RS232 cable is correctly plugged in.

After a VTU power off/power on cycle, plug out and plug in the RS232 cable.
Try to restart Edte with an additional argument: **edte -ii**
If the error message occurs again, restart TopSpin.

With a BVT3000, the Ramp option does not respond when selecting RUN

8.2

Reason:

The Eurotherm 902 is not configured to allow ramps.

Solution:

The C4 parameter of the Eurotherm 902 must be set to 1000 to allow Ramps.
To do this, follow the instructions below:

The 6 gray buttons are labeled 1 to 6 from left to right.
Enter the configuration mode:
Power off the unit
Hold down button 1 & 2, and power on

Button 6 until ICONF is displayed
Button 1 - C1 is displayed
Button 6 until C4 is displayed
Button 4 - 0000 is displayed
Button 1 until the first digit (left one) is blinking
Button 5 to change its value (1000 is displayed)
Button 6 to exit this mode (C4 is displayed)
Button 1 to go back to ICONF
Button 6 to reach LEAVE
Button 1 to leave CONF mode

I cannot change the target temp

8.3

Symptom:

When an illegal TE value has been entered, the target temperature in 'edte' could not be changed anymore.

Workaround:

Start 'rstest', select option '6' (VTU)
After the prompt 'TEMP Command [?=help / menu / quit]:'
Type as command 'SW'.
If the answer is SW>0021 type now after the prompt 'SW>0020'.
Type then 'SL', add 1 to the answer (e.g. 'SL 295' => 'SL 296') and type 'SL 296',
then 'SL' again.
If the new value is accepted, your 'edte' problem will be solved.

Troubleshooting

RAMPS:

Another possible cause for this behavior is that ramps are active.

In that particular working mode, target temperature changes are not displayed on the Eurotherm or in Edte. The entered value is the new set point for the ramp. The displayed temp is the substitution ramp target. Switching to PID mode in the Ramp Panel, enables target temperature changes.

C Er UCONF error displayed on a BVT3000 after sensor setup

8.4

Symptom:

When setting up a new sensor in Edte, the BVT3000 with Eurotherm 902 may display "C Er UCONF". Also happens with Xwinmr 3.5PL6 and TopSpin 1.2.

Reason:

When the TopSpin status bar monitors the temperature, some communication takes place with the BVT. If the users changes the sensor type at the same time, it is possible that the eurotherm configuration is disturbed by this additional communication. Some pointers in the eurotherm may be corrupted, and wrong parameters modified.

If this error appears, the correct values must be entered manually in the Eurotherm:-(

Workaround:

Do not monitor the temperature when setting up a new sensor.

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