meusburger

Project Setup and configuration Tool

flexoTEMPMANAGER

Operation

Meusburger Georg GmbH & Co KG
Kesselstr. 42 | 6960 Wolfurt | Austria
T +43 5574 6706
office@meusburger.com | www.meusburger.com

Rev. 1.04.11
Technical changes reserved

Chapter 1 Introduction 4

Additional and continuative documents 4
Typographical Conventions 5

Chapter 2 Start of flexotempMANAGER 6

System prerequisites 6

Chapter 3 Communication concepts of flexotempMANAGER 7

Examples of Use 8
flexotempMANAGER and PSGCommServer on one PC, controller connected by Ethernet 8
flexotempMANAGER and PSGCommServer on one PC, controller connected serial 10
flexotempMANAGER and PSGCommServer on one PC, controller connected by CAN 13
flexotempMANAGER and PSGCommServer on two PCs, LAN, controller connected by Ethernet 16
flexotempMANAGER and PSGCommServer on two PCs, WAN, controller connected by Ethernet 18
View communication 20
Remote maintenance by VPN 20

Chapter 4 User Interface Segmentation 21

Header 21
Functions of the menu bar 22
Menu Bar: File 22
Menu bar Edit 25
Menu bar communication 26
Menu bar View 28
Menu Bar Extras 29
Menu bar ? 40
Functions of the symbol bar 41
Software version 41
ARP (Address Resolution Protocol) 43
TEMP-Command Wizard 44
Default addressing of components 45
Default configuration of the components 46
Simulated secondary mouse button 51

Chapter 5 Project 52

Create projects 52
Context menus on project level 54
Context menu for master components 54
Context menu for CAN components 65
Context menu for PCU components 66
Commentary for project 67
Info page 68
Notifications list - Changes 68
Notifications list - Project setup errors 68
Time Server 69

Chapter 6 In-/outputs 70

Digital inputs 71
System Input 71
Group Input 73
Zone input 74
Prioritization when processing digital inputs / markers 74
Analog inputs 75
Digital outputs 77
Control output 79
System alarm 80
Group alarm 81
Zone alarm 82
Virtual digital output 83
Further data 84
Release limit values 84
Heat sink temperature limit value 84
Analog outputs 85

Chapter 7 Communication by Profibus 87

Chapter 8 Communication by PROFINET IO 88

Chapter 9 Direct IOs 89

Accessing Direct IOs in flexotempMANAGER 89
I/O buffer access 89
CAN access 90
Direct IOs table 90
Direct IOs table - Type 94

Chapter 10 Status 95

Status Communication 95
Status Time Server 96
Info page 96
Parameters 97
Status Display Master Component 98
Status view <Status> Zone 1…n 99
Status view <Status control parameters> Zone 1…n 100
Status view <Status Controller> Zone 1…n 101
Status view <Status Channel flag/Timer> Zone 1…n 102
Status display on components 103
Status project setup 104
Status Profibus 104
Status PROFINET IO 104
Status Direct IOs 106
Status virtual digital inputs 107
Status virtual digital output 108
Status I/O buffer CAN components 109
Date / Time 109

Chapter 11 Trend 110

Menu keys for trend 113

Chapter 12 Components 117

Integration of a CAN slave 119

Chapter 13 Data recording 121

Start recording 121
Create new variable for data recording 122

Chapter 14 Template 125

Chapter 15 Appendix 127

Connection status flexotempMANAGER to PSGCommServer 127
Connection status interface to controller 127
Status controller/Master component 128
Access via Direct IOs 130
- Access via CAN-Bus 130
- Access via Ethernet 131
- Access via Profibus 131
- Access via PROFINET IO 131
- Access via CoDeSys 131

Software version of components 131
Version History 132

1 Introduction

flexotempMANAGER is

- a project setup and configuration tool
- for visualization of parameters and status in form of value and graphic displays

for all flexotemp® components.

In this document the operation of flexotempMANAGER is described.

1.1 Additional and continuative documents

	System configuration & project setup	Information on this topic are in the operating instructions **Temperature control system flexotemp® System Configuration & Project Setup**
	Parameters	Information on this topic are in the operating instructions **Temperature Control System flexotemp® Parameter**
	Protocol PSG II	Information on this topic are in the protocol description **PSG II** and the corresponding object lists.
	Protocol PSG II Ethernet (ASCII)	Information on this topic are in the protocol description **PSG II Ethernet (ASCII)** and the corresponding object lists.
	Protocol Profibus DP	Information on this topic are in the protocol description **Profibus DP** and the corresponding object lists.
	Protocol Modbus	Information on this topic are in the protocol description **Modbus** and the corresponding object lists.
	Protocol Modbus/TCP	Information on this topic are in the protocol description **Modbus/TCP** and the corresponding object lists.
	Protocol Profibus DPEA	Information on this topic are in the protocol description **Profibus DPEA** and the corresponding object lists.
	Protocol PROFINET IO	Information on this topic are in the protocol description **PROFINET IO** and the corresponding object lists.
	Protocol CANopen	Information on this topic are in the protocol description **CANopen** and the corresponding object lists.
	Installation and Handling CoDeSys	Information on this topic are in the description of Installation and Handling of **Temperature control system flexotemp® CoDeSys**.

Technical changes reserved

1.2 Typographical Conventions

Symbols and conventions are used in this manual for faster orientation for you.

Symbols

	Caution	With this symbol, references and information are displayed which are decisive for the operation of the device. In case of non-compliance with or inaccurate compliance there can result damage to the device or injuries to persons.
	Note	The symbol refers to additional information and declarations, which serve for improved understanding.
	Example	With the symbol, a function is explained by means of an example.
	Reference	With this symbol, information in another document is referred to.
	FAQ	Here FAQ (Frequently Asked Questions) are answered.
↗		Cross references are marked with the character f. In the pdf version of the document the objective of the cross reference is reached via the link.
`Equations`		Calculation specifications and examples are represented in this way.
<View>		Menu points (e.g. view) are represented in this way.
|Project|		Windows (e.g. project) are represented in this way.
n.a.		Not applicable, not existing

The displays/views presented in flexotempMANAGER are exemplarily, because

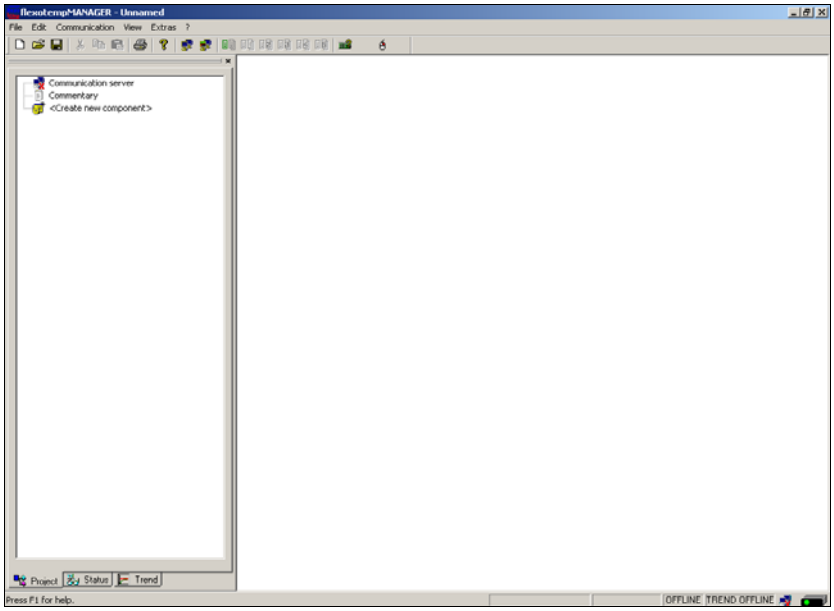
- names of components
- zone names

etc. may have been modified compared to the standard delivery.

2 Start of flexotempMANAGER

After the standard installation of flexotempMANAGER is completed successfully, the executing program is located in the directory
→ Start → Programs → PSG Plastic Service GmbH → flexotempMANAGER

The first call of the program shows the following operator interface.



Each further call of the program shows the stored settings for the operator interface of the login before (see chapter ↗User Interface Segmentation)

As long as there are no changes in the setting, the software is stored on the directory local data medium (C:) → PSG → flexotempMANAGER.
(flexotempMANAGER SW-Version before 1.02.06: local data medium (C:) → Programs → PSG → flexotempMANAGER)

The program executes no registry entries at installation.
After installation, the program directory can be completely copied on a storage medium and be used as a portable version.

2.1 System prerequisites

Processor	Intel or comparable
Clock frequency	At least 500 MHz
Random access memory	512 MB RAM recommended
Hard disk	At least 150 MB
Graphic board	SVGA compatible
Display resolution	1024 x 768 Pixel
Operating system	Windows 2000 SP4, Windows XP Professional SP3, Windows Vista SP1
Applications	Adobe Acrobat Reader 7.0
Online connection	Optional
Communication	Ethernet LAN, RS232 (optional for interface converter), USB (optional for interface converter)

Technical changes reserved

3 Communication concepts of flexotempMANAGER

For a better distribution of tasks in the network, the client server model was implemented in flexotempMANAGER.

The flexotempMANAGER as operator interface and client, requires services from the server PSGCommServer (communication server), that take care of the communication to the controllers.
That provides

- a decoupling of interfaces and program
- the use of different interfaces for several controllers in one project
  - serial interface
  - Ethernet interface
  - CANBus (driver PSG SKUSBCAN supported)

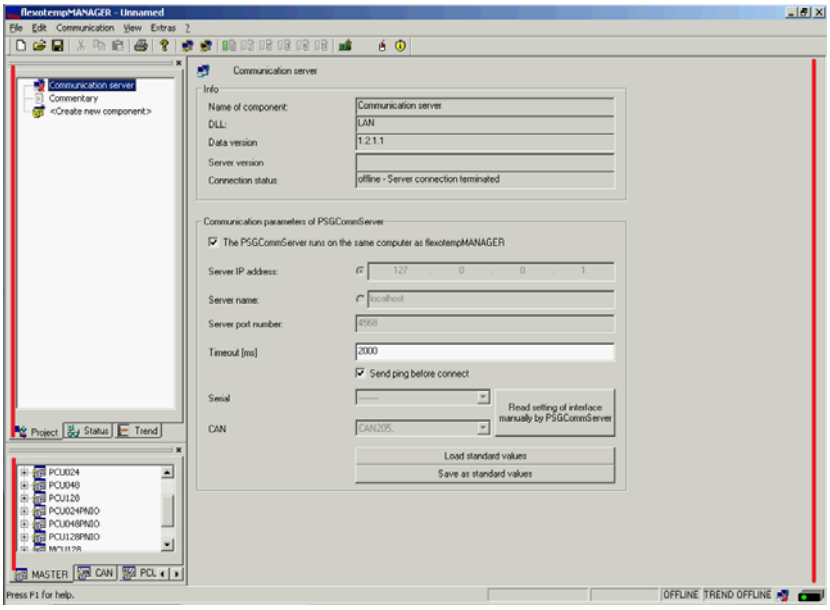
Client and server can run on the same or different computer hardware.

flexotempMANAGER works project oriented. In the window |Project| the communication server is shown upmost. By selection of the communication server, its settings appear in the window |Selection depended content|. All, connected to the communication server, belongs to one project.

View

Project

Components



Selection dependent content

By the menu item <Create new component> controllers (Window |Components| Register <Master>) are connected to the communication server.

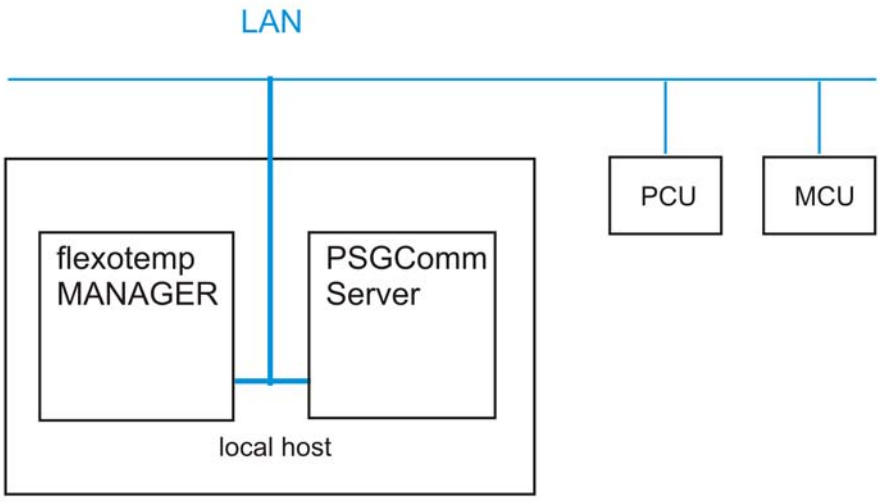
Which device architectures are possible and which settings are necessary, see chapter ↗Examples of Use.

For the possible status please see chapter ↗Connection status flexotempMANAGER to PSGCommServer.

3.1 Examples of Use

In the following examples is described, in which environment the flexotempMANAGER and the PSGCommServer are running and how the controllers can be connected.

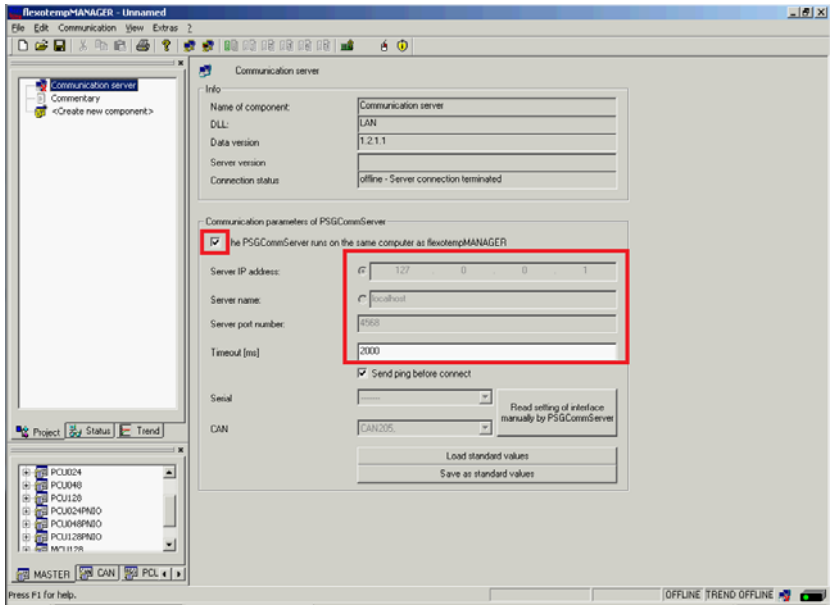
3.1.1 flexotempMANAGER and PSGCommServer on one PC, controller connected by Ethernet



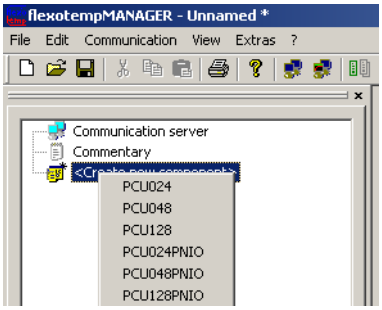
The flexotempMANAGER and PSGCommServer are running on the same computer hardware.
On the communication server side and under
Menu bar → <Extras> <Options> <Communication parameters>, tick ☑ the menu item <PSGCommServer runs on the same computer as flexotempMANAGER>.

PCU and/or MCU are connected by Ethernet.

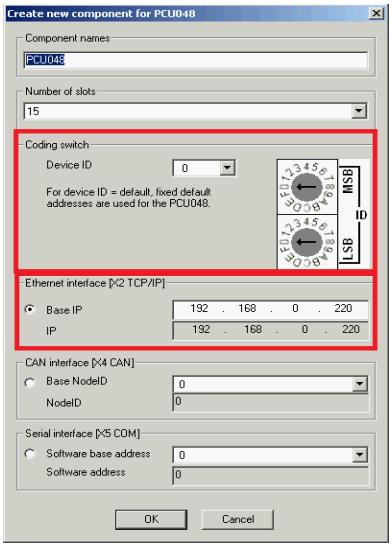
Communication server side

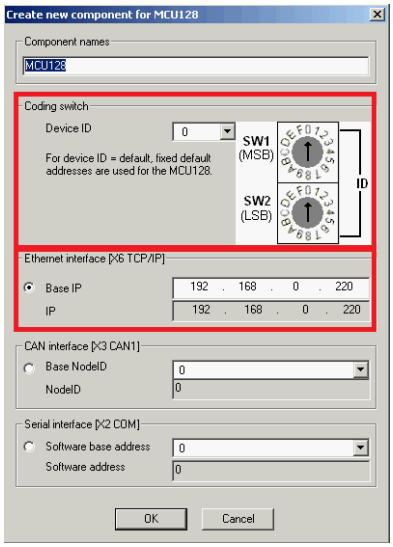


<Create new component>



PCU by Ethernet and/or
MCU by Ethernet



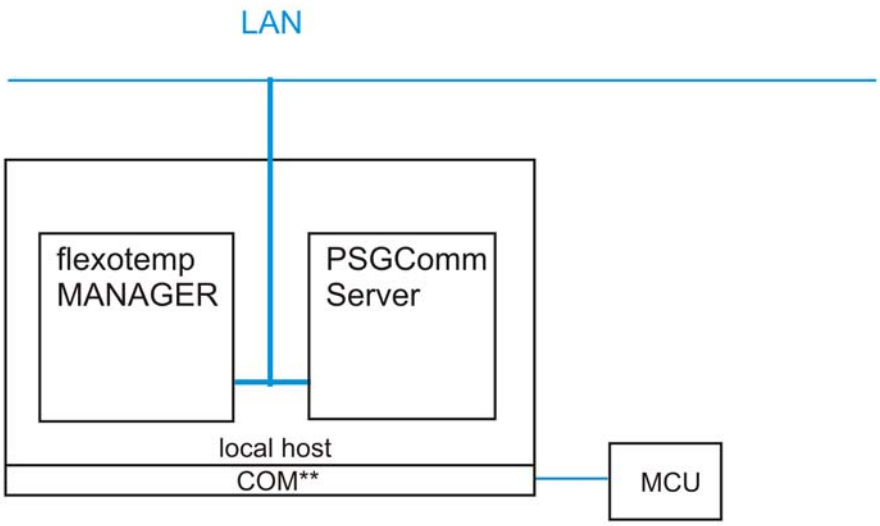


The resulting address (IP) of the Ethernet interface is a combination of the interface depending base part (base IP) and the device ID. The resulting address must be unique for all controllers of a project.

The base part is configured and must be set to the same subnet mask (here: 192.168.0.***) as the client server PC.

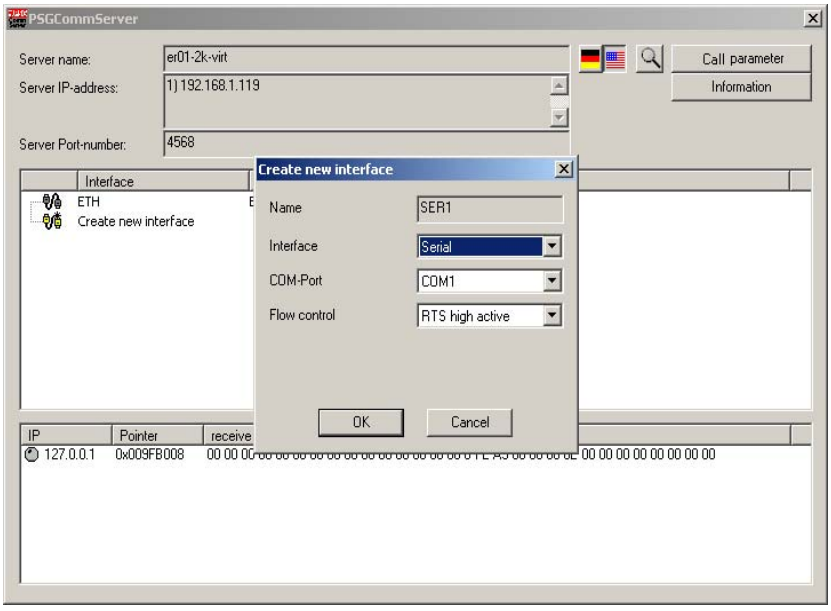
The device ID (here: 0) is set by rotary switch on the controller.

3.1.2 flexotempMANAGER and PSGCommServer on one PC, controller connected serial



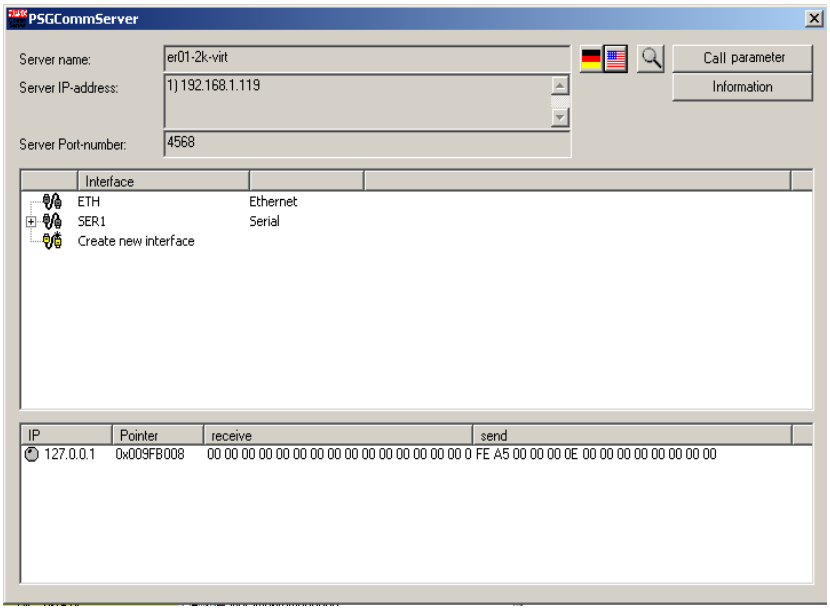
The flexotempMANAGER and PSGCommServer are running on the same computer hardware.
On the communication server side and under
Menu bar → <Extras> <Options> <Communication parameters>, tick ☑ the menu item <PSGCommServer runs on the same computer as flexotempMANAGER>.

MCU is serial connected to COM1 (for example).

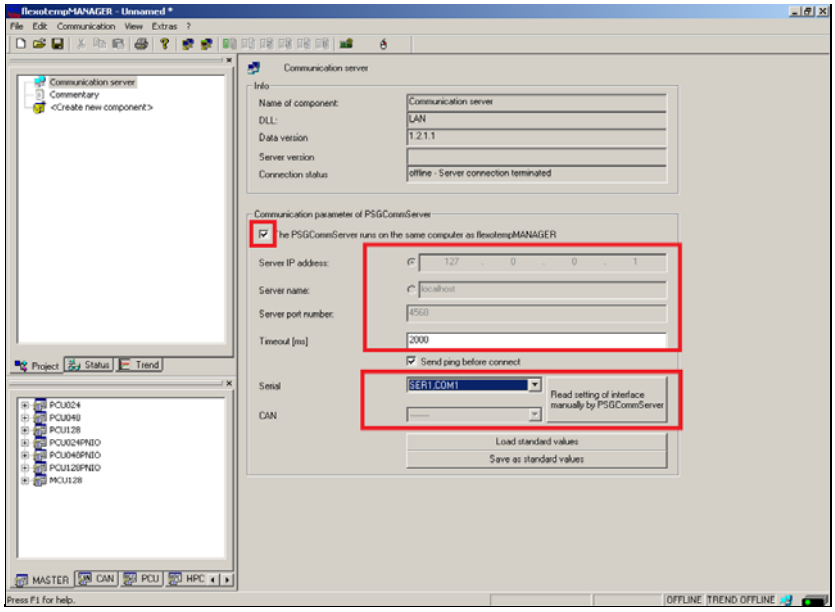
PSGCommServer	

PSGCommServer Create serial interface	Activate the PSGCommServer (by task bar). In the free area under interface, select the menu item <New> with the secondary mouse button. Select as interface <Serial> and a free port COM** (here: COM1).

PSGCommServer
Serial interface existing

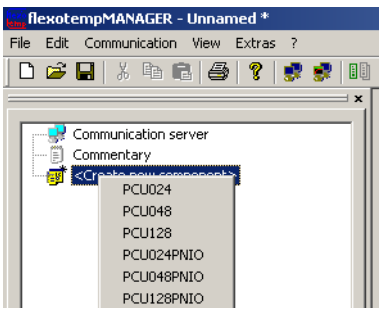


Communication server side

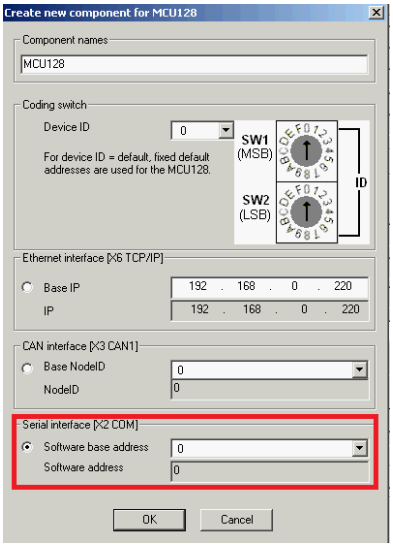


In flexotempMANAGER the available settings for PSGCommServer can be imported by <Read settings of interface manually by PSGCommServer> (here: SER1, COM1).

<Create new component>



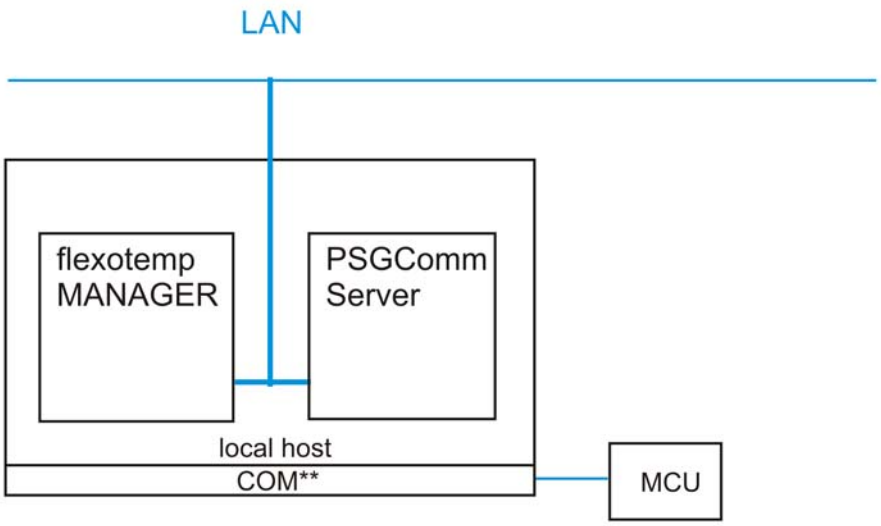
Connect MCU (serial)



The MCU with software address 0 (software base address=0, device ID=0) is addressed by COM1.

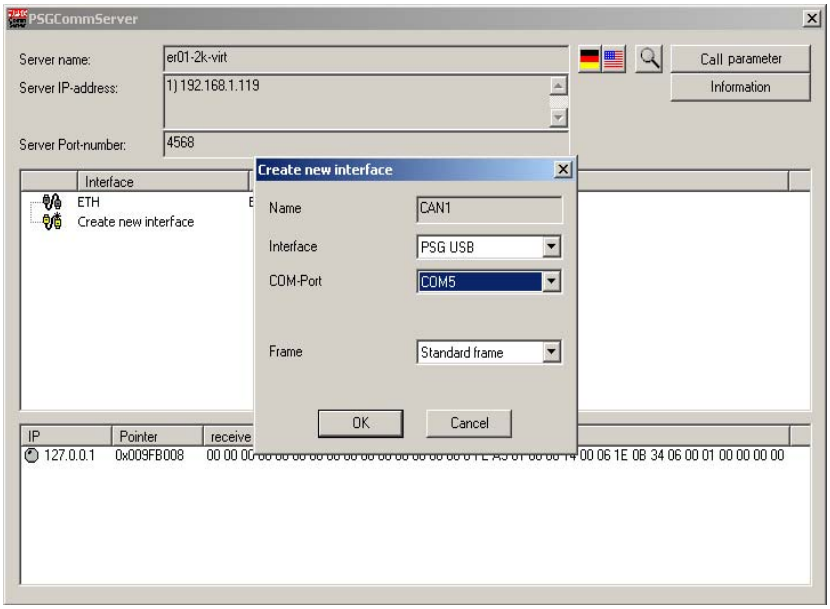
Technical changes reserved

3.1.3 flexotempMANAGER and PSGCommServer on one PC, controller connected by CAN



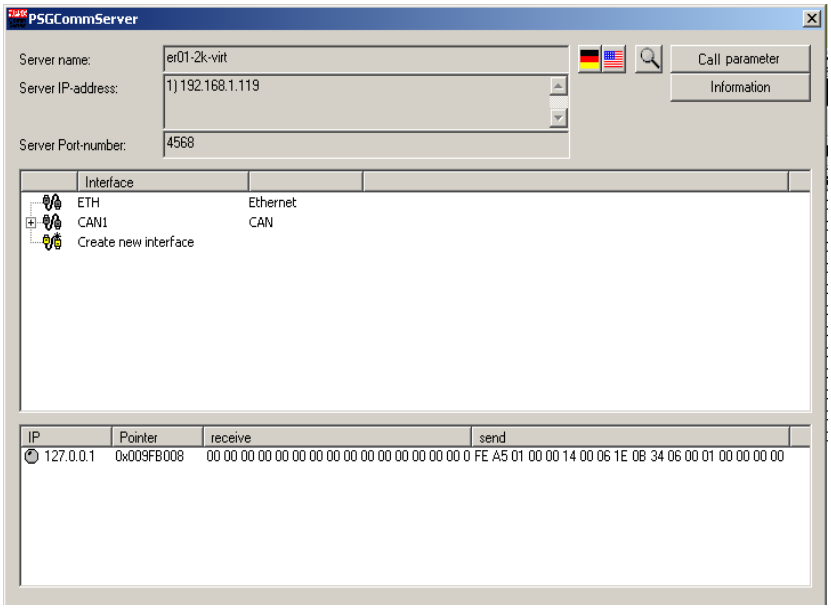
The flexotempMANAGER and PSGCommServer are running on the same computer hardware.
On the communication server side and under
Menu bar → <Extras> <Options> <Communication parameters>, tick ☑ the menu item <PSGCommServer runs on the same computer as flexotempMANAGER>.

MCU is connected by CAN to COM5 (for example).

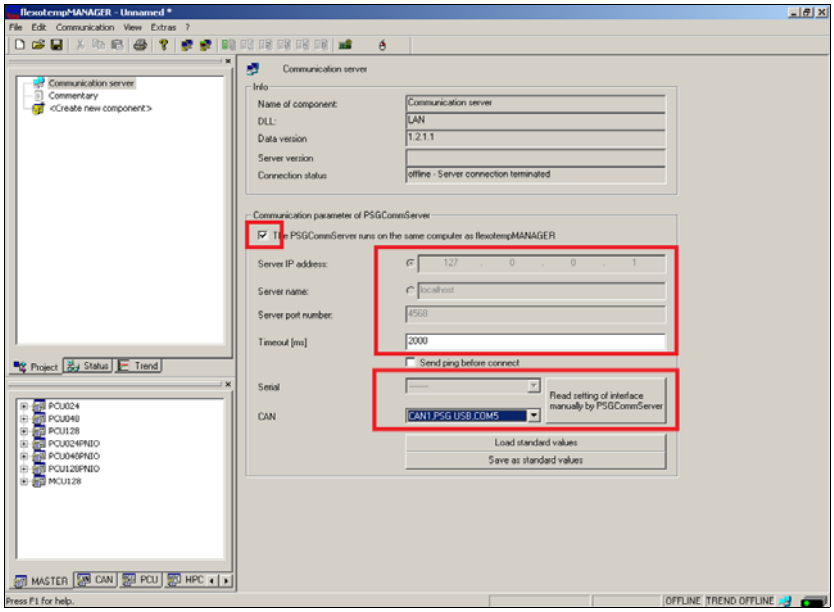
PSGCommServer	
PSGCommServer Create CAN interface	Activate the PSGCommServer (by task bar). In the free area under interface, select the menu item <New> with the secondary mouse button. Select as interface <PSG USB> and a free port COM** (here: COM5).

The driver for the CAN Dongle is already installed. If not, the Dongle is detected as new hardware on the computer and a driver is required. The COM port allocated can be determined, e.g. for operating system Windows 2000, by <My computer> <Administration> <Device manager> <Connection (COM and LPT)> and must be specified in the PSGCommServer.

PSGCommServer
CAN interface existing

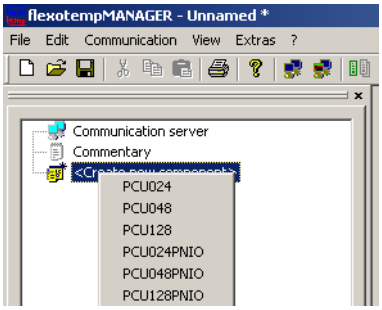


Communication server side

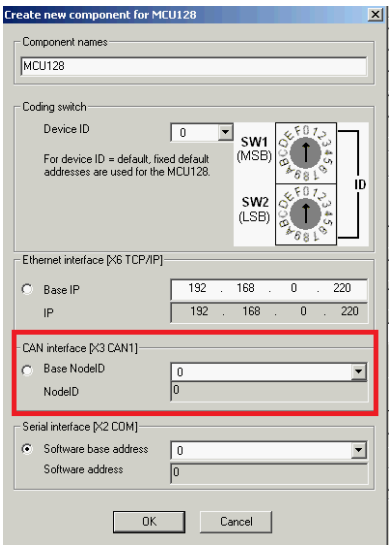


In flexotempMANAGER the available settings for PSGCommServer can be imported by <Read settings of interface manually by PSGCommServer> (here: CAN1, PSG USB, COM5).

<Create new component>

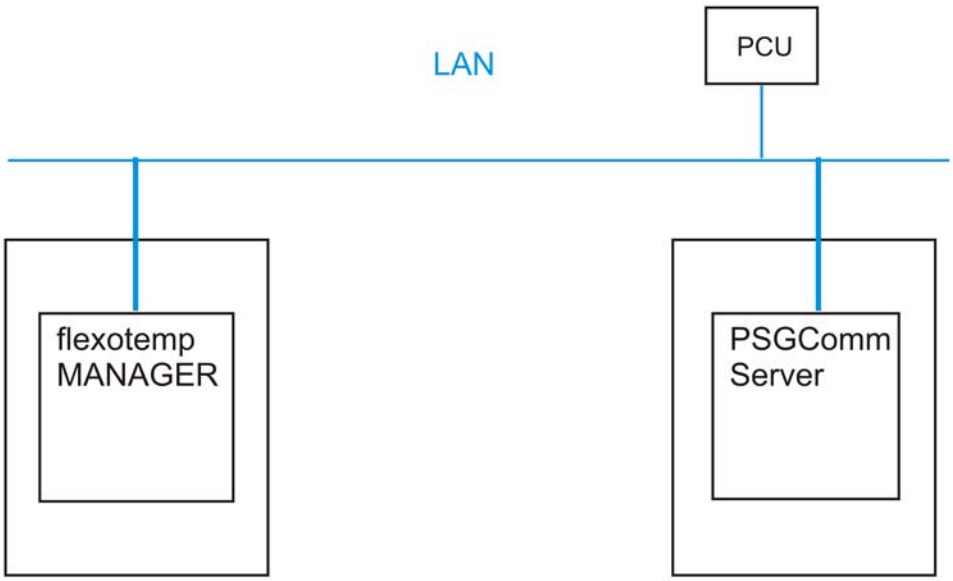


Connect MCU by CAN



The MCU with the NodeID 0 (base NodeID=0, device ID=0) is addressed by COM5.

3.1.4 flexotempMANAGER and PSGCommServer on two PCs, LAN, controller connected by Ethernet

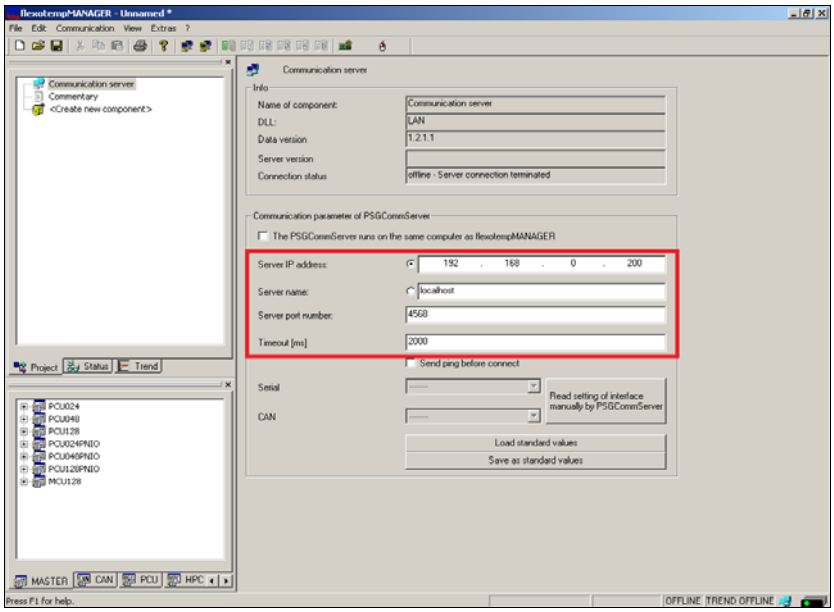


E.g. for remote control by remote work station in a network.

The flexotempMANAGER and the PSGCommServer are running on the two different computers.
On the communication server side and under
Menu bar → <Extras> <Options> <Communication parameters> the PSGCommServer must be clearly identified by IP address, server name and port.

PCU is connected by Ethernet.

Communication server side

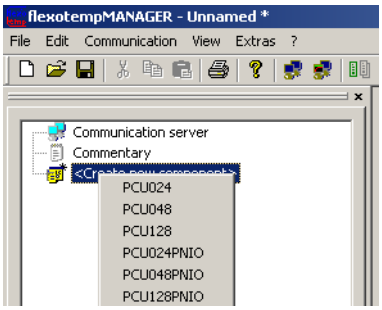


The PSGCommServer must be clearly identified by IP address, server name and port.

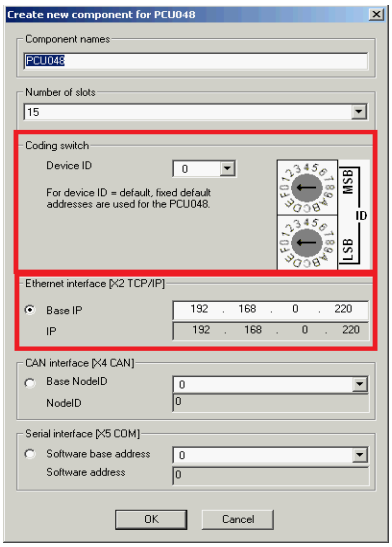
The settings for communication parameter PSGComm-Server can be permanently stored by the button <Save as standard values> (until new save as standard values).

The firewall must be adapted accordingly.

<Create new component>



PCU by Ethernet

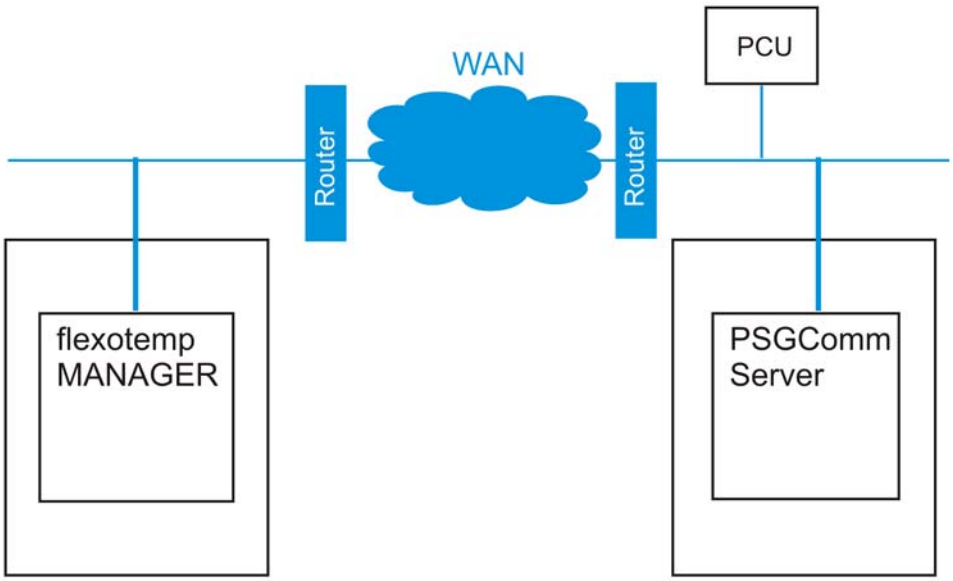


The resulting address (IP) of the Ethernet interface is a combination of the interface depending base part (base IP) and the device ID. The resulting address must be unique for all controllers of a project.

The base part is configured and must be set to the same subnet mask (here: 192.168.0.***) as the client server PC.

The device ID (here: 0) is set by rotary switch on the controller.

3.1.5 flexotempMANAGER and PSGCommServer on two PCs, WAN, controller connected by Ethernet

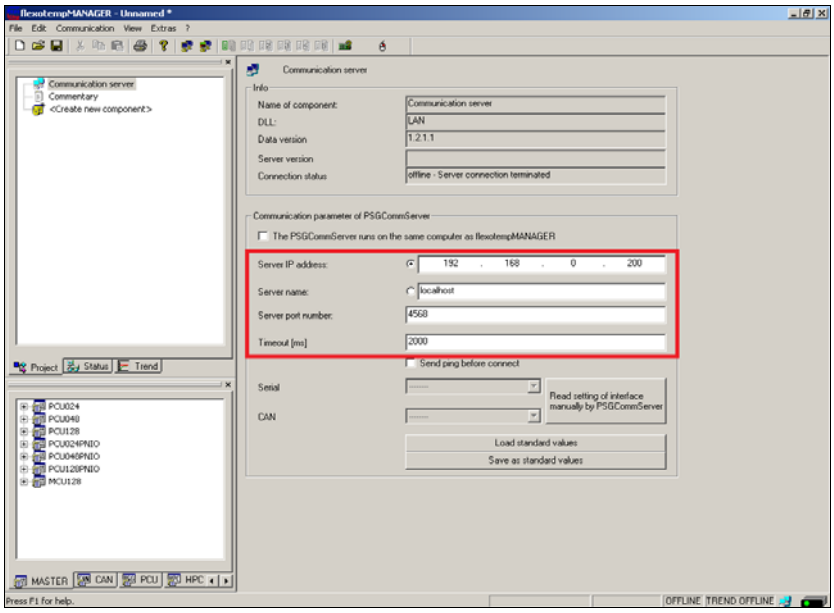


E.g. for remote control of a control system by PC over WAN in another network.

The flexotempMANAGER and the PSGCommServer are running on the two different computers.
On the communication server side and under
Menu bar → <Extras> <Options> <Communication parameters> the PSGCommServer must be clearly identified by IP address, server name and port.

PCU is connected by Ethernet.

Communication server side

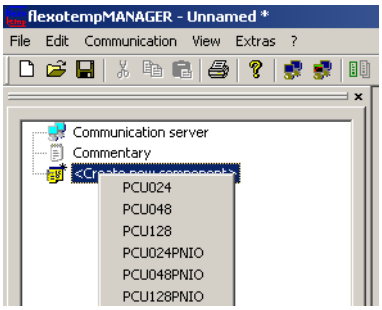


The PSGCommServer must be clearly identified by IP address, server name and port.

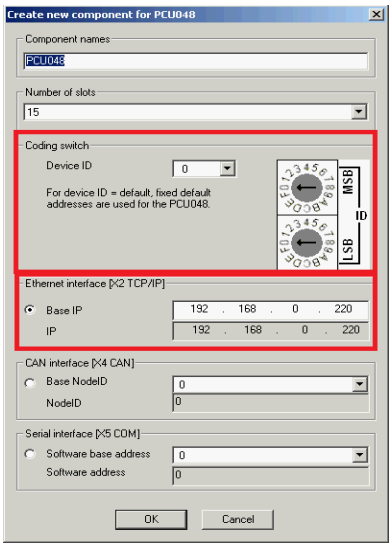
The settings for communication parameter PSGComm-Server can be permanently stored by the button <Save as standard values> (until new save as standard values).

The firewall must be adapted accordingly.

<Create new component>



PCU by Ethernet



The resulting address (IP) of the Ethernet interface is a combination of the interface depending base part (base IP) and the device ID. The resulting address must be unique for all controllers of a project.

The base part is configured and must be set to the same subnet mask (here: 192.168.0.***) as the client server PC.

The device ID (here: 0) is set by rotary switch on the controller.

For the connection of networks with different IP ranges, connected by WAN, routers are attached.

3.2 View communication

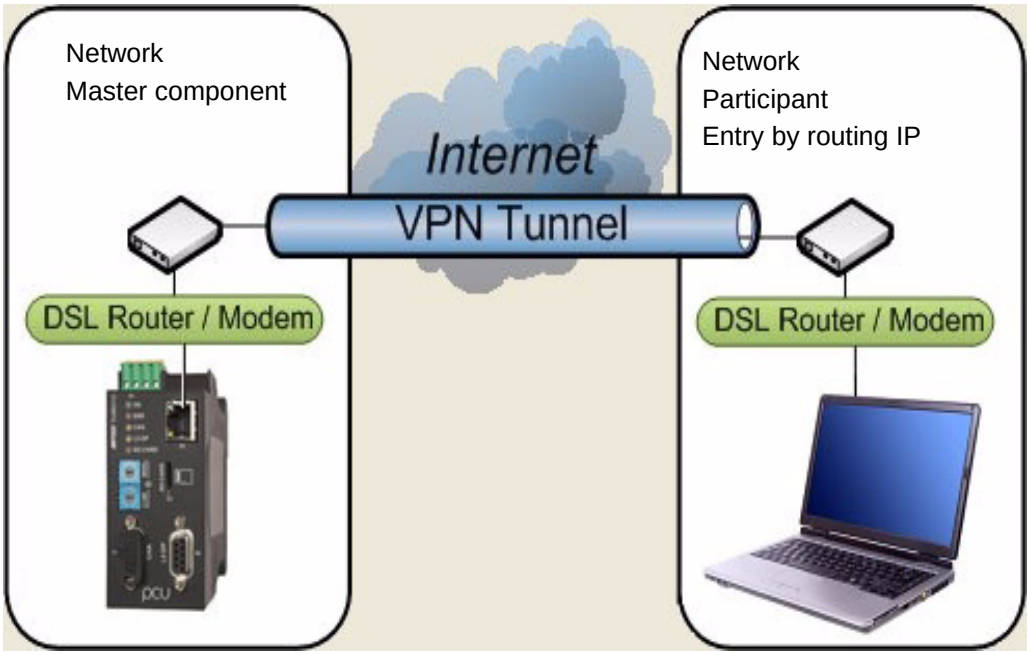
In the window |Project| under <MCU/PCU> <Communication> the communication parameters for the used interface, are set. The settings are transferred to the controller. The active interface is indicated by color.

Changes in the project setup for the active interface, may result in communication problems (see chapter ↗Status Communication).

In the view communication, the controller can be excluded from the polling cycle by ☑ <Set communication for this component out of service>. The icon of the controller shows this.

The interface settings are only valid, when the interfaces are physically existing.

3.3 Remote maintenance by VPN



Remote maintenance by VPN (virtual private network) for example PCU

Remote maintenance by VPN ties the participant of the network (input of any IP under Routing IP) to the network of the master component, without networks being compatible with each other.

A so called VPN tunnel is build between the client (Notebook or PC) and the VPN server. The data is exchanged between client and VPN server.

4 User Interface Segmentation

The segmentation of the user interface depends on the views to be displayed. When all views are selected, the default user interface appears as follows.

View

Symbol bar

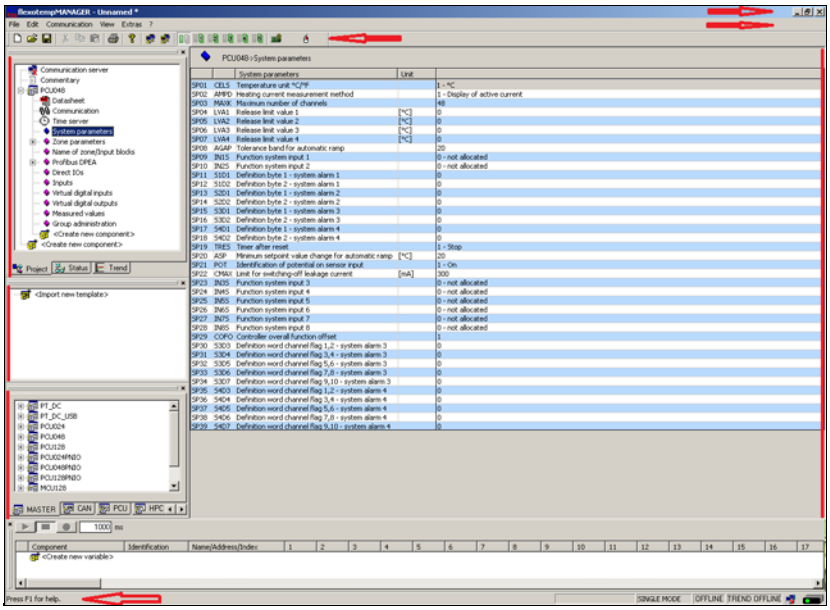
Project

Template

Components

Data recording

Status bar



Header

Menu bar

Selection dependent content

The views can be switched on and/or off by menu item <View> in the menu bar. Each view (except status bar) can be positioned to any position on the operator interface per drag&drop.

4.1 Header

The name of the active project is displayed in the header, to the right of the program name.
If no project has been created, i.e. there is no file in
Installation directory → flexotempMANAGER → PROJECTS
then the project is entitled <Unknown> in the header.

Once project <Unknown> has been modified the project name will change to <Unknown *>. Upon exiting project <Unknown *> the user will be asked whether or not to save the changes.

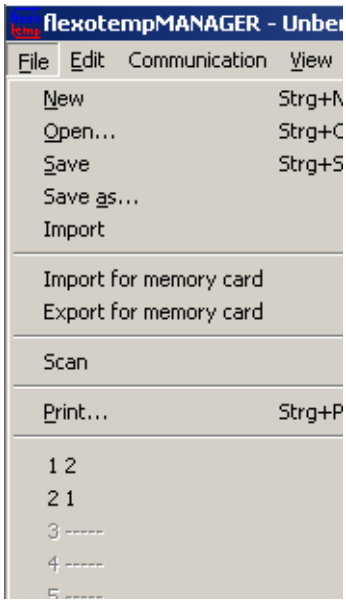
Key combinations are available, aside from menu items, that allow for an accelerated work flow. The possible key combinations are behind the menu items.

4.2 Functions of the menu bar

Functions are called, activated, and deactivated via the menu bar and the symbol bar (selected functions).
The status of specific functions is displayed in the menu bar, the symbol bar, and the status bar.

4.2.1 Menu Bar: File

Menu bar → <File>



These menu items are offered.

New or

A new project named <Unknown> is created. The |Project| window includes the communications server (PSGCommServer); its settings as well as the menu item <Create new component> are displayed in the corresponding window.

If a project was previously active the user is asked whether or not the project is to be saved.

Open or

XML files saved under
Installation directory → flexotempMANAGER → PROJECTS
are offered in a list and can be uploaded into flexotempMANAGER.

Menu bar → <File>

Save or

flexotempMANAGER administered projects are saved under the same project name in XML format.

If the project name is <Unknown *> the filename will be queried and the <Save as...> menu opens.

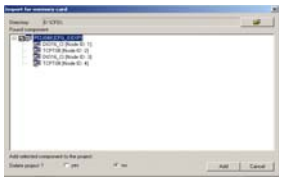
Save as...

The flexotempMANAGER administered project is saved under the project name that is provided under file name.

Import

XML files, where projects are defined, can be imported into the fle-xotempMANAGER. Is a separate validation program used, the file fm.xsd is available and/or the validation is executed during import. With the help of plain-text messages the operator can easily analyze and remove errors /warnings.

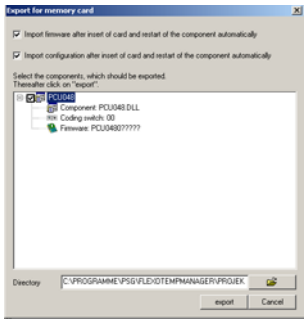
Import for memory card



The import function allows import of memory card compatible projects into a project. The data is saved on a path from where they can be read into a project.

Please see the the operating manual for temperature control system flexotemp® , system structure & project planning (chapter on memory cards) for further details.

Export for memory card

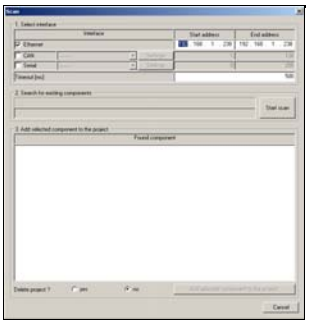


The export function allows the conversion of projects into memory card compatible projects. The data is saved on a path from where they can be copied onto a memory card and/or directly copied to a memory card..

Please see the the operating manual for temperature control system flexotemp® , system structure & project planning (chapter on memory cards) for further details.

Menu bar → <File>

Scan



This dialogue allows for the scanning of all controllers connected to the system (see chapter ↗Examples of Use).

Possible interfaces are Ethernet, CAN, and the serial interface. The controllers to be scanned are determined by entering beginning and end address. The controllers are scanned in sequence of their addresses.

Default settings for the respective interface are:

- CAN: Baudrate 250kBit
- Serial: Baud rate: 19.2k Baud, No Parity, 2 Stop bits

and can be altered via the <Settings> key.

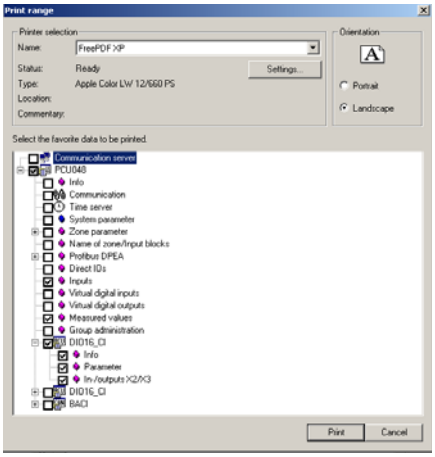
The found components are listed. Upon selecting components with ☑ these can be added to an existing project

(Delete Project? no), respectively instead (Delete Project? yes) be uploaded into the window.

If the scan returns component errors (e.g. node guarding error) the data is not retrieved.

Print or

All components in the |Project| window are reflected here. By ☑ selected project tree data is printed. System printers are offered in a list.



A notification appears if no printer is installed.

1-----
2-----
3-----
4-----
5-----

The last 5 projects retrieved from <File> <Open> are saved here:
Installation directory → flexotempMANAGER → PROJECTS

Choosing one of the 5 projects allows for a quick change among projects.

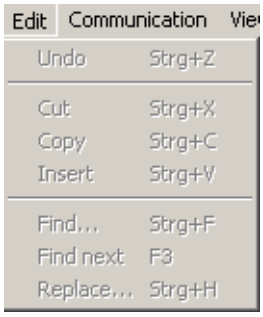
Close

flexotempMANAGER is closed via this menu item.

4.2.2 Menu bar Edit

The gray displayed menu items are currently not supported by flexotempMANAGER

Menu bar → <Edit>



These menu items are offered.

Undo	The previously executed command (e.g. copy) is undone.
Cut or	The objects selected with the cursor are cut. The objects are deleted from their previous location, but they still remain saved internally (e.g. to paste).
Copy or	Objects selected with the cursor are copied. The objects remain in their previous location and, additionally, they are saved internally (e.g. to paste).
Paste or	Objects saved internally (e.g. from cut or copy) are pasted in the location marked by the cursor.
Search	The entered term is searched for. (Only in window |Project| <MCU/PCU> <Zone name/Input blocks>, see chapter ↗Menu Bar Extras)
Continue search	The entered term is searched for. (Only in window |Project| <MCU/PCU> <Zone name/Input blocks>, see chapter ↗Menu Bar Extras).
Replace	The entered term is searched for and replaced by another entered term. (Only in window |Project| <MCU/PCU> <Zone name/Input blocks>, see chapter ↗Menu Bar Extras).

4.2.3 Menu bar communication

Functions pertaining to the communications between flexotempMANAGER - communications server - controllers are categorized under this menu item.

The menu items can be selected individually to individually control data throughput, which is rather large during trend recording.

Menu bar → <Communication>

These menu items are offered.

online

Menu item <online> initiates the connection between flexotempMANAGER and the controllers of the project via the communications server.

Selection

Menu bar

Menu item <online> is marked as active by ☑.

Symbol bar

The LAN connection symbol is pressed (=active).

Display

Status bar

- Change of display color OFFLINE to ONLINE in green
- Blinking LAN connection symbol (flexotempMANAGER connection to PSGCommServer) during data access occurred
- Yellow LED (Connection status interface to controller)

Communication server side

The communications server shown in the selection-dependent window displays in connection status <online – Server Connection o.k.> and under server connection, hyphen, slash, and back-slash are alternating in the display.

Menu bar → <Communication>

Trend online

Menu item <Trend online> initiates the connection between flexotempMANAGER and the controllers of the project via the communications server.

Selection

Menu bar

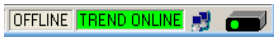
Menu item <Trend online> is marked as active by ☑.

Symbol bar

The LAN connection symbol for trend is pressed (=active).

Display

Status bar



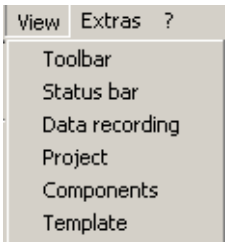
- Change of display color TREND OFFLINE to TREND ONLINE in green
- Blinking LAN connection symbol (flexotempMANAGER connection to PSGCommServer) during data access occurred
- Yellow LED (Connection status interface to controller)

Further information on Trend see chapter ↗Trend.

4.2.4 Menu bar View

Task-oriented, the user may activate / deactivate windows via the menu bar <View> to have a more organized view.

Menu bar → <View>



These menu items are offered.

Default view arrangements see chapter ↗User Interface Segmentation.

Symbol bar

Menu item <Symbol bar> is marked as active by ☑. The symbol bar is displayed. See chapter ↗Functions of the symbol bar.

Status bar

Menu item <Status bar> is marked as active by ☑ . The status bar is displayed.

Data recording

Menu item <Data recording> is marked as active by ☑ and the corresponding window is displayed.
See chapter ↗Data recording.

Project

Menu item <Project> is marked as active by ☑ and the corresponding window is displayed.
See chapter ↗Project.

Component

Menu item <Components> is marked as active by ☑ and the corresponding window is displayed .
See chapter ↗Components.

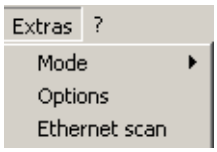
Template

Menu item <Template> is marked as active by ☑ and the corresponding window is displayed.
See chapter ↗Template.

4.2.5 Menu Bar Extras

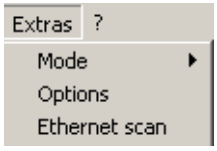
The entry mode for parameters is adjusted and options can be activated / deactivated via menu item <Extras>. The Ethernet-scan identifies all controllers connected to the network via UDP protocol.

Menu bar → <Extras>



These menu items are offered.

Mode



Aside from changing individual parameters of individual zones, in so-called SINGLEMODE, zones can be grouped to input blocks. If a parameter of a zone is changed the same parameter changes for the zones in the input block. This is the so-called block mode.

It simplifies zone-wide parameter input.

Single mode (default) and 5 input blocks for pre-definition are available.

Zone-to-input block allocation occurs in the |Project| <MCU/PCU> <Zone name/Input blocks> window.

Mode settings apply per controller in the project.

PRIOR to data input, the mode is to be selected and then the parameter be changed.

A changed parameter of a zone is also changed for the zones selected in the input block.

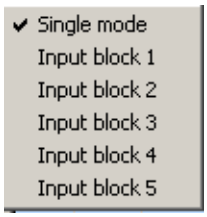
Input blocks can be renamed in the |Project| window under <MCU/PCU> <Zone name/Input blocks> (Function menu bar → <Edit> Find/Replace see chapter ↗Menu bar Edit here possible). The new names will be shown in all relevant places in the program.

The default names are used in this description.

Mode

Selection

Menu bar



Selecting menu item <Mode> opens another selection menu in which the input blocks can simply be selected from a list.

One mode must always be selected.

The selected mode is marked by ☑.

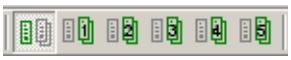
Menu bar → <Extras>

Mode

Symbol bar

Single mode selected

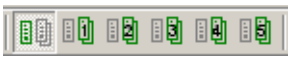
Input block 1 selected.



Input block 2 selected.

Input block 3 selected.

Input block 4 selected.



Input block 5 selected.

Mode

Display

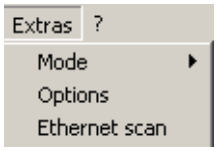
Status bar

The status bar displays the name of the selected input block, for example input block 2.

Menu bar → <Extras>

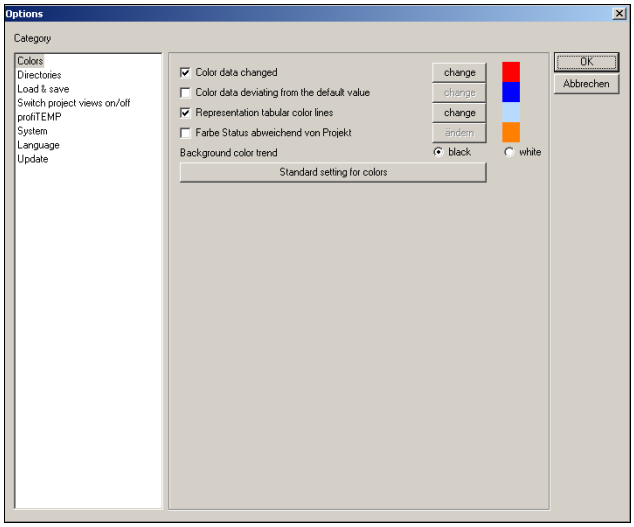
Options

When selecting menu item <Options> another selection menu opens.



Options

Colors



Different display colors mark data whose value has been changed or differs from the default value, etc.. The display colors can be individually adjusted and if necessary reset to default settings.

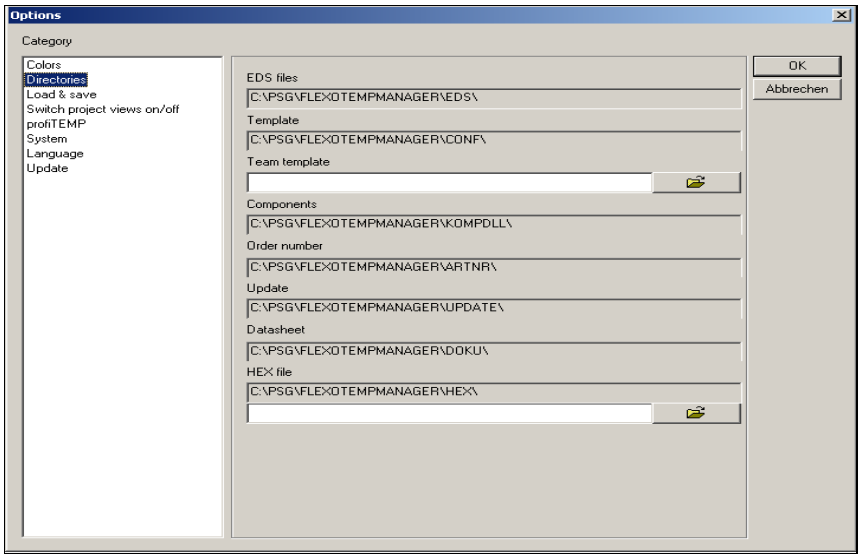
Menu item <Colors Rows Data tables> adjusts the colors of the rows of data tables in the selected window.

The menu item <Color when status deviates from project> displays parameters which deviate between project and status in the color set here.

Menu bar → <Extras>

Options

Directories



The directories show where data is physically saved on the computer. Such data cannot be altered, except for the work group templates and HEX-Files.

HEX-File

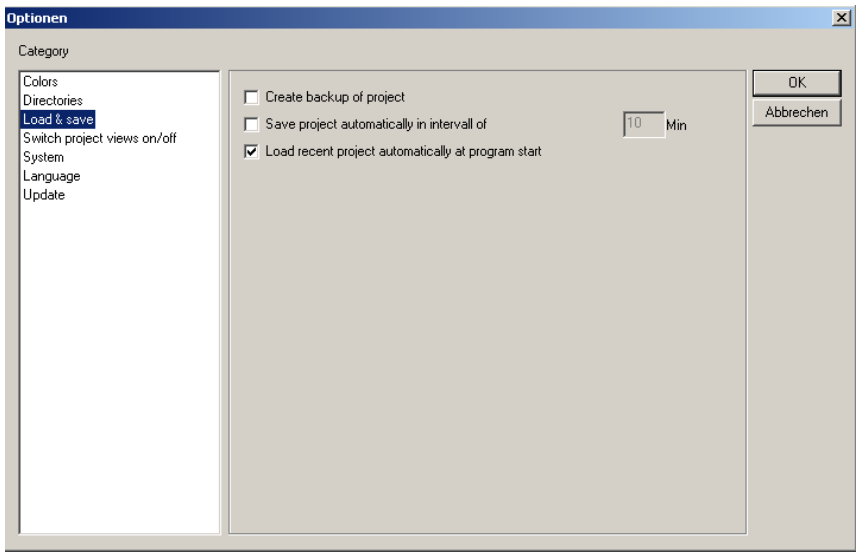
The path can be selected for HEX-Files, where the HEX-Files are chosen for the functions software version and firmware update.

Is in the open project a subdirectory HEX existing, this is used as path for function software version and firmware update.

The update of HEX-Files by <Extras> <Options> <Update> works still with the directory "..\flexotempMANAGER\HEX".

Options

Load & Save



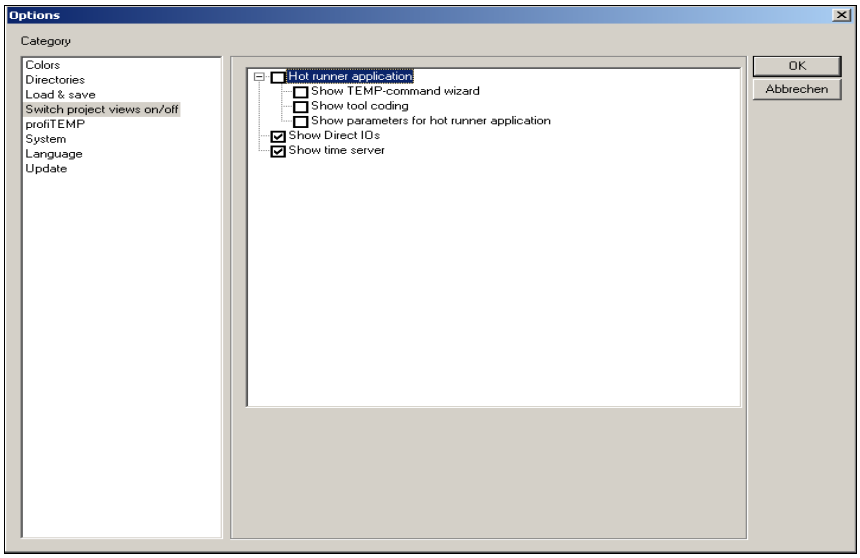
Project load & save settings can be adjusted here.

Technical changes reserved

Menu bar → <Extras>

Options

Activate / deactivate project views



Project view can be adjusted for controllers indicated here.

For hot runner applications, the following controller relevant data can be displayed:

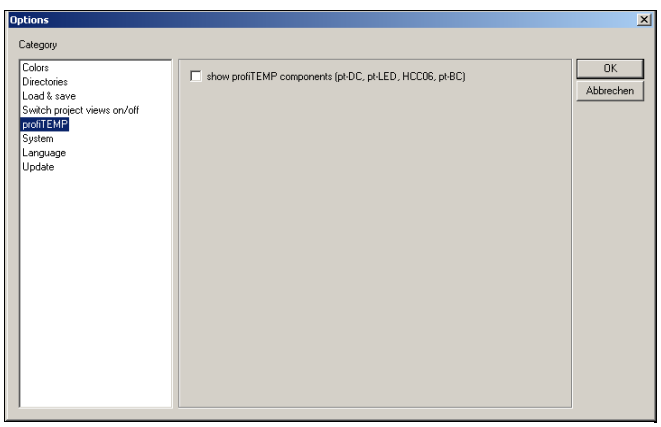
- TEMP-Command-Wizard in the symbol bar
(see chapter ↗TEMP-Command Wizard)
- tool codes in the project
- additional parameters for hot runner applications

Direct IOs — direct IO's in the project (see chapter ↗Direct IOs).

Time Server — Time server in the project below the master component (see chapter ↗Time Server).

Options

profiTEMP



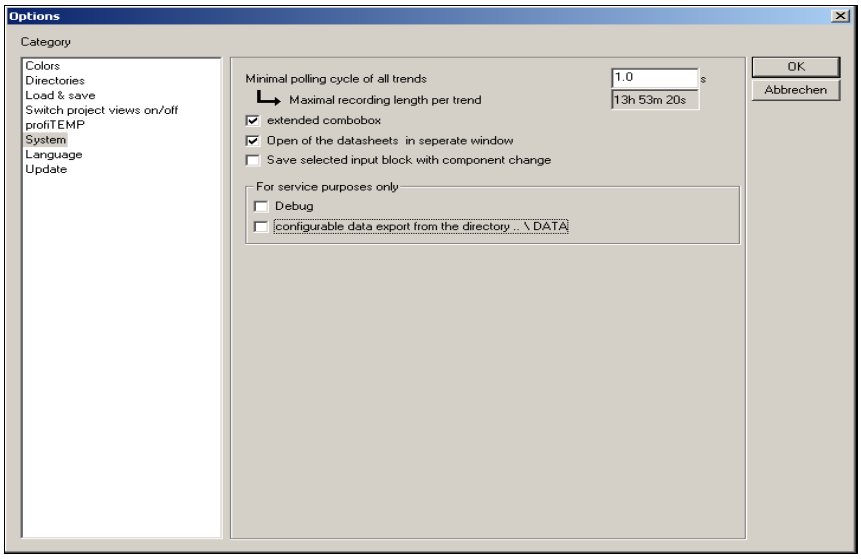
Shows components of hot runner controller profiTEMP. For further details see documentation of profiTEMP.

At new installation automatically set (from software version 1.3.4)

Menu bar → <Extras>

Options

System



Combo box

There are two types of combo boxes for the presentation of system parameter and parameter selection lists in flexotempMANAGER. The setting for which type is to be used occurs here. The extended combo box is active in default settings.

Data sheets...

According to the settings here, the data sheets are directly shown in flexotempMANAGER or in a separate window.

... input block ...

The selected input block is saved with change of component.

For service purposes only

flexotempMANAGER can be started in debugging mode for error analysis. Additional information is displayed for individual components. For trend readings, a polling cycle for 1.0 to 60.0 seconds can be entered. The shorter the cycle time the shorter the recording time.

The settings for debug and polling will only become active upon restarting the program.

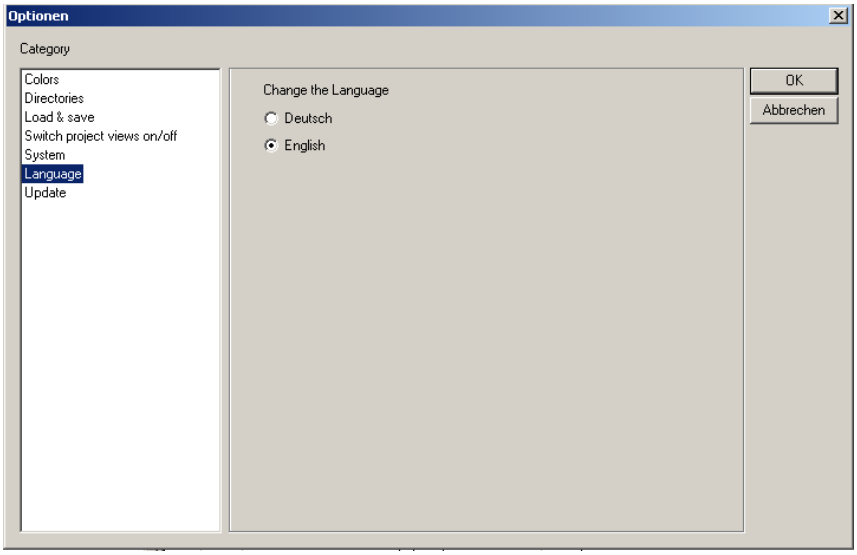
For service purposes only

By a XML-File in the directory ...\DATA a function can be activated to read values of components in a project. The XML-File must be defined accordingly.

Menu bar → <Extras>

Options

Language



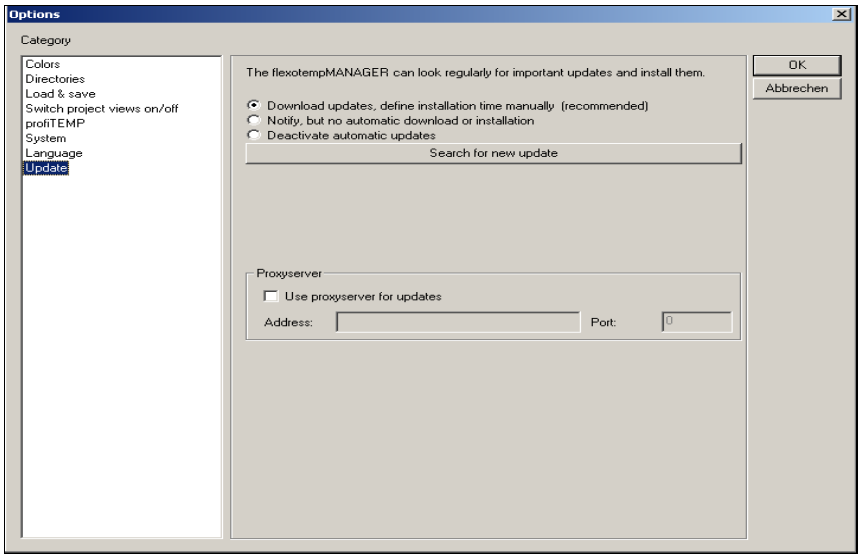
Text language on the user interface can be switched in <Language>.

Settings here will only become active upon restarting the program.

Menu bar → <Extras>

Options

Update



We continuously further develop and improve our PSG products and make available online updates for:

- flexotempMANAGER software
- corresponding operating manuals
- controller software in HEX-Files
- Data sheets for components

via Internet.

flexotempMANAGER can be configured to download updates automatically or to wait for manual user input.

Proxy server

Connection to Internet by

- entry in registry
- as direct connection
- by entry of Proxy Server (manual data entry possible)

Is the connection to the Internet missing, the message: „Cannot connect to update server“ is displayed.

Display

Status bar

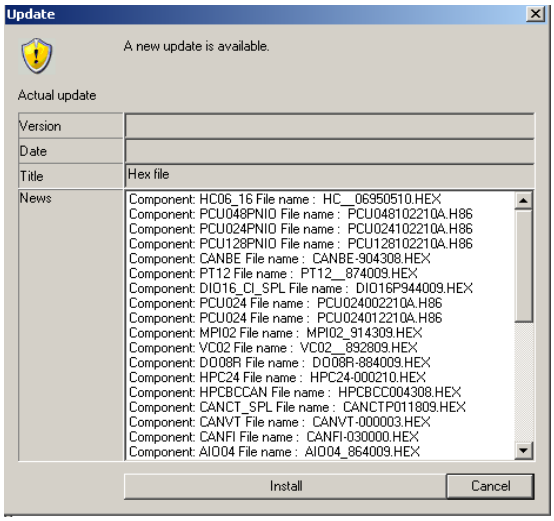
If <Download update …> is active a status bar (blue) indicates progress and it is displayed how many files have been downloaded (e.g. 1 of 2).

Technical changes reserved

Symbol bar

Once updates are ready for installation the symbol for <Updates available> is shown in the status bar.

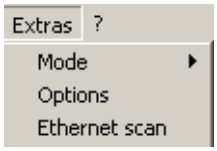
By selecting the symbol and/or after checking at flexotempMANAGER start-up, a window where the installation of updates can be initiated opens.

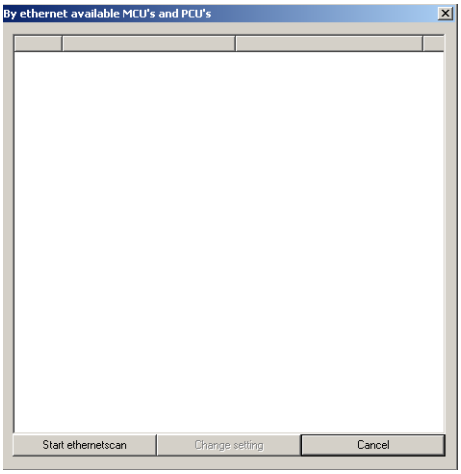


Menu bar → <Extras>

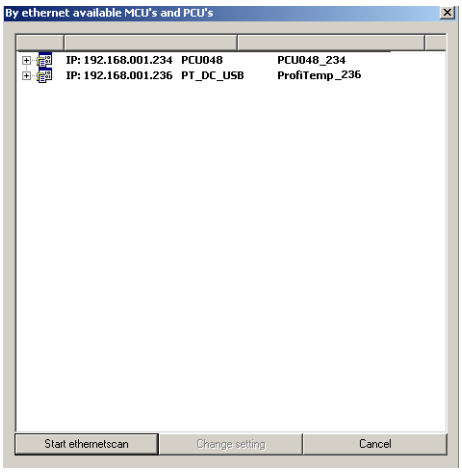
Ethernet scan

A dialogue box opens when selecting menu item <Ethernet scan>.





Upon initiating <Ethernet scan>, all controllers connected to the network via UDP protocol are identified and, if recognized, displayed independent of their IP range (see chapter ↗Communication concepts of flexotempMANAGER).



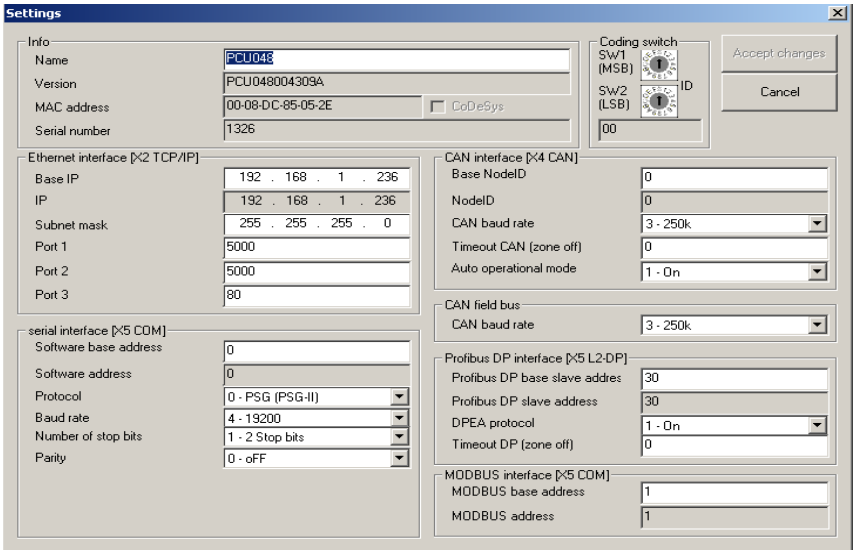
Is only one controller listed, the detail information is shown immediately. Otherwise an entry in the list must be selected per double click to show the detail information.

The detail information comprises among other things software version, interface settings, etc.

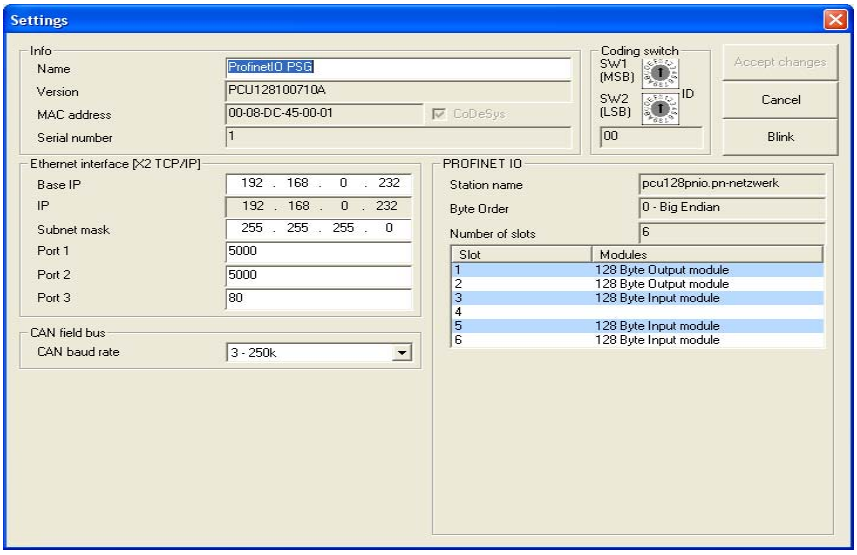
Settings, such as Base IP, for example, can be altered here to adjust the controller to the address range of its network.

Menu bar → <Extras>

Ethernet scan
For master component
WITHOUT abbreviation PNIO



Ethernet scan
For master component
WITH abbreviation PNIO

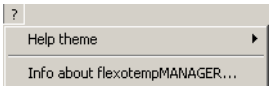


Selecting menu item <Blink> causes the controller to synchronize the blinking of status LED's. This facilitates identification of a specific controller installed in a control cabinet together with many other control cabinets (Deactivate via menu item <Stop blink>).

4.2.6 Menu bar ?

This menu point offers help to the user.

Menu bar → <?>



These menu items are offered.

Help topics

Contents of the operating manuals on the following subjects

- Operation
- Parameters
- System configuration & project setup

are displayed (further documentation see chapter ↗Additional and continuative documents).

Info on flexotempMANAGER

or

Displays current software version of flexotempMANAGER in

flexotempMANAGER V n.mm.pp/jjmmtt

format.

<F1>

Key <F1> displays manual (Project Setup and Configuration Tool flexotempMANAGER Operation)

4.3 Functions of the symbol bar

Functions are called or activated / deactivated via the symbol bar.

The status of individual functions is displayed in the menu bar, the symbol bar, and in the status bar.

Functions described here are only available in the symbol bar. Menu bar redundant functions are described in ↗Functions of the menu bar.

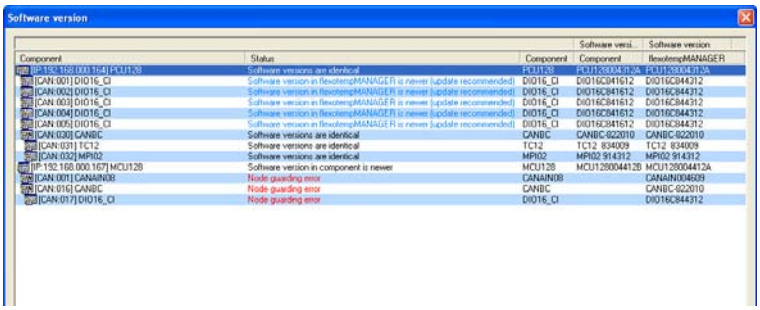
4.3.1 Software version

Symbol bar →

Software version

All components grouped in a project are listed here by their

- Names, current interface address
  (Master [IP:x.x.x.x], [CAN:x] and/or [COM:x] for CAN- and PCU-Slaves [CAN:x] and for PSG-Slaves [PSG:x])
- Status
- Component
- Software version of component
- Software version of flexotempMANAGER



Status

Software identical

The current component hex-file matches the most recent hex-file in memory of flexotempMANAGER.

Action: None

No Hex-File available

No hex-file for the component in flexotempMANAGER available.

Action: See ↗Menu Bar Extras → Options → Update

Software version in component newer

The hex-file for the component is newer than in flexotempMANAGER.

Action: None or See ↗Menu Bar Extras → Options → Update

Software version in flexotempMANAGER is newer (Update recommended)

A newer hex-file in flexotempMANAGER available.

Action: None or „update“

The button <Start firmware update of the selected component> becomes selectable (black lettering) when no error message (red) is existing.

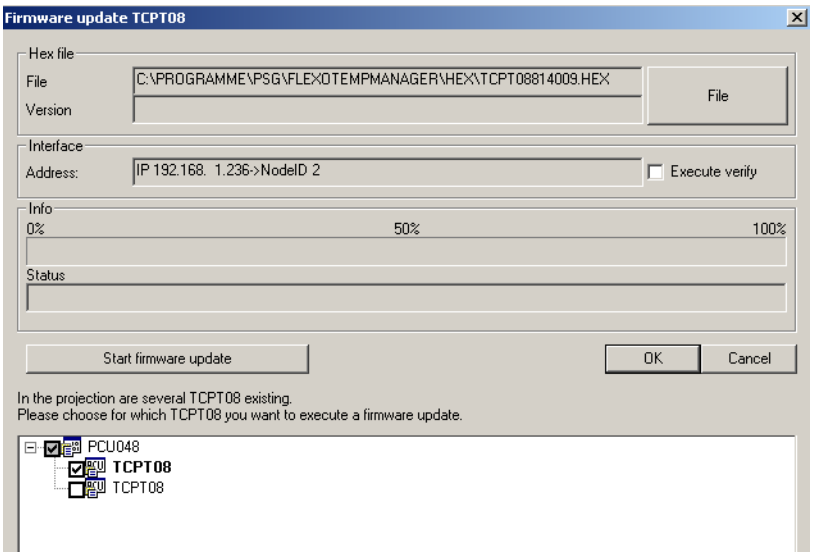
A red entry appears under software version indicating

- Set communication for this component out of service - Communication to MCU/PCU was taken out of service
- Communication error - MCU/PCU cannot be reached
- Different project setup - Project setup different between flexotempMANAGER and connected components
- Another component connected - Another component than in project setup connected
- Node guarding error - Programmed component missing

Symbol bar →

Software version

Carry out firmware update of selected component



The most current hex-file available for firmware upgrade is displayed.

Another hex-file previously saved on the computer can be selected via the <File> button.

All components of the same type in the project (example here: TCPT 08) are listed and are update by placing a check ☑.

If a ☑ Verify is executed, the hex-file will be uploaded to the controller. In flexotempMANAGER and in the controller it is verified that both hex-files are identical. Only then the controller EEProm accepts the file and the controller is restarted. Without Verify there is no verification prior to copying to EEProm. Verify is recommended (doubles update time).

Upon selecting the right hex-file and the components to be updated the function needs to be activated via <Start firmware update>.

4.3.2 ARP (Address Resolution Protocol)

Symbol bar →

ARP
AddressResolution Protocol

The Address Resolution Protocol (ARP) is a network protocol that determines a network address of the Internet layer, the physical address (hardware address) of the network access layer. This assignment is stored in so-called ARP tables of the computers involved.

It is used almost exclusively in connection with the identification of MAC addresses to IP addresses given.

(Source: wikipedia)

It happens now that there are incorrect entries in the ARP table. It can no longer be communicated with the respective host. In this case, the ARP table should be deleted, so that it can rebuild.

In addition to the automatic call from flexotempMANAGER, whenever a component is not reached, the function can also be invoked manually by the operator by this icon, without having to leave the flexotempMANAGER.

After confirmation with <OK>, the ARP table is deleted.

4.3.3 TEMP-Command Wizard

TEMP-Command is control cabinet system specifically designed for hot runner applications and built according to a fixed, corresponding structure.

A standard TEMP-Command system is easily planned and configured via this selection point. The selection point is only visible if the function was previously activated.

(see menu list → <Extras> <Options> <Activate/deactivate project views> <Hot runner applications>).

Symbol bar →

TEMP-Command-Wizard

A TEMP-Command system is addressed, configured, and included in the project in form of a new PCU-component through the following components:

- DIO 16 CI (Digital In-/Output Interface, Current Input) – one component
- TCPT 08 (Thermocouple Interface – only if external comparison available
- CANPC (Power Card) – Number of components according to specification
- CANTC (Thermocouple Card) – one component, 12/24 zones each

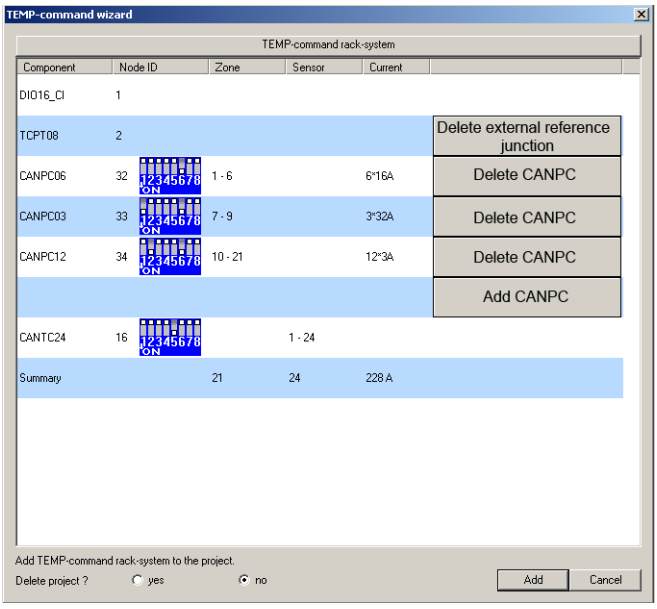
The individual components are automatically addressed and configured in project setup.

-
-

In analogy to project setup, addressing is carried out on the respective components via DIP-switch.

Add external reference junction

If copper wiring is used to connect to the sensor, a measuring point for comparison is needed. TCPT 08 (Thermocouple Interface) allows for the connection of resistance thermometer Pt100 to carry out the comparative reading.



Symbol bar →	
TEMP-Command-Wizard	Component DIO 16 CI is always present; Component TCPT 08 is added when selecting an external comparison point; <Add CANPC> offers a list from which Power Cards of the following types can be selected: ■ CANPC03 (3 zones at 32A per card) ■ CANPC06 (6 zones at 16A per card) ■ CANPC12 (12 zones at 3A per card) For every 12/24 zones one component CANTC 12/24 is added.

4.3.3.1 Default addressing of components

By using the TEMP-Command-Wizard addresses are automatically allocated to the newly created PCU-component and its components in the project.

Default addressing of components with TEMP-Command-Wizard	
Component DIO 16 CI	NodeID = 1
Component TCPT 08	NodeID = 2
Component CANTC **	NodeID = 16 and up (until 31)
Component CANPC **	NodeID = 32 and up (until 67)

Up to 128 zones can be configured.

4.3.3.2 Default configuration of the components

Using the TEMP-Command-Wizard automatically configures the newly created PCU component and their components in the project.

Default configuration of the components with TEMP-Command-Wizard

Controller - Communication	Ethernet	Base-IP: 192.168.0.220 (Standard)
Controller - System parameter	[SP03] MAXK	Depending on CANPC ports; one port each is allocated to one zone.
	[SP09] IN1S=4	If a signal is active on system-digital port 1, the function defined here is executed for the entire system. A reduction relative by the 2. setpoint value is carried out for all zones, equals standby function.
	[SP10] IN2S=8	If a signal is active on system-digital port 2, the function defined here is executed for the entire system. An increase relative by the 3. setpoint value is carried out for all zones, equals boost function.
	[SP11] S1D1=15	This parameter defines which event triggers system alarm 1. ■ Thyristor alarm (TA) (1_{dec}) ■ Current Tolerance Alarm (CTA) (2_{dec}) ■ LI1 (storing by LI1D) (4_{dec}) ■ LI2 (storing by LI2D) (8_{dec}) The setting value for the parameter is presented in decimal notation and it is the sum of all setting values, e.g. $1_{dec} + 2_{dec} + 4_{dec} + 8_{dec} = 15_{dec}$
	[SP12] S1D2=226	This parameter defines which event triggers system alarm 1. ■ Sensor break (tCb)/sensor incorrect polarity (tCp)/ sensor 1 (not storing) (2_{dec}) ■ Project setup or control zone not initiated (32_{dec}) ■ System-/Channel data error (64_{dec}) ■ Error CAN / Slave error (128_{dec}) The setting value for the parameter is presented in decimal notation and it is the sum of all setting values, e.g. $2_{dec} + 32_{dec} + 64_{dec} + 128_{dec} = 226_{dec}$
	[SP19] TRES=2	The Timer is stopped, reset and after reset started again. A reset is triggered by a sensor break, setpoint value at zero, or a zone passivation.
	[SP20] ASP=20	For zones with an active automatic ramp function, the automatic ramp is started for setpoint value changes greater than 20K.
	[SP23] IN3S=17	If a signal is active on system-digital port 3, the function defined here is executed for the entire system. All zones are passivated.

	[SP24] IN4S=146	If a signal is active on system-digital port 4, the function defined here is executed for the entire system. Input block active in software TEMP-Soft (inverted), equals enable signal from machine control.

Default addressing of components with TEMP-Command-Wizard

Controller inputs	System Input = 1 ***DIO16_CI.DIO1	Digital port 1 of DIO 16 CI is used as signal for system parameter [SP09].
	System Input = 2 ***DIO16_CI.DIO2	Digital port 2 of DIO 16 CI is used as signal for system parameter [SP10].
	System Input = 3 ***DIO16_CI.DIO3	Digital port 3 of DIO 16 CI is used as signal for system parameter [SP23].
	System Input = 4 ***DIO16_CI.DIO4	Digital port 4 of DIO 16 CI is used as signal for system parameter [SP24].
Controller - Measured Values	Zone 1 = ***CANTC12.AI1… etc. and/or Zone 1 = ***CANTC24.AI1… etc.	The analog ports of sensor cards are continually allocated, in 12/24-step increments, to the measured values of controllers in zone 1.
Controller - Tool Coding	Tool coding Bit 0 ... 7 is set to ***DIO16_CI.DIO9... ***DIO16_CI.DIO16	The Wizard has allocated the digital ports of the DIO 16 CI module to tool code bit 0...7. The user can manually change the allocation here.

Default addressing of components with TEMP-Command-Wizard

DIO 16 CI Module In-/outputs

In-/output DIO 01 = ***DIO16_CI.DIO01	The digital port provides a signal for system-digital port 1 (see [SP09] IN1S - standby function)
In-/output DIO 02 = ***DIO16_CI.DIO02	The digital port provides a signal for system-digital port 2 (see [SP10] IN2S - boost function)
In-/output DIO 03 = ***DIO16_CI.DIO03	The digital port provides a signal for system-digital port 3 (see [SP23] IN3S - all zones are passivated)
In-/output DIO 04 = ***DIO16_CI.DIO04	The digital port provides a signal for system-digital port 4 (see [SP24] IN4S - enable signal for machine control)
In-/output DIO 05 = ***DIO16_CI.DIO05	Digital port to which <system alarm 1 inverted> is connected The signal is used as <enable machine inverted>
In-/output DIO 06 = ***DIO16_CI.DIO06	Digital port to which <system alarm 1> is connected The signal is used as <enable machine>
In-/output DIO 07 = ***DIO16_CI.DIO07	<n.a.>
In-/output DIO 08 = ***DIO16_CI.DIO08	<n.a.>

DIO 16 CI Module In-/outputs

Tool Coding

A code from 1...255 (depending on the plugged-in bridges) for the digital input ports is sent via a plug on the tool. A recipe can be stored for each code in the control cabinet and multi loop controller software TEMP-Soft whose settings are imported upon activating the tool recognition function.

In-/output DIO 09 = ***DIO16_CI.DIO09	Digital input port for tool coding 0 (LSB)
In-/output DIO 10 = ***DIO16_CI.DIO10	Digital input port for tool coding 1
In-/output DIO 11 = ***DIO16_CI.DIO11	Digital input port for tool coding 2
In-/output DIO 12 = ***DIO16_CI.DIO12	Digital input port for tool coding 3
In-/output DIO 13 = ***DIO16_CI.DIO13	Digital input port for tool coding 4
In-/output DIO 14 = ***DIO16_CI.DIO14	Digital input port for tool coding 5
In-/output DIO 15 = ***DIO16_CI.DIO15	Digital input port for tool coding 6
In-/output DIO 16 = ***DIO16_CI.DIO16	Digital input port for tool coding 7 (MSB)

TCPT 08 Module **External reference junction** **System Parameters**	SEN1 (sensor type)	This sensor type is pre-set with <PT100> and applies to analog input ports 1...4.
	SEN2 (sensor type)	This sensor type is pre-set with <PT100> and applies to analog input ports 5...8.
TCPT 08 Module **In-/outputs**		A resistance thermometer Pt100 can be connected to one of the 8 ports. If using SPS programming, a CoDeSys variable can be entered here that the program can address then.
CANPC ** Module **Outputs**		Available output ports are pre-set with zones from 1 onwards. If using SPS programming, a CoDeSys variable can be entered here that the program can address then.

Default addressing of components with TEMP-Command-Wizard

CANTC ** Module System Parameters	SEN1 (sensor type)	This sensor type is pre-set with <FE-J> and applies to sensor input ports 1 … 6 (CANTC 12 and/or CANTC 24). If a comparison exists it is displayed after the sensor type.
	SEN2 (sensor type)	This sensor type is pre-set with <FE-J> and applies to sensor input ports 7 … 12 (CANTC 12 and/or CANTC 24). If a comparison exists it is displayed after the sensor type.
	SEN3 (sensor type)	This sensor type is pre-set with <FE-J> and applies to sensor input ports 13 … 18 (CANTC 24). If a comparison exists it is displayed after the sensor type.
	SEN4 (sensor type)	This sensor type is pre-set with <FE-J> and applies to sensor input ports 19 … 24 (CANTC 24). If a comparison exists it is displayed after the sensor type.
		For each input port SEN 1...4 it is displayed via which component an available external comparison is connected. It is described by NodeID, component name, and input port.
CANTC ** Module Inputs		The analog input ports of the CANTC** module are configured on the controller under measured values (see controller - measured values). If using SPS programming, a CoDeSys variable can be entered here that the program can address then.

4.3.4 Simulated secondary mouse button

The secondary mouse key to open up selection menus can be simulated one time when using touch screen.

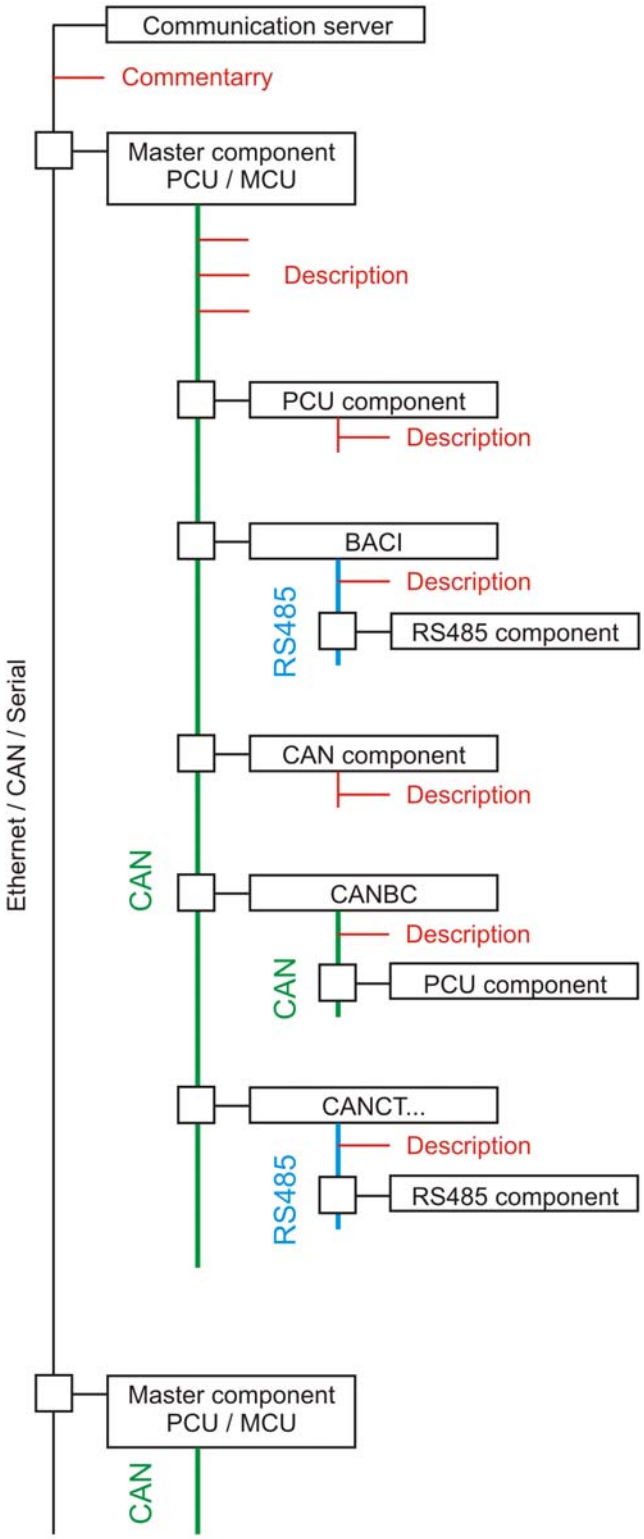
Symbol bar →

Simulated secondary mouse button		Example: Select component via primary mouse key → Select symbol → Select component via primary mouse key → the respective selection menu is activated.

5 Project

The following tasks can be executed in project view.

5.1 Create projects



Menu bar → <View> <Project>, Register <Project>

Show project

flexotempMANAGER works project oriented.

The following entries that are grouped to one project are shown / can be connected in the |Project| window below the communication server:

- Controller and open loop control units
- CAN components (bus coupler modules, I/O modules)
- PCU components (bus coupler modules, I/O modules)
- RS485 components (I/O modules PSG output bus)

(see chapter ↗Commentary for project)

A project description is generated through

- commentary (see chapter ↗Commentary for project)

a description of the components is generated through

- Data sheet
- Operating instructions (when existing)
- Parameter for specification
- Communication (only for controllers)
- Time server (only for controllers)
- In-/outputs

A change between projects is done by

- <File> <New> or
- <File> <Open> (select a saved project from disk) or
- 1_____ etc. (select a stored on disk and already once opened project in flexotempMANAGER (see chapter ↗Menu Bar: File)

New components can be created via

- Selection item <Create new component> in project
- <Component> view per drag&drop
- From <Template> view and transfer of entire project

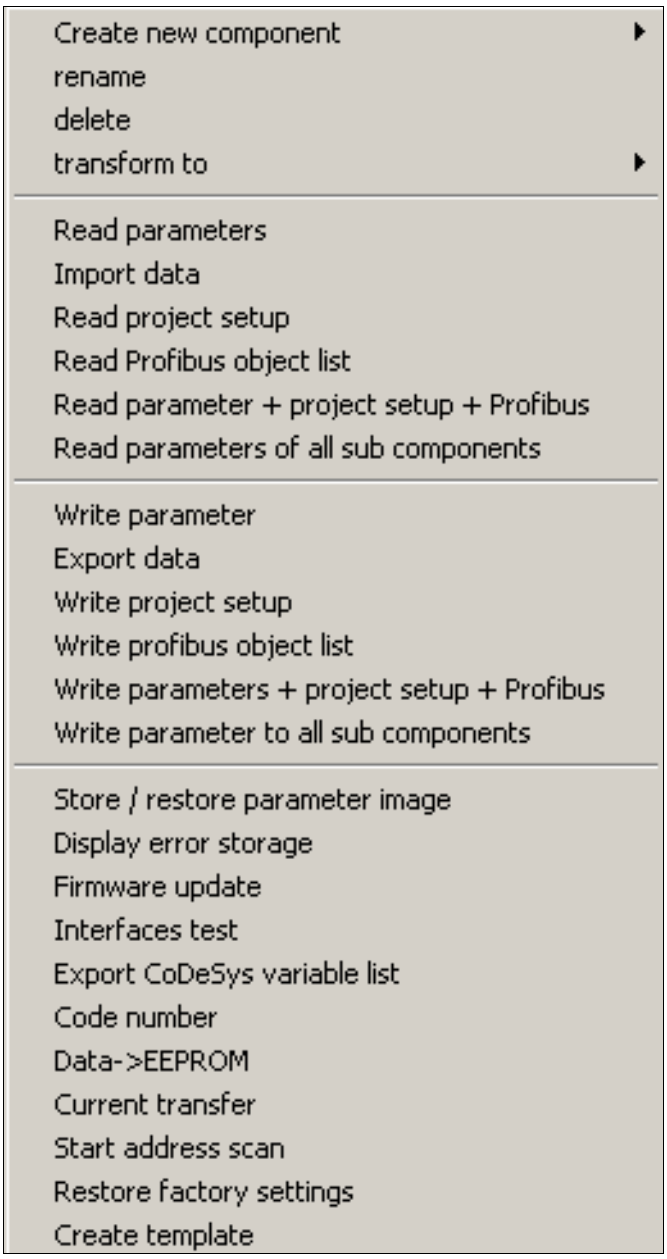
After creation of a project or after modification, the components may need to be configured (for further documentation see chapter ↗Additional and continuative documents)

5.1.1 Context menus on project level

At the project level, a menu can be called for each component via the secondary mouse key. Further functions can be called via this menu.

Selected context menus with the array of functions described below are available in the status menu.

5.1.1.1 Context menu for master components



Master Components	MCU/PCU

Create new component

flexotempMANAGER offers those components that can be suitably integrated here.

rename

The default build-group or component name can be renamed.

delete

The selected build-group or component can be deleted from the project upon confirmation.

transform to

A projected master component can be transferred to another master component via the menu point <transform to...>.

If the transformation is from smaller to larger components, the additional zones will be given default values.

If a larger component is transformed to a smaller component, the following applies:

Transform to PCUXXX: (XXX=024 respectively 048)

- If default values apply to the parameters over zone XXX and no zone is allocated over XXX in project setup, the following query appears:

  Transform build-group <Name> to PCUXXX?

- If no default values apply to the parameters over zone XXX and no zone is allocated over XXX in project setup, the following query appears:

  Parameters from zone XXX+1 will be lost for the component.

  Transform build-group <Name> to PCUXXX?

- If default values apply to the parameters over zone XXX and a zone is allocated over XXX in project setup, the following query appears:

  Project setup data from zone XXX+1 will be lost for the component.

  Transform build-group <Name> to PCUXXX?

- If no default values apply to the parameters over zone XXX and a zone is allocated over XXX in project setup, the following query appears:

  Parameters and project setup data from zone XXX+1 will be lost for the component.

  Transform build-group <Name> to PCUXXX?

A projected master component can only be transformed to the MCU 128 master component if no I/O components, such as DIO 16 CI or TCPT08, etc. are allocated.

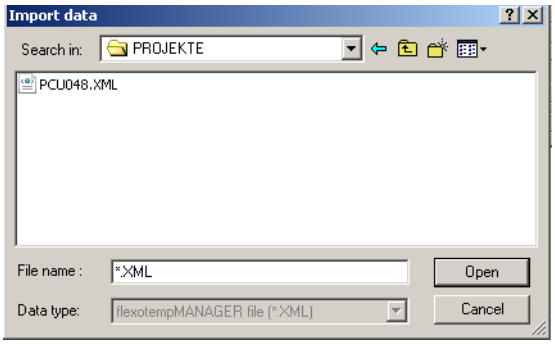
Master Components	MCU/PCU

Read parameter

Parameters (all values, like zone -, system -, communication parameters, time server and model) of the selected components (and sub-components upon confirmation) will be read from the connected controller system and imported into the project.

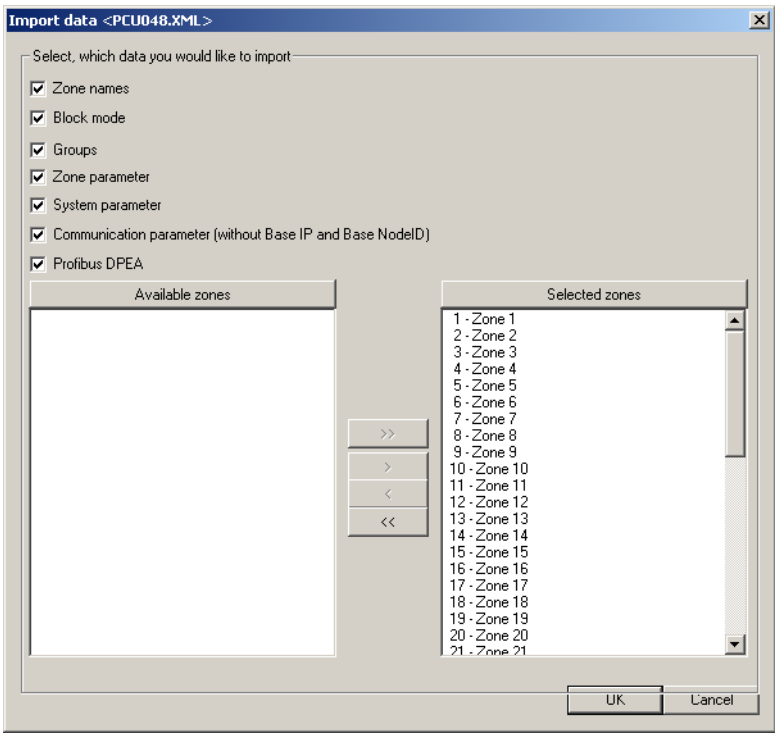
Import data

A project can be selected and its data be imported.



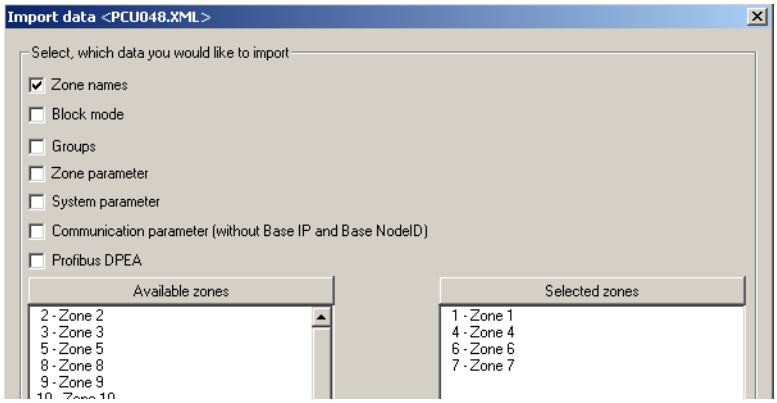
It can be specified, upon project selection, which data is to be imported from the selected project and from/for which zones. Default setting is all data for all zones.

The selected data is replaced at the selected master component.



Example: Zone names of zones 1, 4, 6, and 7 are selected from project <PCU48.XML> to be imported to the current project into the same zones.

Import data



Read project setup

Project setup (all in- and output allocations, module lists, actual value allocation) of the selected master component is read from the connected controller system and imported into the project.

It will be explicitly queried whether the zone names are supposed to be imported as well.

Read Profibus and/or PROFINET IO Object list

Object lists created in the |Project| window with menu item <Profibus DPEA> and/or PROFINET IO settings are imported by the controller into flexotempMANAGER.

Read Parameter + Project Setup + Profibus and/or PROFINET IO

Parameters of the selected master component (and sub-components upon confirmation), project setup, and the Profibus DPEA object lists and/or PROFINET IO settings are read from the connected controller system and imported into the project.

It will be explicitly queried whether the zone names are supposed to be imported as well.

Once a master component with the abbreviation "PNIO" is selected the menus will read PROFINET IO instead of Profibus.

Read parameter of all sub components ?

Parameters (all values, like zone -, system -, communication parameters, time server and model) of all components will be read from the connected controller system and imported into the project.

Master Components	MCU/PCU

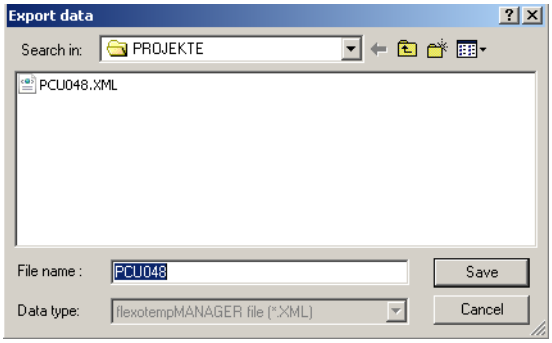
Write parameter

Parameters (all values, like zone -, system -, communication parameters, time server and model) of the selected components (and sub-components upon confirmation) are transferred from the project to the connected controller system (see chapter ↗Notifications list - Changes). For <Write parameter> <Selection> a window is displayed, where the single parameters can be selected for writing.

Export data

A project can be selected and its data exported.

The name of the selected master component (here for example PCU048) is the default file name for the data export file. The name can be changed.



The data export file contains the following data:

- Zone names
- Block mode
- Groups
- Zone Parameters
- System Parameters
- Communications parameters (except base-IP and base NodeID and software base address)
- Profibus (buffer size, object list of input and output buffer)

Write project setup

Project setup (all in- and output allocations, module lists, actual value allocation) of the selected master component is transferred from the project to the connected controller system.

A write-execution of the project setup requires a previous stopping of the master component, which will be queried.

Upon successful transfer it will be queried if the project setup is supposed to be saved.

After this, the master component is restarted, upon query (see chapter ↗Notifications list - Changes).

Write Profibus and/or PROFINET IO Object list

Object lists created in the |Project| window with menu point <Profibus DPEA> and/or PROFINET IO settings are written to the controller by the flexotempMANAGER (see chapter ↗Notifications list - Changes).

Write Parameter + Project Setup + Profibus and/or PROFINET IO

Parameters (all values, like zone -, system -, communication parameters, time server and model) of the selected components (and sub-components upon confirmation) are transferred from the project to the connected controller system (see chapter ↗Notifications list - Changes). For <Write parameter> <Selection> a window is displayed, where the single parameters can be selected for writing.

Additionally project setup and the Profibus DPEA object lists and/or PROFINET IO settings are read from the connected controller system and imported into the project.

A write-execution of the project setup requires a previous stopping of the master component, which will be queried.

Upon successful transfer it will be queried if the project setup is supposed to be saved.

After this, the master component is restarted, upon query (see chapter ↗Notifications list - Changes).

Once a master component with the abbreviation "PNIO" is selected the menus will read PROFINET IO instead of Profibus.

Write parameter to all sub components ?

Parameters (all values, like zone -, system -, communication parameters, time server and model) of all components will be transferred from the project to the connected controller system.

Master Components	MCU/PCU

Store / restore parameter image

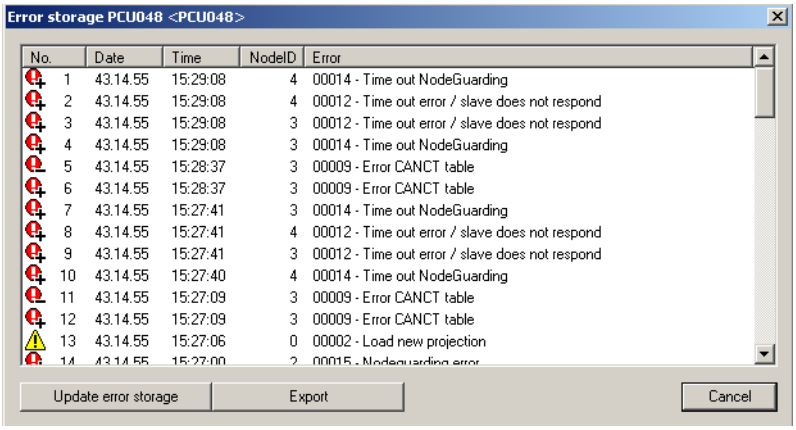
A parameter image of the sub-components is kept in the master component MCU / PCU. Before maintenance work (e.g replacement of components) a parameter image can be stored in the master component. After maintenance work the parameter image can be restored in the sub-component.

Display error memory

A maximum of 100 notifications (FIFO) are shown in the window.

Each notification is uniquely described through:

- Status/number
- Date
- Time
- NodeID
- Plain-text message



When the window is active, the current notifications are immediately displayed.

If the window is already active, subsequently occurring notifications can be visualized via menu point <Update error memory>.

Status

Message

comes

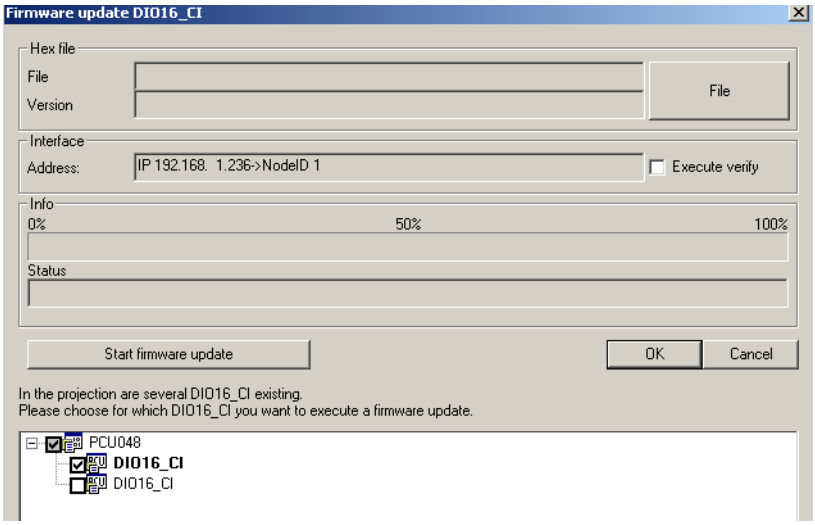
goes

The contents of the error memory are copied as a .CSV file to the projects path via menu item <Export>.

Master Components	**MCU/PCU**

Firmware update

Settings management for firmware update of the component.



The component (here DIO16CI) for firmware update is activated. A hex-file, previously copied to the processor, is selected via the <File> key.

A list from which to chose the relevant components will be displayed if there are several components of the same type.

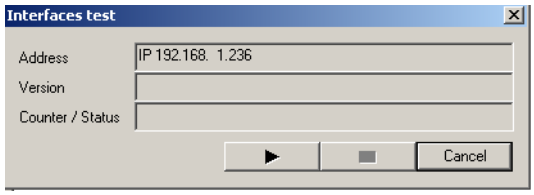
If a ☑ Verify is executed, the hex-file will be uploaded to the controller. In flexotempMANAGER and in the controller it is verified that both hex-files are identical. Only then the controller EEProm accepts the file and the controller is restarted. Without Verify there is no verification prior to copying to EEProm. Verify is recommended (doubles update time).

Upon selecting the right hex-file for the component its function needs to be activated via <Start firmware update>.

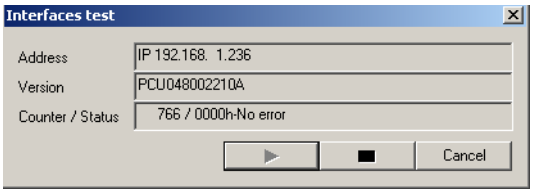
Master Components	**MCU/PCU**

Interfaces test

The interfaces can be tested via this menu item.



The interfaces test is started via .

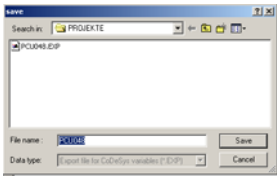


The software version of the component and the number of cycles (counter) with status is displayed.

The function is active until stopped by the user via .

Export CoDeSys variable list

All CoDeSys variables identified for component interfaces are compiled in a list and copied to an export file.
The name of the selected master component (here PCU048) is used as the default file name for the list of variables. The name can be changed.



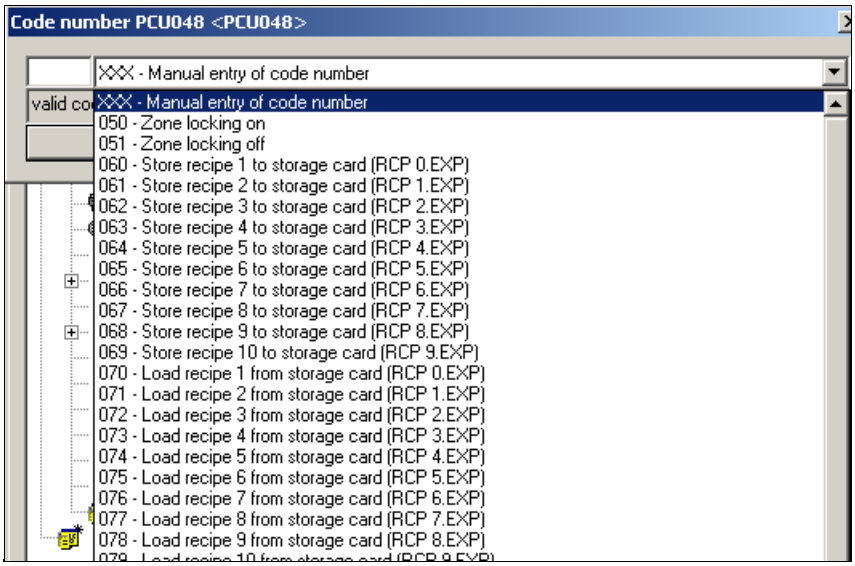
The list of variables is used to import the variables into the CoDeSys developer environment.

Master Components	**MCU/PCU**

Code number

Behind code numbers are complex system-specific or process-specific functions that simplify the handling of certain controller functions or that repair exception states in which the controller may find itself e.g. after faults or alarms. All interfaces can be activated via code numbers.

Code numbers available for the master component are displayed.



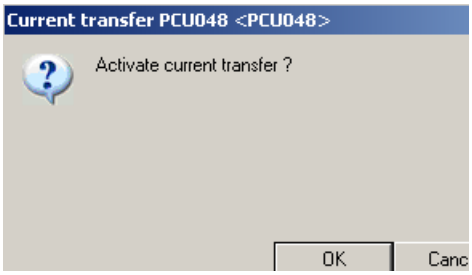
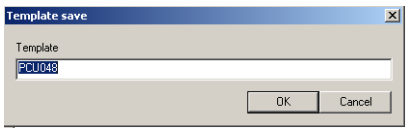
etc.

Select the favored code number out of the list, and/or select <Manual entry of code number> and enter a number between 1…900.

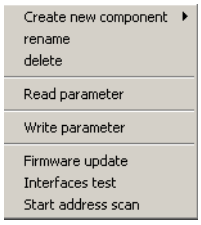
The code number is activated via <Execute code number>.

Data->EEProm

Data that is only saved to RAM is volatile and it is therefore automatically copied to EEProm after 10 minutes if there is no further alteration. Hence, data is permanently available.

Master Components	MCU/PCU
Current transfer	A current transfer is triggered at the selected master component for all zones with heating current monitoring available in the controllers if heating current monitoring is installed and correspondingly configured  Current setpoint values are overwritten with actual values. EXCEPTION: no current was measured. The previous values remain in place.
Start address scan	By the master component an address scan can be executed for all connected components.
Restore factory setting (ONLY PCU/MCU)	All parameters (SP**, CP**, P***, PROFINET, Profibus) were reset to default values. The project setup is deleted (only master component WITHOUT sub-components). From PCU/MCU software version ...4013A.
Create template	Upon selection, the master component of a current project can be copied and then used as a template in <Template> view. The name of the last selected master component (here: PCU048) is the default file name for the template. The name can be changed.  See chapter ↗Template.

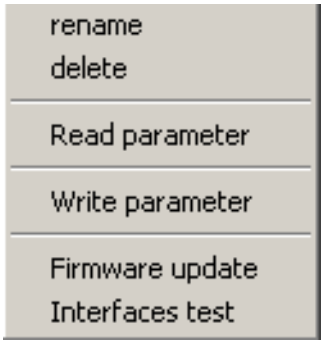
5.1.1.2 Context menu for CAN components



CAN components

Create new component	See chapter ↗Context menu for master components **Create new component** (only CANCT…, CANBC)
rename	See chapter ↗Context menu for master components **rename**
delete	See chapter ↗Context menu for master components **delete**
transform to CANCT_SPL **transform to CANCT**	The simple component can be transformed to the component with Smart Power Limitation SPL functionality and vice versa. (only for CANCT and CANCT_SPL)
Read parameter	See chapter ↗Context menu for master components **Read parameter**
Write parameter	See chapter ↗Context menu for master components **Write parameter**
Firmware update	See chapter ↗Context menu for master components **Firmware update**
Interfaces test	See chapter ↗Context menu for master components **Interfaces test**
Start address scan	Only component CANBC An address scan is triggered for the components assigned to CANBC.

5.1.1.3 Context menu for PCU components

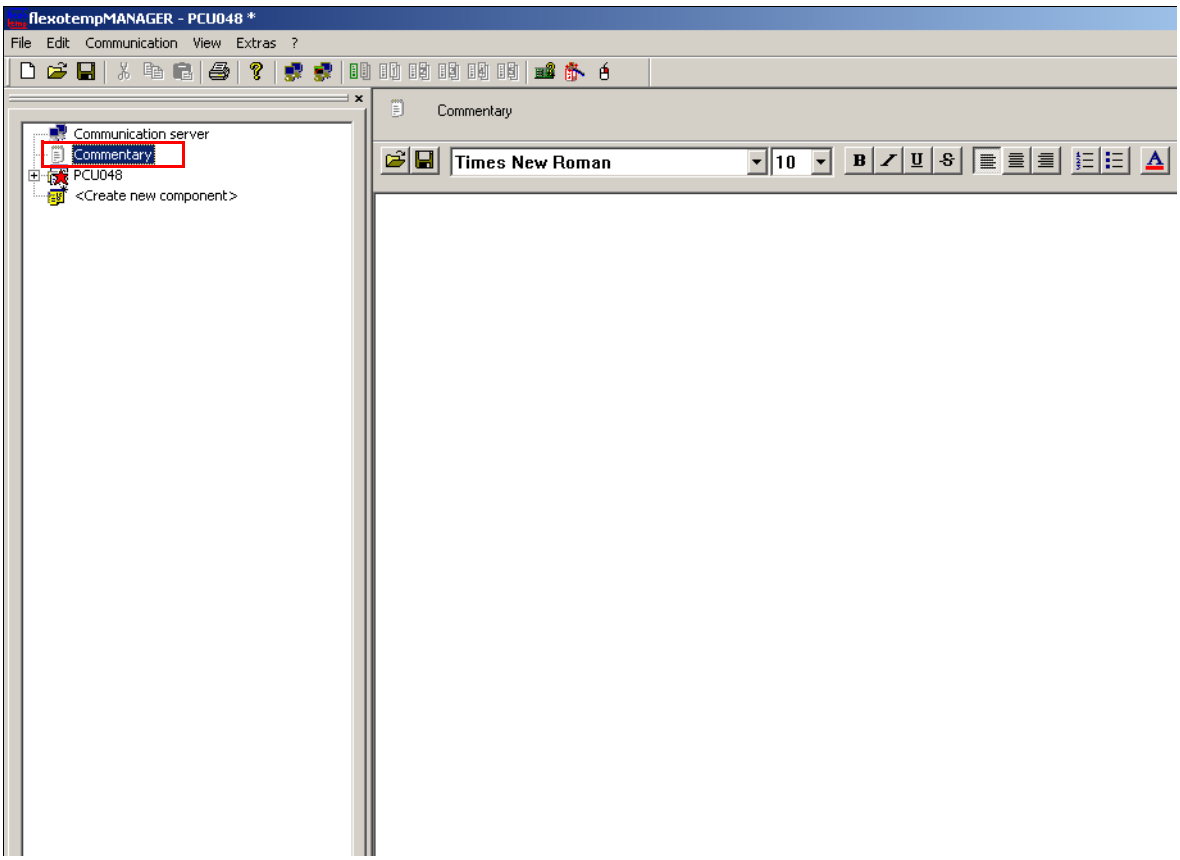


PCU components

Create new component	See chapter ↗Context menu for master components **Create new component** (only BACI)
rename	See chapter ↗Context menu for master components **rename**
delete	See chapter ↗Context menu for master components **delete**
transform to DIO16_CI_SPL **transform to DIO16_CI**	The simple component can be transformed to the component with Smart Power Limitation SPL functionality and vice versa. A message appears if in-/ output port DIO16 (X3.12) is used. (only for DIO16_CI and DIO16_CI_SPL)
Read parameter	See chapter ↗Context menu for master components **Read parameter**
Write parameter	See chapter ↗Context menu for master components **Write parameter**
Firmware update	See chapter ↗Context menu for master components **Firmware update**
Interfaces test	See chapter ↗Context menu for master components **Interfaces test**

5.2 Commentary for project

A text commentary can be tagged to the project using an editor. The comment is saved with the project.



Save or	The comment is saved as an RTF file in Installation directory → flexotempMANAGER → PROJECTS
Open or	An RTF file saved under Installation directory → flexotempMANAGER → PROJECTS is uploaded in the comment editor and the text at the end is attached.

5.3 Info page

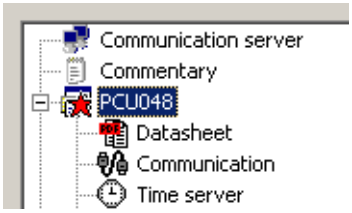
For each component an information page exists with entries for

- Component name
- DLL
- Data version (only master component)
- Software version
- Communication, in form of slot number, CAN NodeID
- Notifications list

The notifications list with plain text messages indicates to the operator

- that changes in flexotempMANAGER are not yet transferred to the controller
- that there are errors in the project setup

5.3.1 Notifications list - Changes



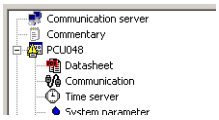
The user is informed that changes are not yet copied to the controller once a parameter and/or PROFINET IO data is altered in project setup. The master component is marked with a red star in the project tree and a corresponding text appears in the notifications list.

Notifications are reset upon successful transfer.

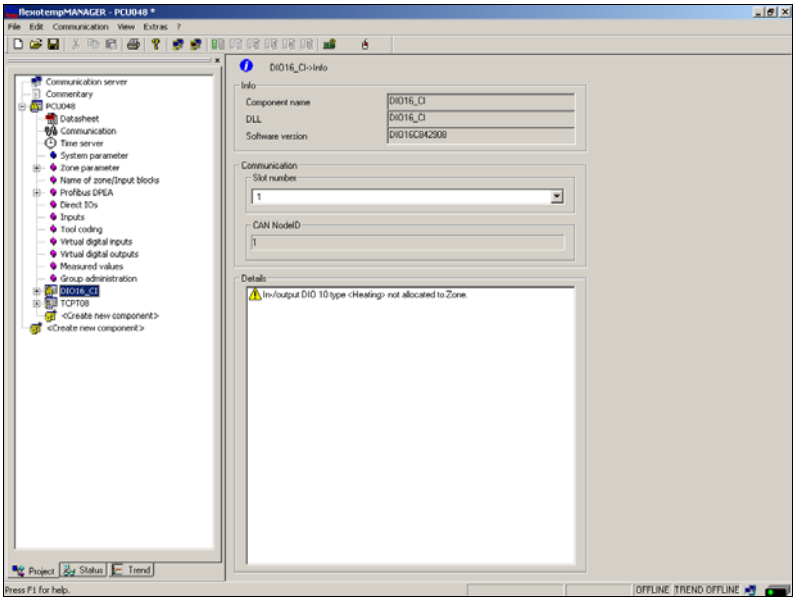
5.3.2 Notifications list - Project setup errors

Accompanying the project setup by the operator, flexotempMANAGER checks the plausibility for

- allocation of output to zone
- allocation to CoDeSys variable
- continuous addressing for RS485 and PCU components



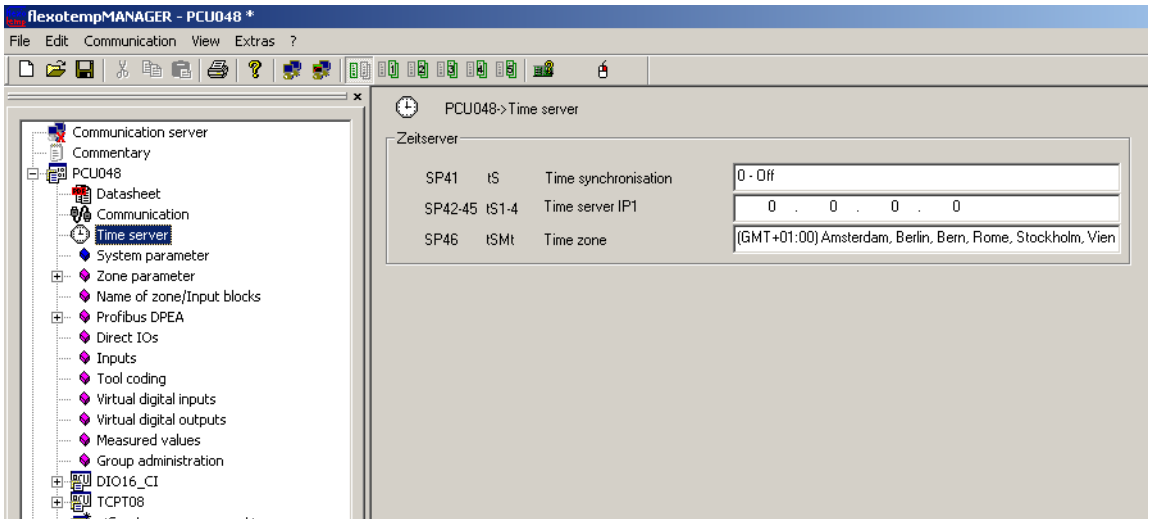
In the event of an error in project setup, such is displayed on the master component with a yellow triangle at the top level in the |Project| window. The project tree needs to be searched downwards until the error causing component has been found. Error needs to be rectified.



5.4 Time Server

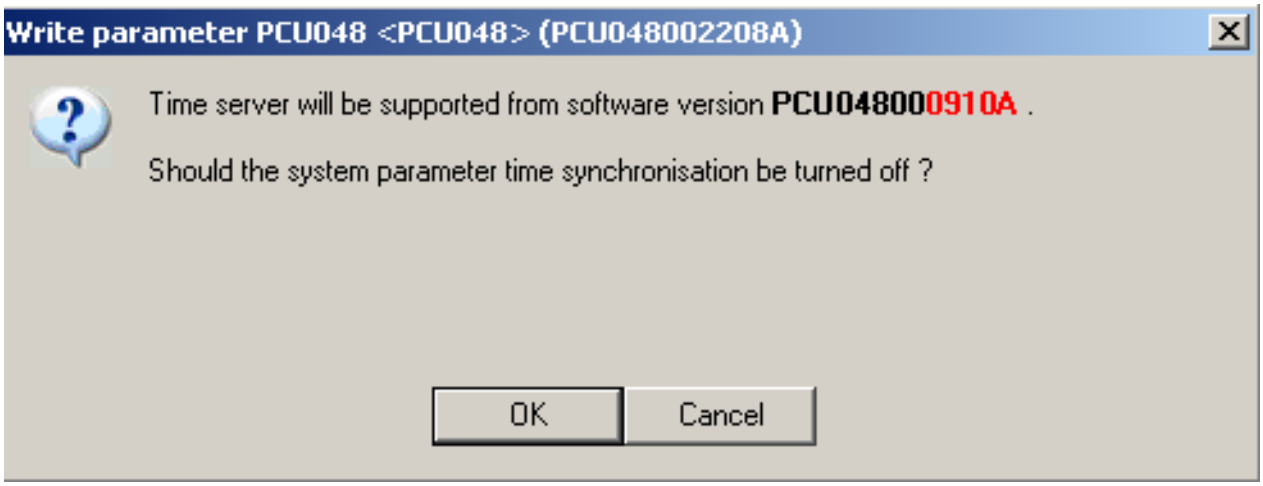
The time server, a PC equipped with the Network Time Protocol, where the project setup - and configuration tool flexotempMANAGER is running, provides the clients (master components MCU, PCU) with the current time stamp on request. Thus the master components are synchronized.

The time server is shown in the project for the master components, when under menu bar → <Extras> <Options> <Switch project view on/off> <Show time server> is ticked ☑.



The IP address of the time server (SP42…SP45]), that executes the time synchronization, as well as the time zone ([SP46]) must be specified.
After that the time synchronization ([SP41]) has to be started.

The change of the parameters lead to a flag (see chapter ↗Notifications list - Changes) on the master component.
A check whether the master component supports the time server is carried out when the changed parameters are transferred to the master component (software version 0910A onwards). If it is not supported, time synchronization ([SP41]) can be deactivated in this step.



6 In-/outputs

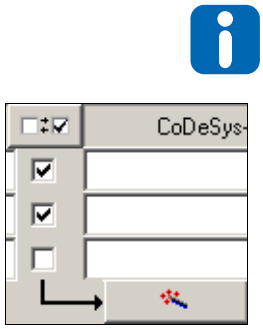
Processing of virtual and physical in-/output is defined in flexotempMANAGER.

This is in detail:

- virtual digital inputs VDI
- virtual digital outputs VDO
- Analog inputs (AI)
- Digital inputs (DI)
- Analog outputs (AO)
- Digital outputs (DO)

Project-setup occurs for every in-/output, i.e. an allocation to a marker / alarm in the system and a configuration, i.e. a parameter defines the action sequence / trigger of the marker / alarm.

Project setup and configuration occurs in the location where an in-/output is configured to work.



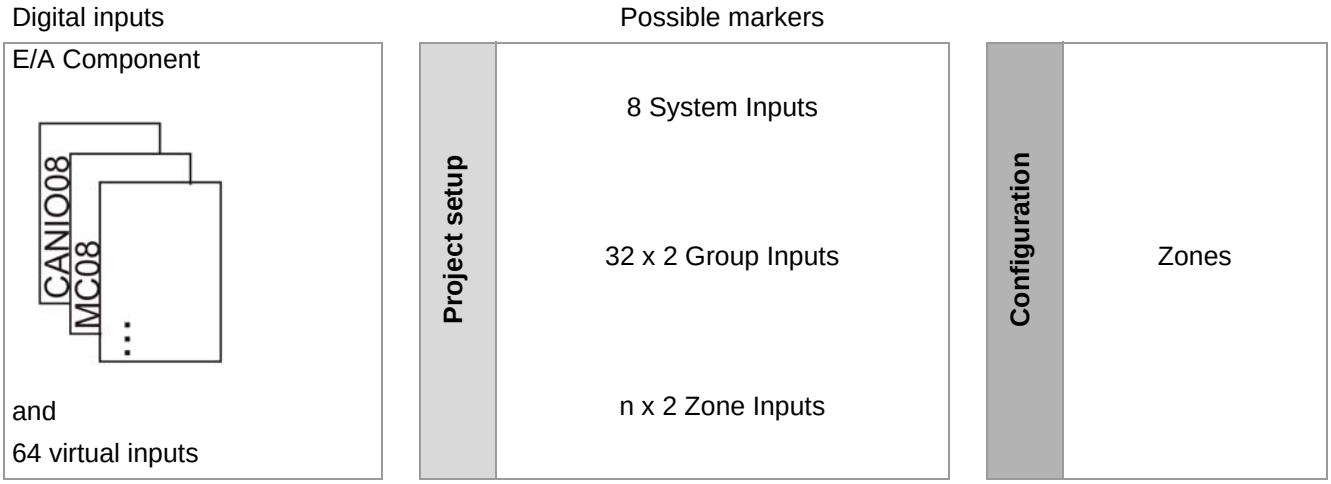
Configuration Wizard

For some components the in-/outputs can be configured via a wizard.
The in-/outputs to be configured are selected with ☑.
The wizard is activated by . Depending on the component, the Wizard offers the following menu settings that can be adopted for all

selected in-outputs with .

6.1 Digital inputs

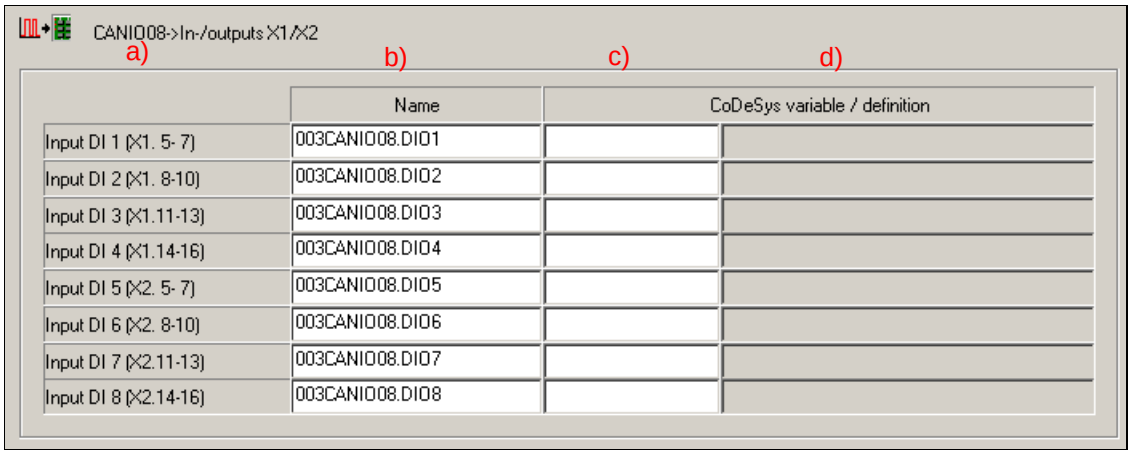
The project setup of a digital input is comparable to the allocation of a digital input to a marker. The markers reflect the condition of the digital input in the controller. There are system markers, group markers, or zone markers. Function specifications are configured based on the markers.



n: number of zones depending on MCU/PCU

Project setup for a physical digital input of an E/A component is implemented through

- a description a) as provided by flexotempMANAGER
- a standard name b) as provided by the system that can be changed by the user
- the type c) <digital input> (only for combined digital in-/outputs)
- a CoDeSys variable d) for the programming of own functions (for controllers with Soft-PLC option)



Example: E/A component CANIO08 with 8 digital inputs.

Project setup for digital inputs (DI): MCU/PCU (Window → |Project| <MCU/PCU> <Inputs>).

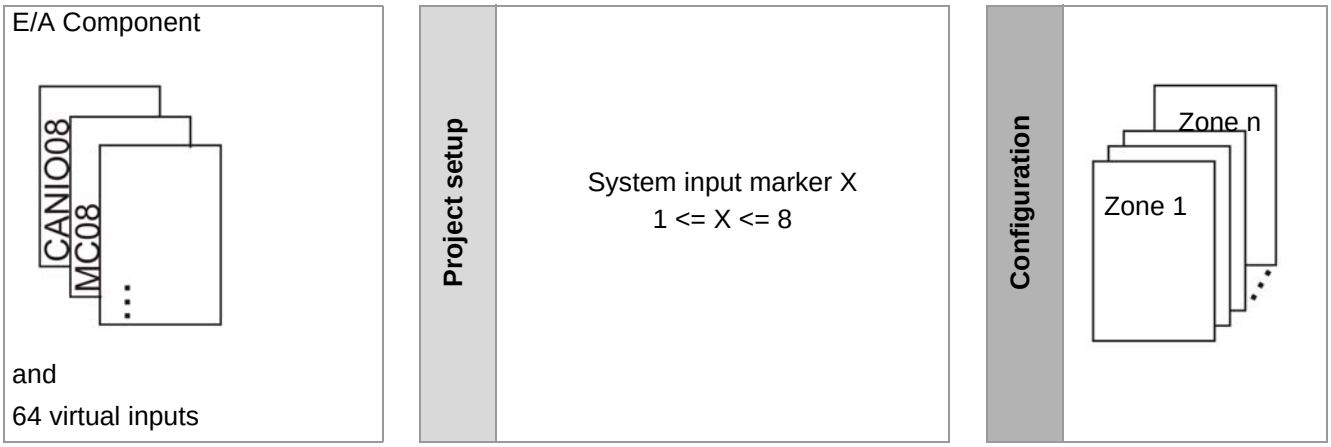
6.1.1 System Input

A system input allocated to a system input marker always influences the entire system, i.e. all zones. Projects can be set-up for 8 system inputs. The functions of the system input parameter is specified by the configuration of:

- [SP09] IN1S – Function System Input 1,
- [SP10] IN2S – Function System Input 2,
- etc.

(Please find detailed information in further documentation on parameters in chapter ↗Additional and continuative documents Parameter [SP23], [SP24], [SP25], [SP26], [SP27], [SP28]).

Digital inputs



n: number of zones depending on MCU/PCU

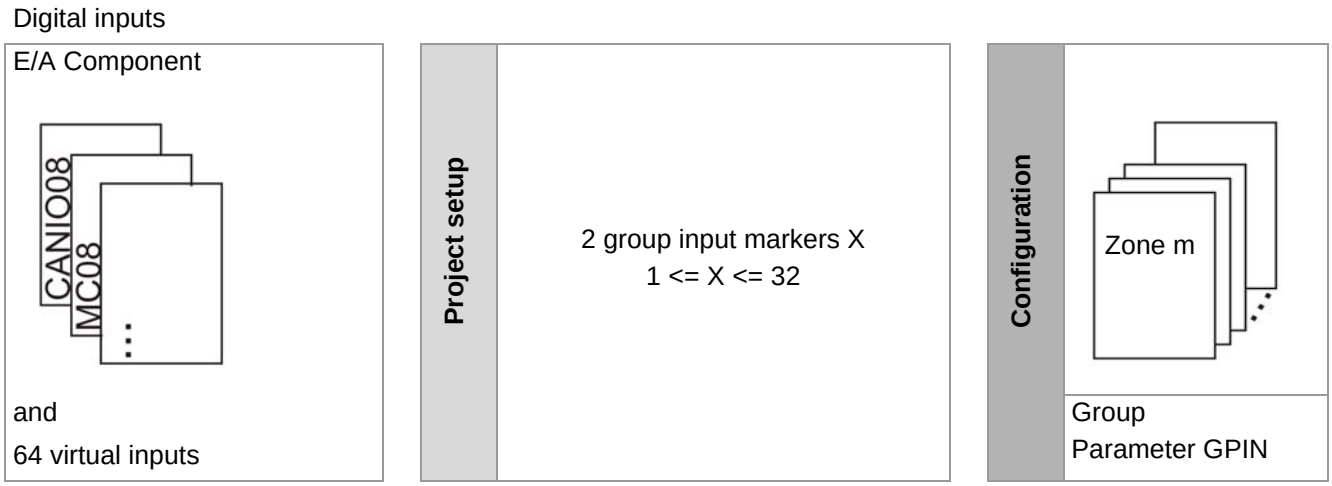
6.1.2 Group Input

Each zone can be allocated to one of the 32 input groups. 2 functions can be allocated to each group. Projects can be set-up on 32 x 2 group inputs. A digital input that is allocated to a group input marker influences all zones that are allocated to the group. The functions of the group input parameter is specified by the configuration of:

- [SP082] IN1C – Function Zone Input 1
- [SP083] IN2C – Function Zone Input 2

The allocation of a zone to an input group occurs via parameter [P084] GPIN - Input Group (also see window |Project| <MCU/PCU> <Group Administration > <Input Group>).

(Please see chapter ↗Additional and continuative documents for detailed information in further documentation on parameters).



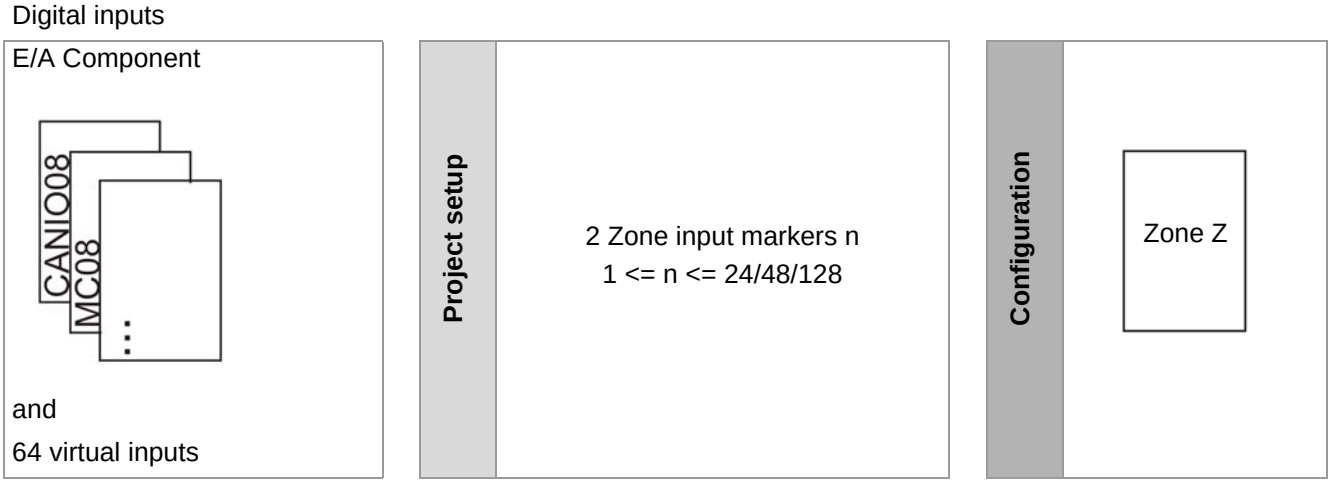
m: Grouped zones

6.1.3 Zone input

Each zone can be allocated to a zone input. 2 functions can be allocated to each zone input. Projects can be set-up on n x 2 zone inputs. A digital input that is allocated to a zone input marker influences the zone to which it is allocated. The functions of the zone input parameter is specified by the configuration of:

- [SP082] IN1C – Function Zone Input 1
- [SP083] IN2C – Function Zone Input 2

(Please see chapter ↗Additional and continuative documents for detailed information in further documentation on parameters).



n: number of zones depending on MCU/PCU

Z: a zone

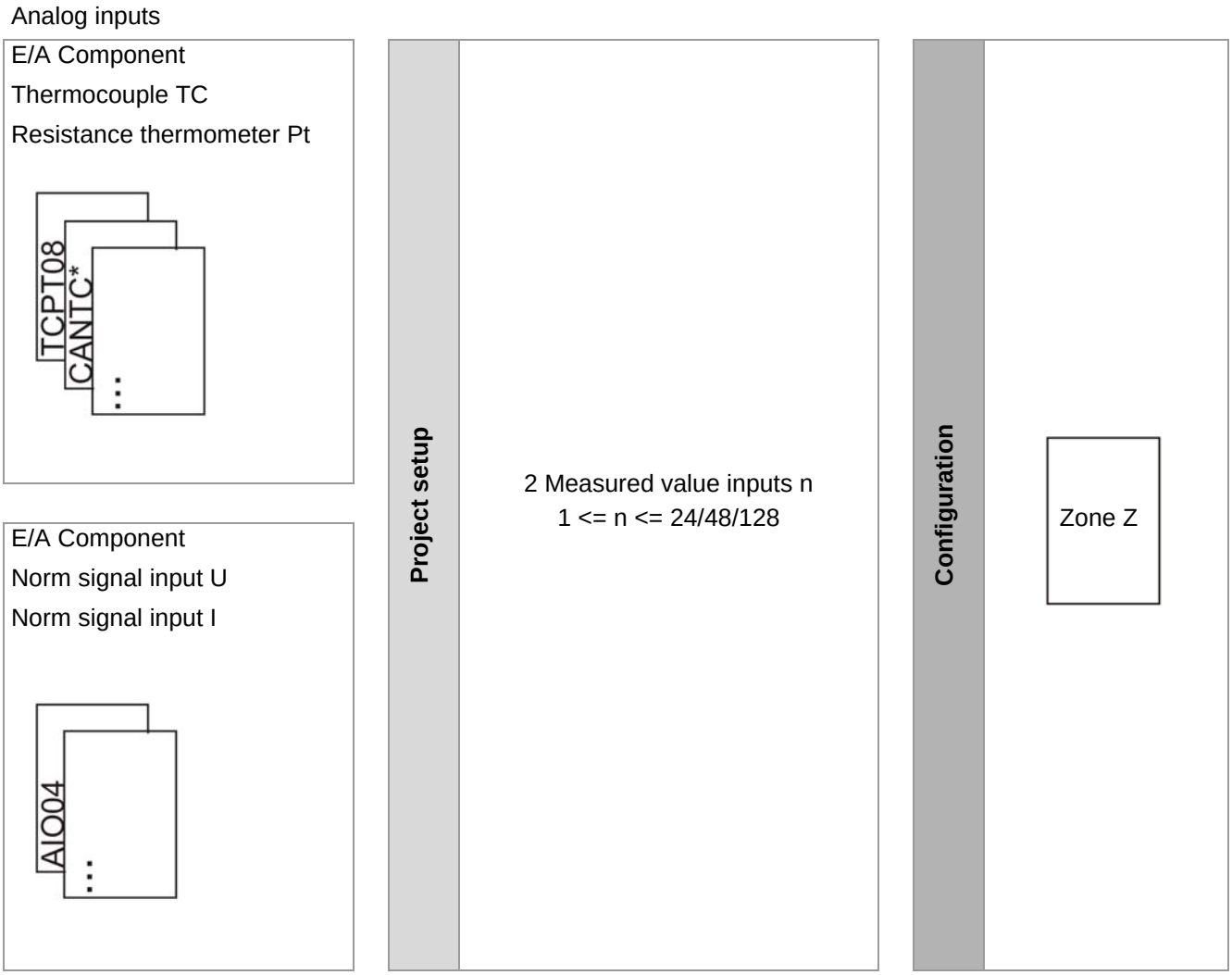
6.1.4 Prioritization when processing digital inputs / markers

As there are several types of inputs/markers and also as there is more than only one input/marker per group/zone, the inputs / markers are processed as follows:

- System input 8 (highest priority)
- System input 7
- …
- System input 1
- Group-/zone input 2
- Group-/zone input 1 (lowest priority)

6.2 Analog inputs

An analog input that is allocated to a measured value input influences the zone it is allocated to. 2 measuring value inputs can be allocated to each zone.

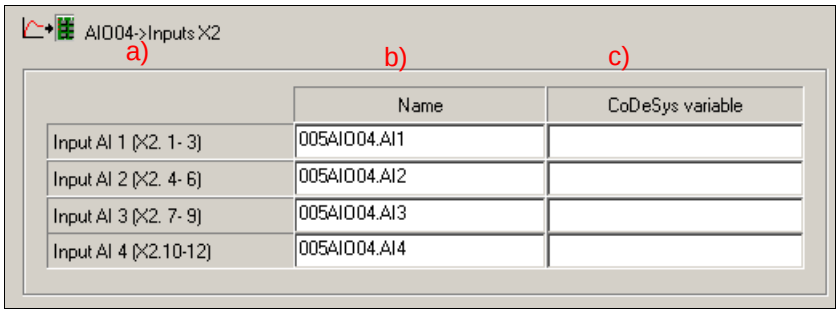


n: number of zones depending on MCU/PCU

Z: a zone

A physical analog input of an E/A component is defined through

- a description a) as provided by flexotempMANAGER
- a standard name b) as provided by the system that can be changed by the user
- a CoDeSys variable c) for the programming of own functions (for controllers with Soft-PLC option)



Example: E/A component AIO04 with 4 digital inputs.

Project setup analog inputs (AI): MCU/PCU (Window → |Project| <MCU/PCU> <Measured values>).
The functions of the measured value input parameter are specified by the configuration of:

- [P008] SEnC – Actual Value of Control

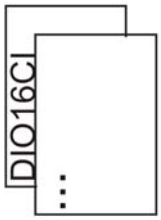
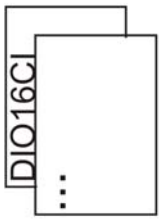
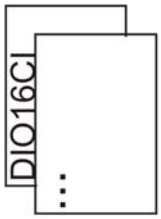
(Please find detailed information on parameters in chapter ↗Additional and continuative documents Parameter [P063], [P064], [P065], [P066], [P067], [P068], [P069], [P070], [P071], [P072]).

6.3 Digital outputs

Data collected in the controller is monitored and is available by configuring the specifications of responding. When setting up a project on a digital output the allocation to a digital output is created.

The collected data includes

- Output value of one of the n control zones
- System, group, or zone alarms
- Virtual digital output
- further data

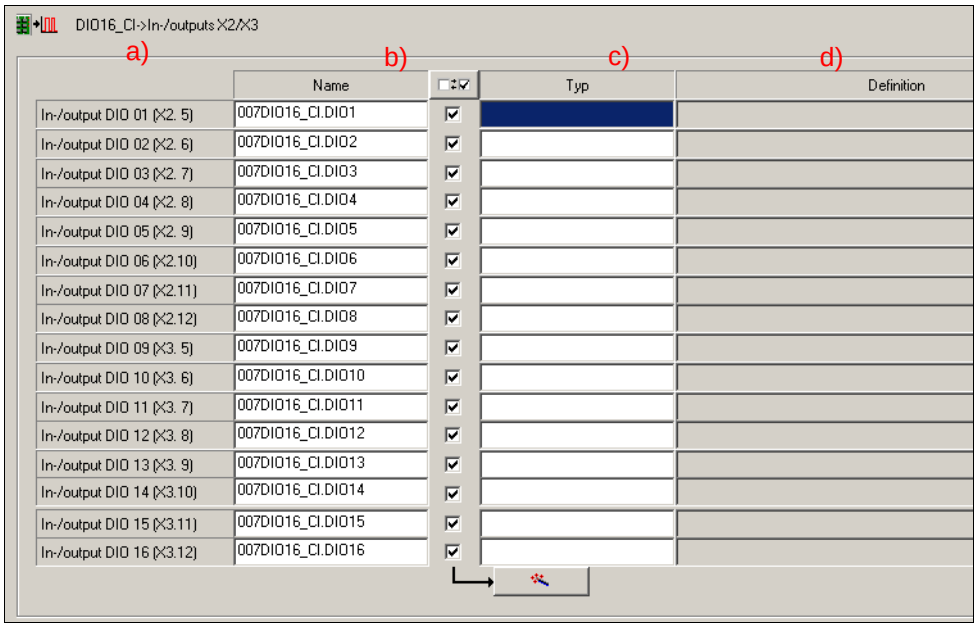
	Control outputs / Possible alarms / Virtual data outputs	Digital outputs
Zones Control output	**Configuration**: Cooling Heating Heating with current measurement Heating with common supply Cooling with common supply	**Project setup**: E/A Component Control output 
Zones Monitors for: 6 Limit Values Current Sensor	**Configuration**: 4 System Alarms 32 x 4 Group alarms n x 4 Zone alarms	**Project setup**: E/A Component Alarm 
	Configuration: 64 Virtual digital outputs	**Project setup**: E/A Component Virt. Digital output 

further data (see chapter ↗Further data)

n: number of zones depending on MCU/PCU

A physical digital input of an E/A component is defined through

- a description a) as provided by flexotempMANAGER
- a standard name b) as provided by the system that can be changed by the user
- a type c) and a corresponding definition d)
- a CoDeSys variable d) for the programming of own functions (for controllers with Soft-PLC option)



Example: E/A component DIO16CI with 16 DIO's.

Project setup digital outputs (DO): E/A-Component (Window → |Project| <E/A-Component> under <In-/Outputs> and/or <Outputs>).

Technical changes reserved

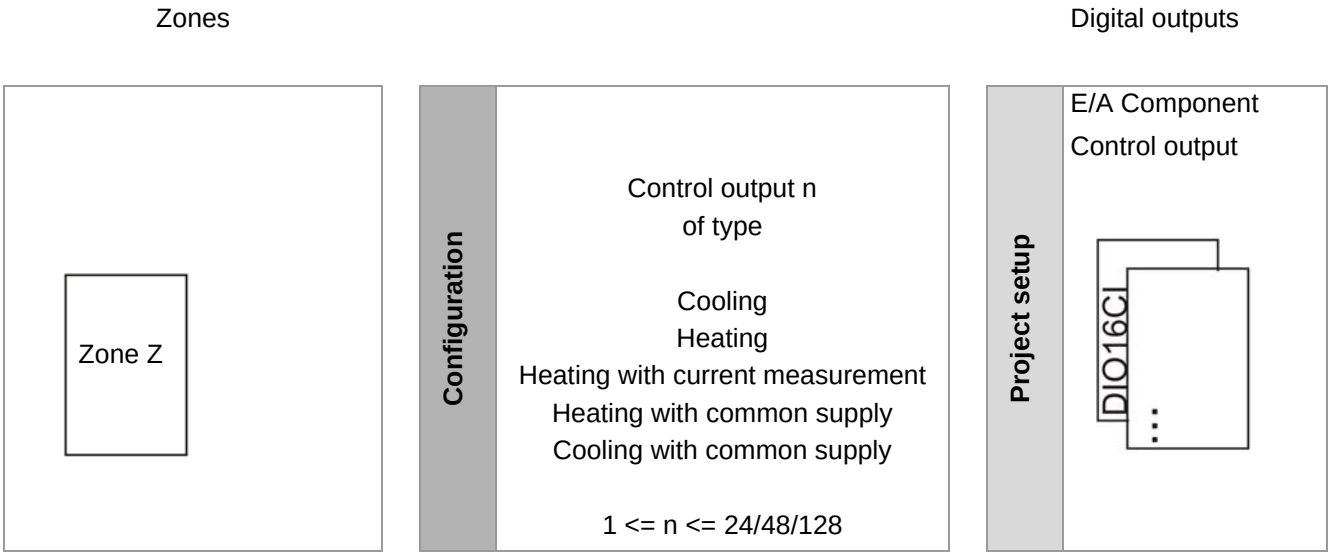
6.3.1 Control output

The output value of one of the n control zones can be relayed on a digital output. The following types are available:

Type	Meaning
Cooling	Output active when output value < 0%
Heating	Output active when output value > 0%
Heating with current measurement	Current reading within the time-frame defined in the component.
Heating with common supply	"Common supply" means that the actuators (heating, cooling fans, etc.) connected via the control outputs may be supplied over the same power supply. Exact heating current measuring is still possible as the I/O module deactivates the respective outputs (also the cooling outputs) for current measuring.
Cooling with common supply	

The actuating signal is relayed through a PWM signal, the control of the heating current monitoring occurs through the module on which the digital output is located.

Projects can be set-up for n control outputs. A control output is set on the digital output to which it is allocated.



n: number of zones depending on MCU/PCU

Z: a zone

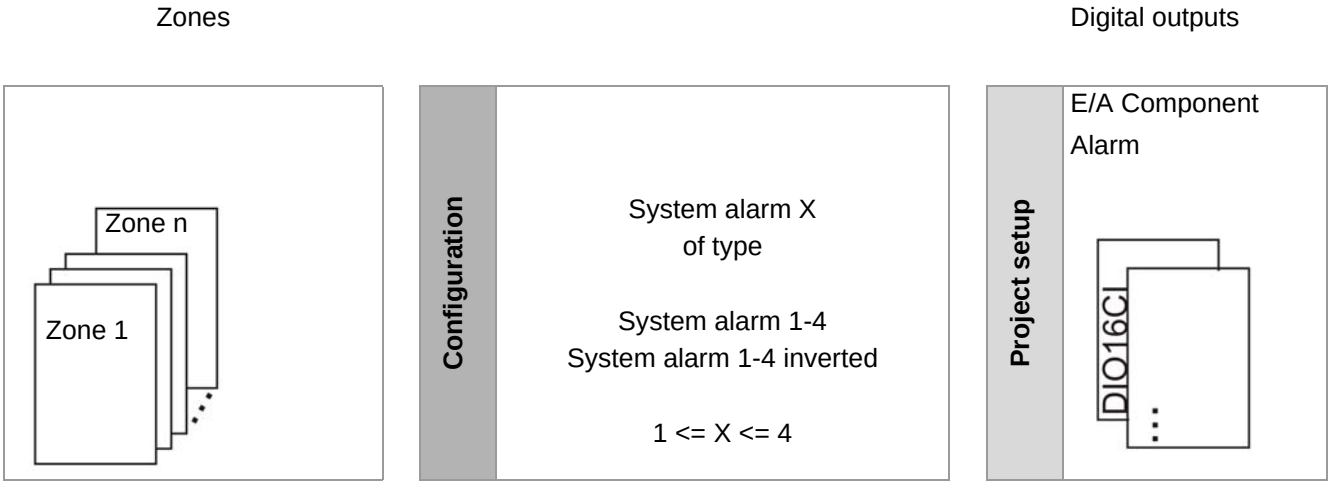
6.3.2 System alarm

A system alarm is triggered when a zone of the controller has triggered a respective alarm. The system alarm is relayed on the digital output to to which it is allocated. Projects can be set-up for 4 system alarms. The trigger of the system alarm is defined by configuring the following parameters:

- [P011] S1D1 – Definition Byte 1 – System Alarm 1
- [P012] S1D2 – Definition Byte 2 – System Alarm 1
- [P013] S2D1 – Definition Byte 1 – System Alarm 2
- [P014] S2D2 – Definition Byte 2 – System Alarm 2
- [P015] S3D1 – Definition Byte 1 – System Alarm 3
- [P016] S3D2 – Definition Byte 2 – System Alarm 3
- [P017] S4D1 – Definition Byte 1 – System Alarm 4
- [P018] S4D2 – Definition Byte 2 – System Alarm 4

To trigger an alarm definition byte 1 and definition byte 2 are always analyzed.

(Please see chapter ↗Additional and continuative documents for detailed information in further documentation on parameters).



n: number of zones depending on MCU/PCU

6.3.3 Group alarm

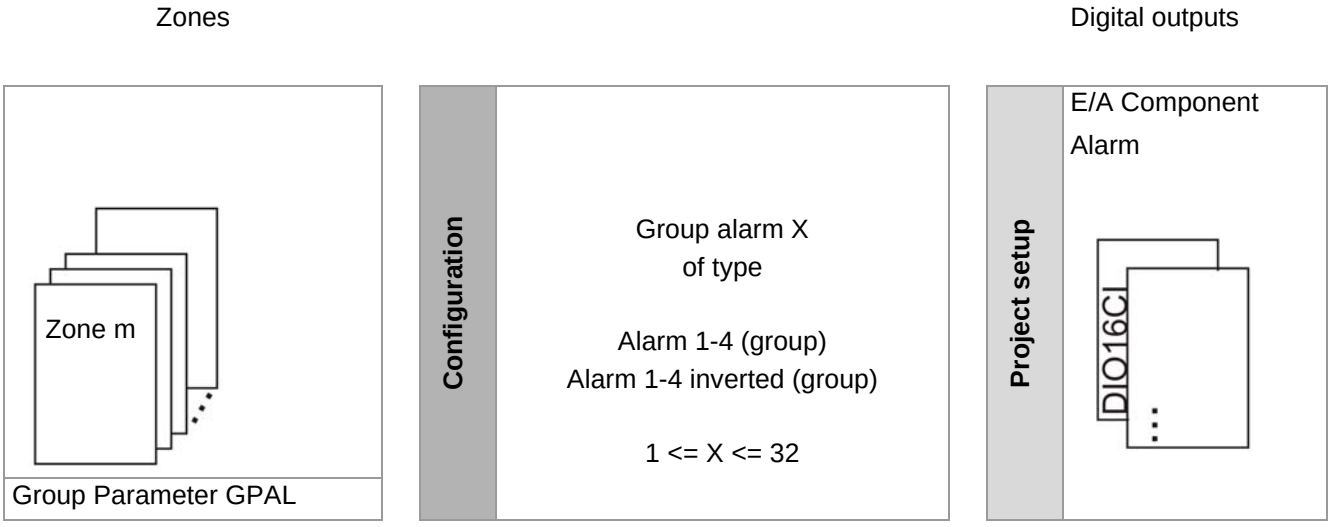
A group alarm is triggered when at least 1 of n zones in a group have triggered an alarm. The group alarm is relayed on the digital output to to which it is allocated. Projects can be set-up on 32 x 4 group alarms. The trigger of the group alarm is defined by configuring the following parameters:

- [P073] A1D1 – Definition Byte 1 – Alarm 1
- [P074] A1D2 – Definition Byte 2 – Alarm 1
- [P075] A2D1 – Definition Byte 1 – Alarm 2
- [P076] A2D2 – Definition Byte 2 – Alarm 2
- [P077] A3D1 – Definition Byte 1 – Alarm 3
- [P078] A3D2 – Definition Byte 2 – Alarm 3
- [P079] A4D1 – Definition Byte 1 – Alarm 4
- [P080] A4D2 – Definition Byte 2 – Alarm 4

The allocation of a zone to an alarm group occurs via parameter [P081] GPAL – Alarm group (also see window |Project| <MCU/PCU> <Group administration> <Alarm group>).

To trigger an alarm definition byte 1 and definition byte 2 are always analyzed.

(Please see chapter ↗Additional and continuative documents for detailed information in further documentation on parameters).



m: Grouped zones

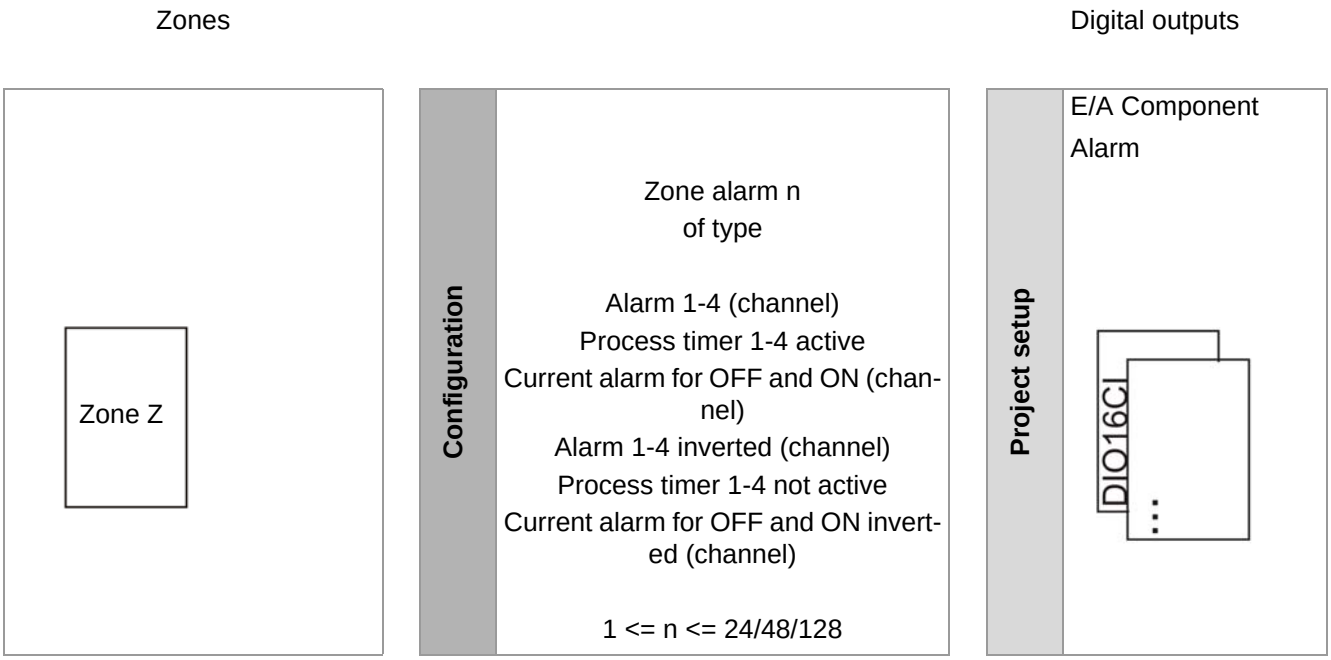
6.3.4 Zone alarm

A zone alarm is triggered when the allocated zone has triggered an alarm. The zone alarm is relayed on the digital output to to which it is allocated. Projects can be set-up for n x 4 zone alarms. The trigger of the zone alarm is defined by configuring the following parameters:

- [P073] A1D1 – Definition Byte 1 – Alarm 1
- [P074] A1D2 – Definition Byte 2 – Alarm 1
- [P075] A2D1 – Definition Byte 1 – Alarm 2
- [P076] A2D2 – Definition Byte 2 – Alarm 2
- [P077] A3D1 – Definition Byte 1 – Alarm 3
- [P078] A3D2 – Definition Byte 2 – Alarm 3
- [P079] A4D1 – Definition Byte 1 – Alarm 4
- [P080] A4D2 – Definition Byte 2 – Alarm 4

To trigger an alarm definition byte 1 and definition byte 2 are always analyzed.

(Please see chapter ↗Additional and continuative documents for detailed information in further documentation on parameters).

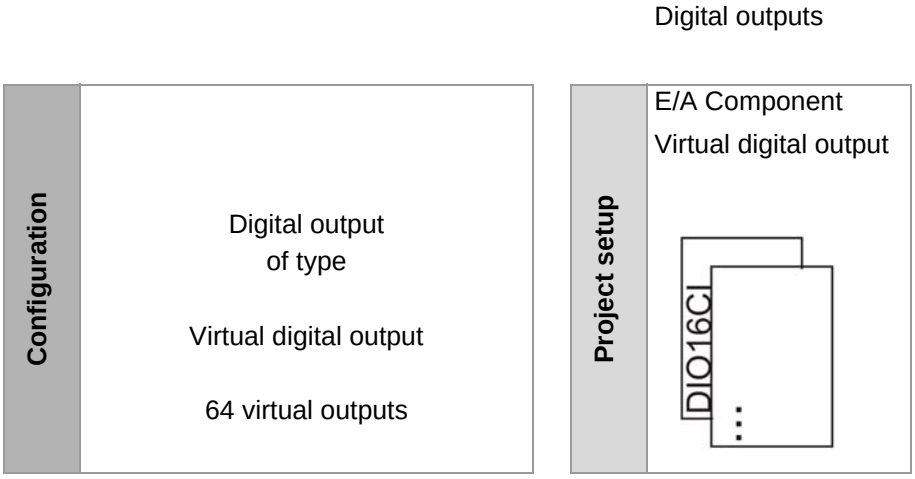


n: number of zones depending on MCU/PCU

Z: a zone

6.4 Virtual digital output

Control system conditions can be relayed to real digital outputs over the so-called virtual digital outputs.

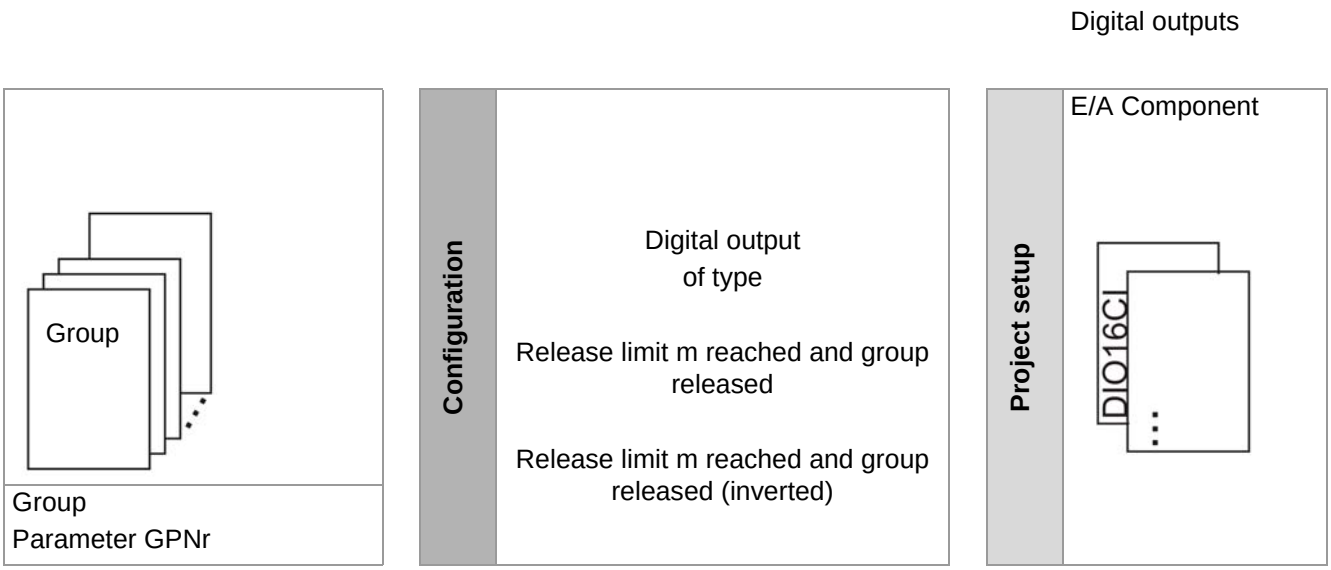


6.5 Further data

6.5.1 Release limit values

In order to enable controller-surpassing functions, such as cascading heating-up over several controllers, digital outputs of type <Release limit value n reached and group released> (inverted signal possible) can be configured.

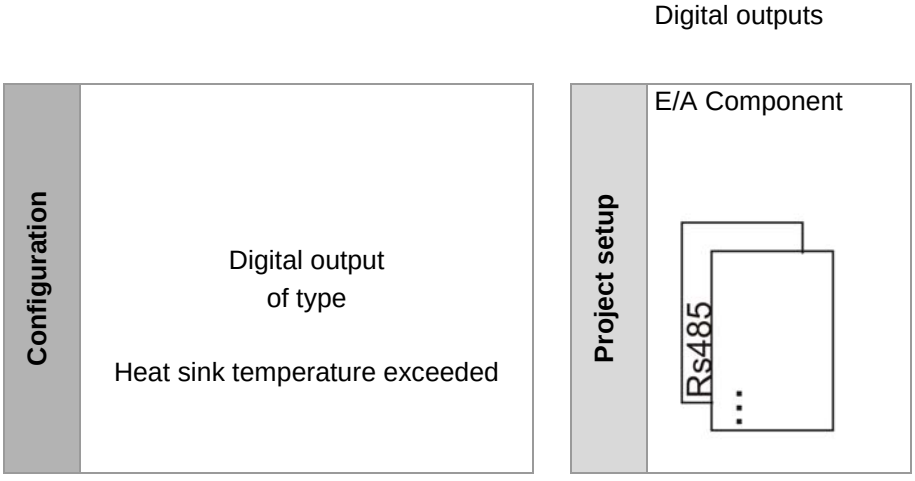
For details on parameter configuration, please see the operating manual for temperature control system flexotemp® Parameters (chapter Group Functions).



m: Grouped zones

6.5.2 Heat sink temperature limit value

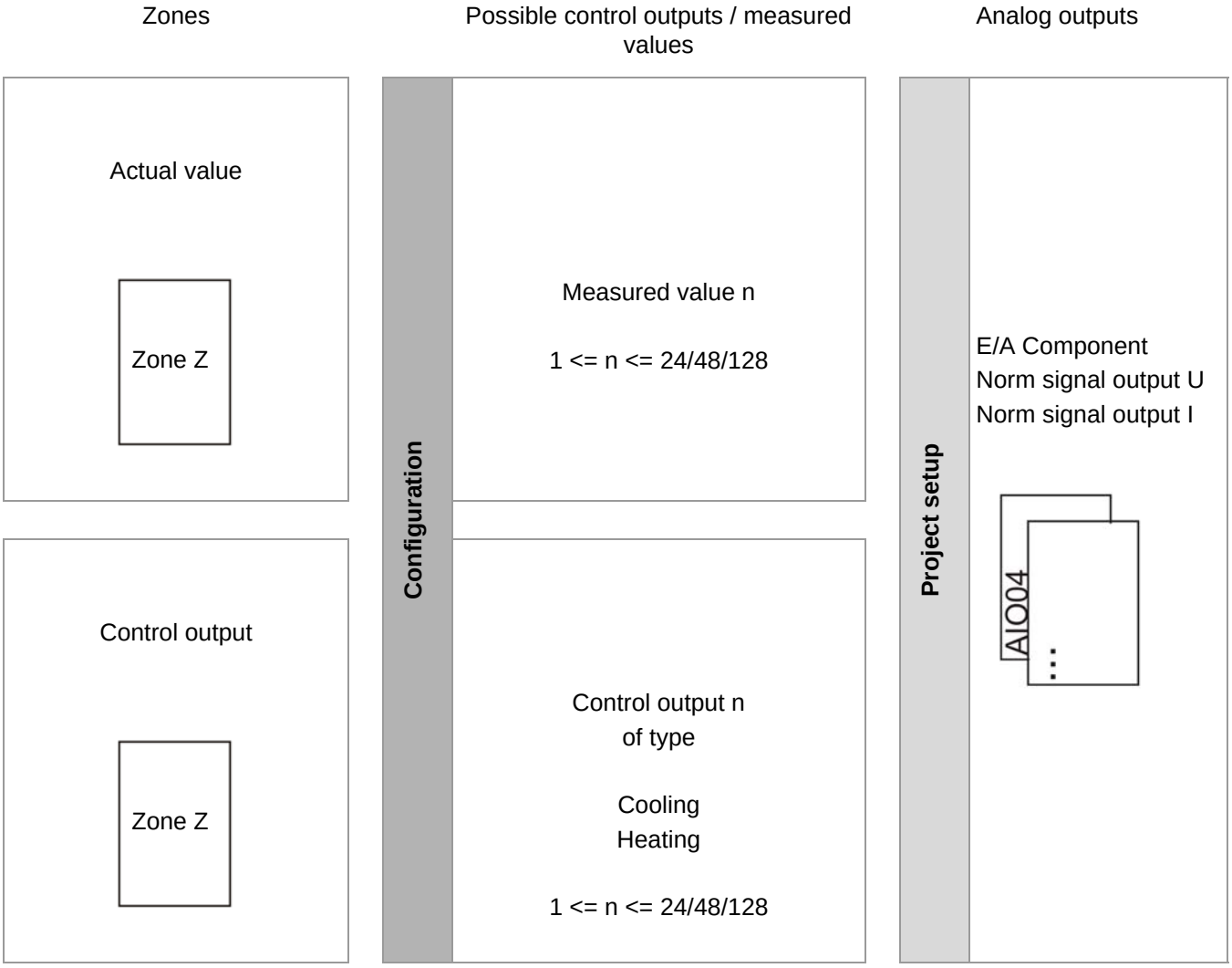
An exceeding of the heat sink temperature can be monitored by the controller if a project is set up and configured (parameter [SP12] S1D2, please see operating manual temperature control system flexotemp® Parameter) accordingly. A digital output of an RS485 component of type <Heat sink temperature limit value exceeded> transmits this signal to an output.



6.6 Analog outputs

Analog outputs can be used for

- relaying output values
- standardized relaying of measured values
- relaying of CoDeSys variables

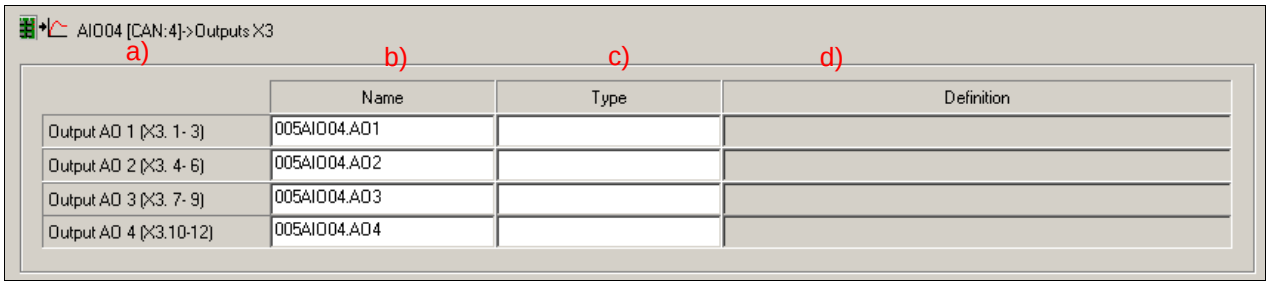


n: number of zones depending on MCU/PCU

Z: a zone

A physical analog output of an E/A component is defined through

- a description a) as provided by flexotempMANAGER
- a standard name b) as provided by the system that can be changed by the user
- a type c) and a corresponding definition d)
- a CoDeSys variable d) for the programming of own functions (for controllers with Soft-PLC option)



Example: E/A component AIO04 with 4 analog outputs.

Projects can be set-up for n control outputs and measured values. A control output / measured value is relayed on those analog outputs to which it is allocated.

Technical changes reserved

7 Communication by Profibus

The master component can be addressed by Profibus DP and/or Profibus DPEA.

For Profibus DPEA

- specify the communication parameter [CP13] DPEA – Profibus DPEA protocol = ON
- configure the communication settings and the object lists for the input and output buffers (SPS) under <Project> <Profibus DPEA>

The procedure for

- project setup and configuration with flexotempMANAGER
- test in Online mode without control and/or for debugging of input and output buffers (SPS)
- necessary settings of Profibus DPEA for integration in Profibus of S7

are detailed described in the corresponding protocol descriptions (see chapter ↗Additional and continuative documents).

8 Communication by PROFINET IO

The master component can be addressed by PROFINET IO, when one master component with the mnemonic "PNIO" is used.

For PROFINET IO

- configure the communication settings and the object lists for the input and output buffers (SPS) under <Project> <PROFINET IO>

The procedure for

- project setup and configuration with flexotempMANAGER
- test in Online mode without control and/or for debugging of input and output buffers (SPS)
- necessary settings of PROFINET IO for integration in a PROFINET network

are detailed described in the corresponding protocol descriptions (see chapter ↗Additional and continuative documents).

The procedure of project setup and configuration in flexotempMANAGER and the necessary settings for integration in a PROFINET network are detailed described in the corresponding protocol descriptions (see chapter ↗Additional and continuative documents).

9 Direct IOs

Direct IOs allow direct access to digital / analog in/outputs of flexotemp® components via CAN-Bus, Ethernet, Profibus, PROFINET IO and CoDeSys. A maximum of 300 Direct IOs can be processed.

Menu bar → <View> <Project>, Register <Project>, <Direct IOs>

Direct IOs	Selection item Direct IO is displayed in the |Project| window below the master component. Direct IOs are available since flexotempMANAGER-Version 1.04.00 for components with software version kk4009z (see chapter ↗Software version of components) ■ TCPT08 ■ TC12 ■ PT12 ■ DIO16_CI ■ DIO16_CI_SPL ■ AIO04 ■ DO08R ■ MPI02 ■ CANAIN08 ■ CANTC12 ■ CANTC 24 ■ CANIO08 are available.
	flexotemp® components are displayed in the |Direct IOs| <Component groups> window. If there are no Direct IOs it is displayed under <Variable>.

9.1 Accessing Direct IOs in flexotempMANAGER

There are different ways to access Direct IOs, i.e.

- I/O buffer access
- CAN access
- CoDeSys access (see chapter ↗Access via CoDeSys)

Which access is possible depends on the flexotemp® component.

9.1.1 I/O buffer access

Using I/O buffer access, the Direct IOs are accessed via the IN-/OUT buffer of the master component MCU/PCU to which the Direct IOs are mapped.

Advantage	There is no additional utilization of the internal CAN bus from the access process.
Disadvantage	The in-/output is refreshed during the MCU/PCU master component project setup cycle (depends on the number of connected flexotemp® components).
Access time	Depends on the slave component, usually 500 msec.

9.1.2 CAN access

Using CAN access

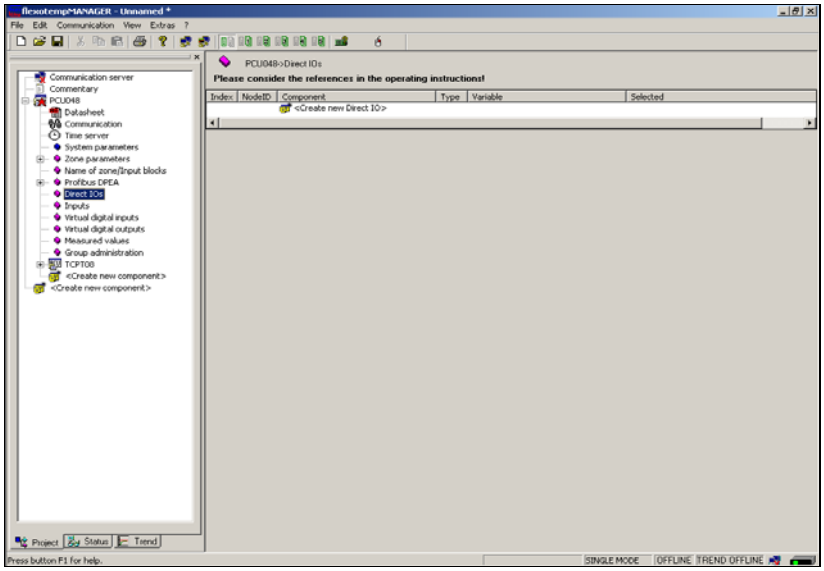
- Writing to outputs occurs directly via writing the Direct IO resembling CAN object to the flexotemp® component.
- Reading of the inputs occurs cyclically. All Direct IOs defined in the Direct IO table (see chapter ↗Direct IOs table) are read subsequently. The number of Direct IOs in the table is the determinant. There is a minimum wait of 10 msec between each reading of a Direct IO to avoid an excessive increase of CAN utilization and to ensure the remaining functions.

Advantage	Fast access.
Disadvantage	Additional utilization of the CAN bus.
Access time	From firmware version PCUMCU 4513A For the first 20 objects < 100 ms Then dependent of number of objects in table, system design, components configured

9.2 Direct IOs table

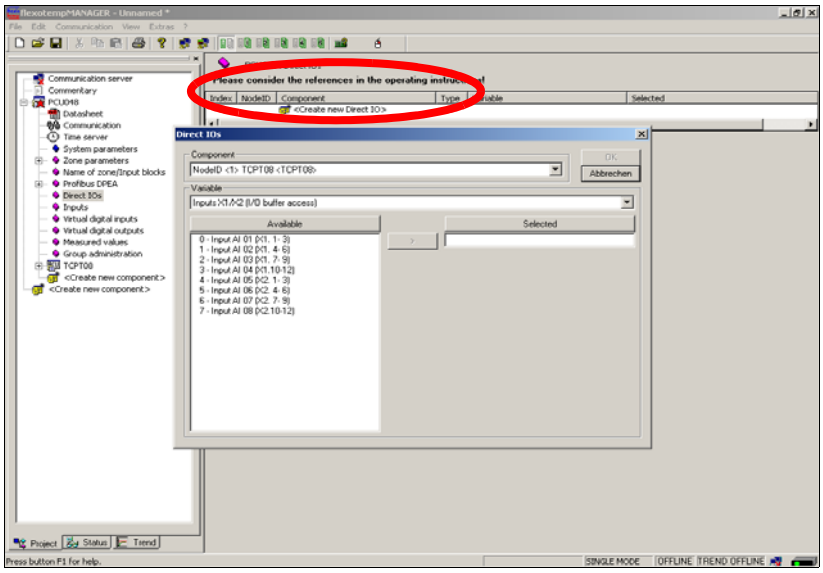
All flexotemp® components with a set project are listed under selection item Direct IOs.

Select menu item <Direct IOs> in the |Project| window



flexotemp® components are displayed in the |Direct IOs| <Component groups> window. If there are no Direct IOs it is displayed under <Variable>.

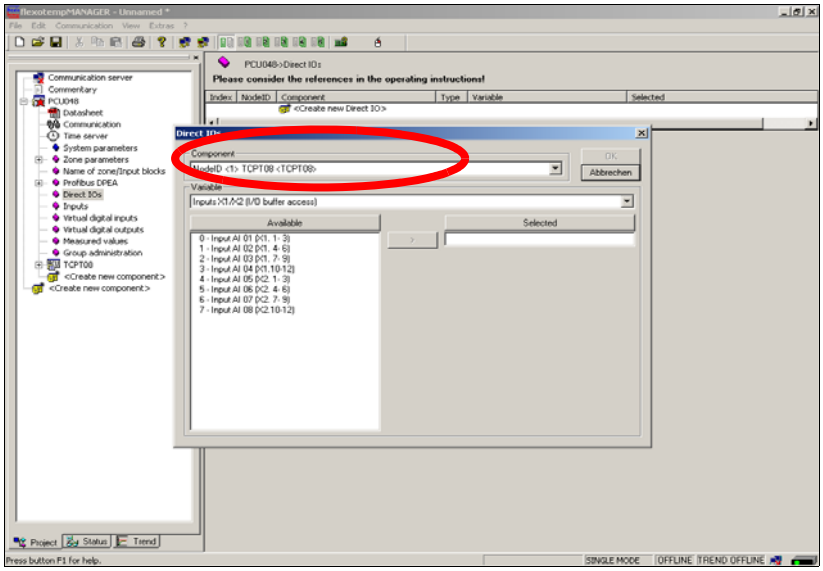
Select table element <Create new Direct IO>



Select from dialog window

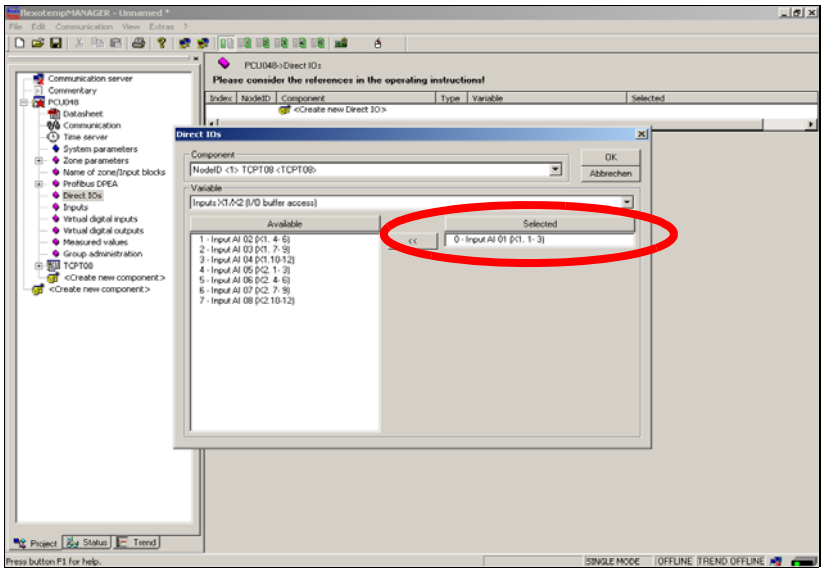
<Component> (flexotemp® component)

<Variable> (In-/output and Access mode)

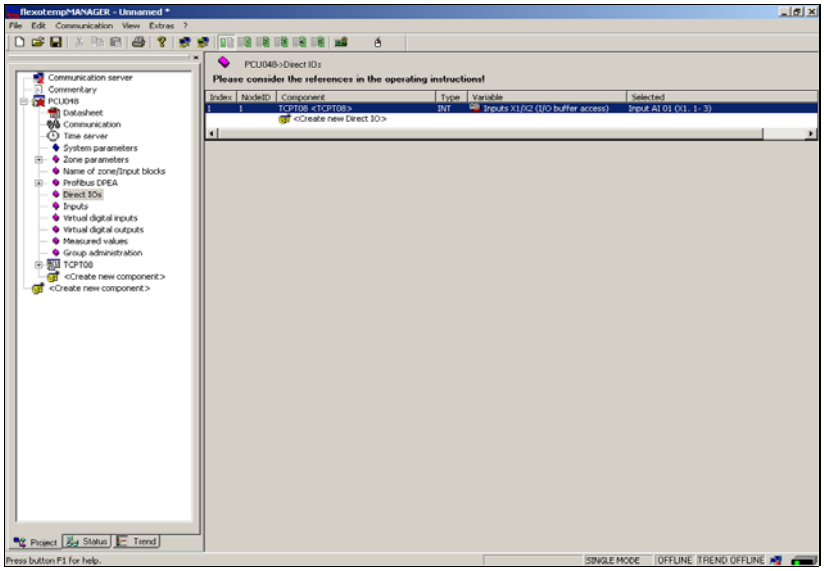


The available in-/outputs for the respective access mode are displayed under <Available>

Select in-/outputs and use > to transfer to the <Selected> window



The selected in-/output of the flexotemp® component is displayed in the Direct IOs table.



The Direct IO table is transferred to MCU/PCU to write the project setup for the master component and from there it is saved to EEPROM.

Direct IOs table

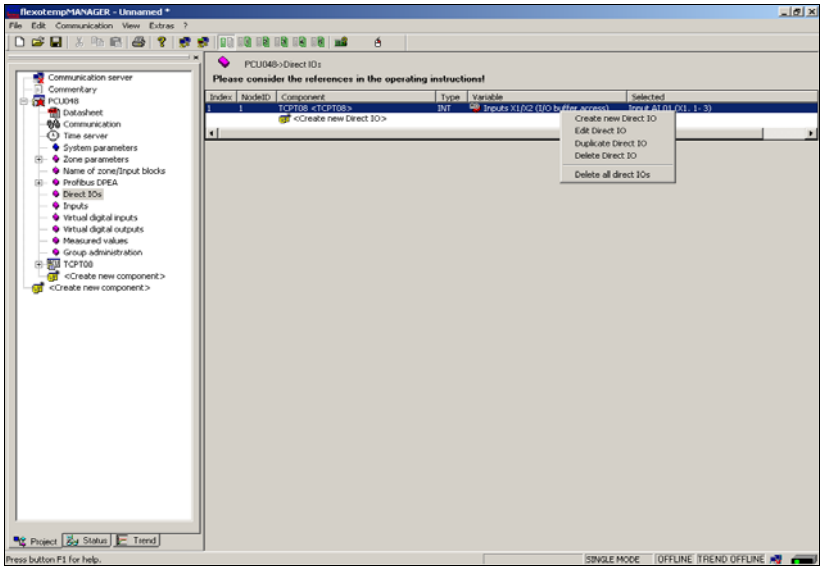
The direct IOs table displays the following information:

Index	Index of Direct IO's. The variables CAN bus, Ethernet, Profibus, PROFINET IO, CoDeSys are accessed via this index (see ↗Access via Direct IOs).
NodeID	NodeID of flexotemp® component.
Component	Displays component / flexotemp® component

Type	Type of Direct IO. The type is necessary for correct reading / writing of Direct IOs (see chapter ↗Direct IOs table - Type).
Variable	Displays Direct IO. Direct IO may be read only (RO) or read and write (RW).
Selected	Displays which in-/output of the flexotemp® component is allocated to the Direct IOs.

Making changes to the Direct IOs table

Once there are Direct IO entries in the table, changes can be made to the Direct IOs table by



selecting the Direct IO via primary mouse key → press secondary mouse key → the respective selection menu is displayed.

The Direct IO's table can be changed.

Once an in-/output for Direct IOs is selected and successfully allocated it is not available for project setup anymore. Then <Direct IOs> is displayed in the |Project| window under <Definition> at the flexotemp® component in-/outputs.

9.2.1 Direct IOs table - Type

The Direct IO type defines how the master component MCU/PCU is expecting the Direct IO value.

If the type is defines as **WORD** the user must send the value via CAN-Bus/Ethernet/Profibus/PROFINET IO to the master component as a **WORD**.

If, in addition, a type comes with a bit mask (see column <Selected> only the selected bits of the bit mask are read. This only applies to digital in-/outputs. The bit mask ensures that only digital outputs defined for the Direct IOs are set by the Direct IO. All others are still available for project setup and are still controlled thereby.

10 Status

The status page shows

- the data sheet belonging to the component (independent of <Online>)
- the operating instructions (when existing) belonging to the component
- communication status (communication server - master component - slave components)
- time server status
- system parameter status
- zone parameter status
- pre-defined status views of
  - single parameters, flags, timer
  - project setup
  - in-/outputs
  - the communication via Profibus/PROFINET IO
  - measured readings on the component
  - alarm conditions
  - Date / Time

if communication is <Online>.

Menu bar → <View> <Project>, Register <Status>

System and zone parameters are defined for the entire system, i.e. the same descriptions, value ranges, etc. apply for project and status.

A parameter change is different whereby

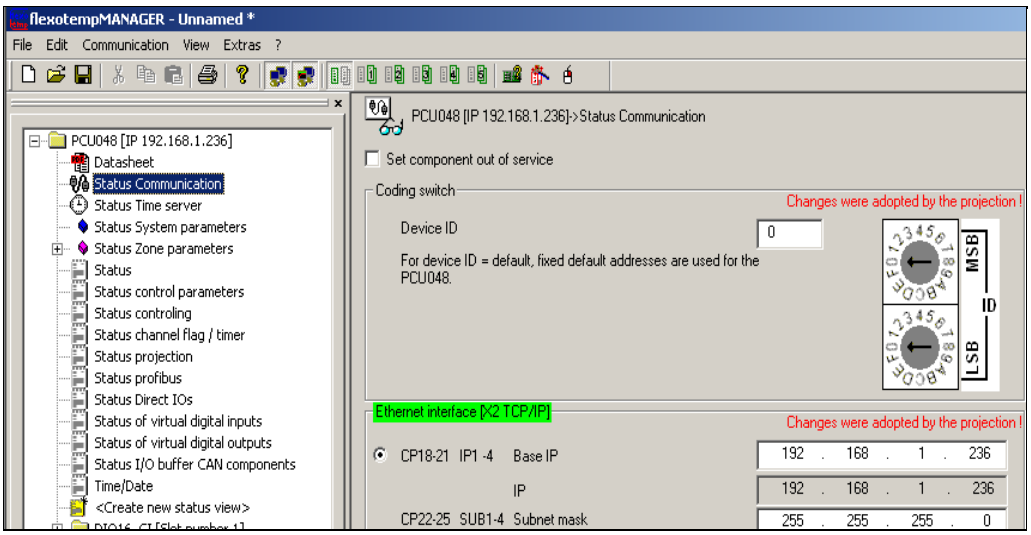
- Project - a static pre-set occurs, which is explicitly written to the controller / which must be read by the controller.
- Status - a dynamic change occurs, i.e. the controller is directly accessed online.

An exception is communication. A change in status only impacts the project for the selected communication parameters.

10.1 Status Communication

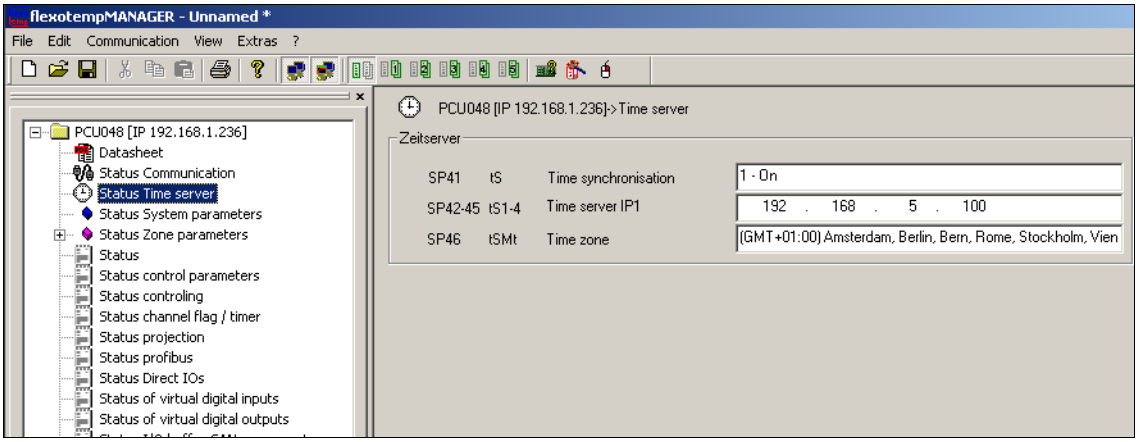
In addition, <Status Communication> view allows to define slots.

Status reads its settings from the project (see chapter ↗View communication). When changing communication parameters in <Status Communication> the currently changed parameters are written to the controller. All selected communication parameters are adopted by project setup.



10.2 Status Time Server

The <Status Timeserver> view shows the current parameter settings for the time server.



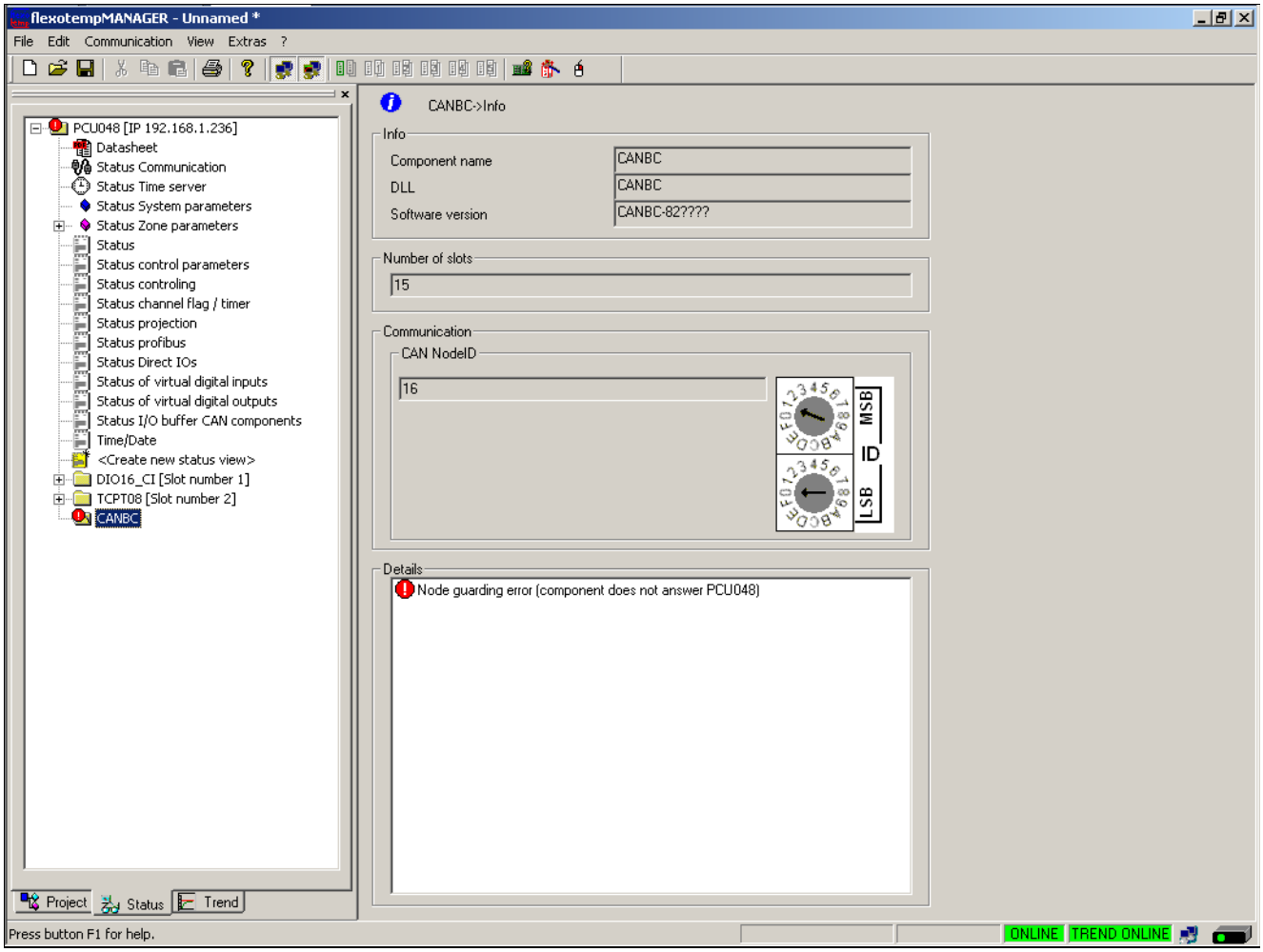
The IP address of the time server (SP42…SP45]) executing the time synchronization as well as the time zone ([SP46]) can be changed here. Also, time synchronization ([SP41]) can be turned on / off here.

10.3 Info page

When selecting the component, an information page with an additional information list is displayed that states the condition of communication within a project. Normally, this list is empty indicating that communication to the component is in order.

In the event of an error in communication, the component causing the error is marked as well as the relating master component. An error is recognized immediately and, by opening the project tree, quickly found.

The additional information list is in plain text.



flexotempMANAGER removes the indicators on the components after resolving the errors.

10.4 Parameters

Aside from the two overall views of all system and zone parameters, parameter conditions are summarized in so-called status views for better viewing purposes.

Here,

- the single component has got no or one status views (Status)
- DIO16_CI, BACI, CANCT: two status views (Status I/O, Status Zone)
- Components with identification SPL: three status views (Status I/O, Status Zone, Status SPL)
- the master component has got more than three status views and allows for the definition of own status views.

The status views have in common the display format of

- Numerical value (e.g. setpoint value, actual value, etc.) [unit, if available]
- Text (e.g. status)
- Bar (e.g. degree of operation)
- LED (red: Alarm active; green: input active)

For the master components, the status for

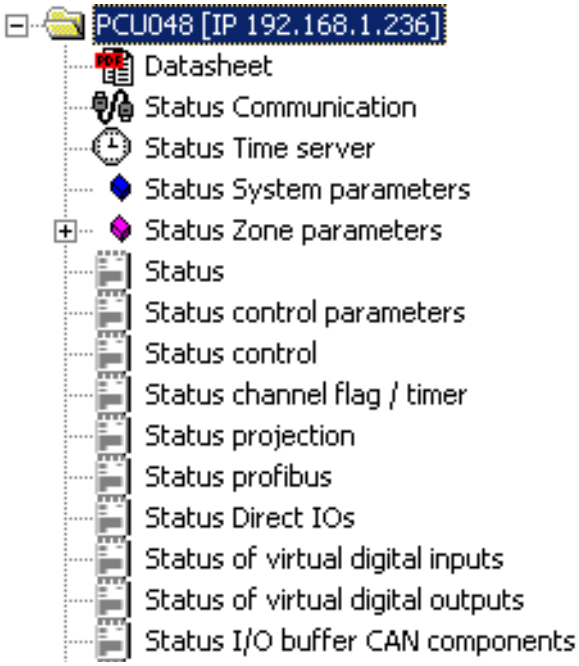
- all 8 System Inputs (green: input active)
- all 4 System Alarms (red: Alarm active)

is shown as an LED display.

10.4.1Status Display Master Component

All zones are repeatedly scanned in sequence and their conditions are updated in the status views.

The pre-defined views of the master component are:

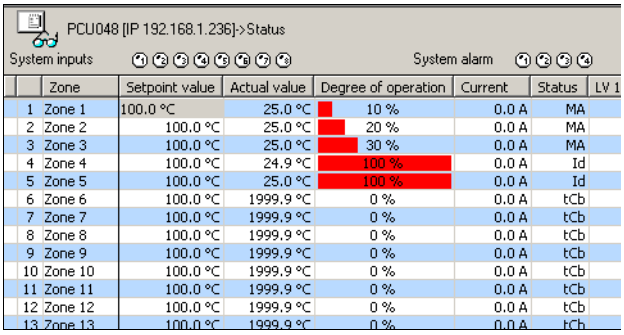


In

- ↗Status view <Status> Zone 1…n
- ↗Status view <Status control parameters> Zone 1…n
- ↗Status view <Status Controller> Zone 1…n
- ↗Status view <Status Channel flag/Timer> Zone 1…n

the following standard views are always displayed.

Display	Display Format	Parameters
>	Identification of zone currently being processed	
Sequential numbers	Zone number 1...n for identification	
Zone name	Zone name 1...n for identification	
Setpoint	Numerical value with unit	[P001] SP
Actual value	Numerical value with unit	Controlled Actual Value
Degree of operation	Numerical value with unit and bar display format	[P002] OPWR
Current	Numerical value with unit	Current
Status	Text (see chapter ↗Status controller/ Master component)	See Chapter↗Status controller/Master component

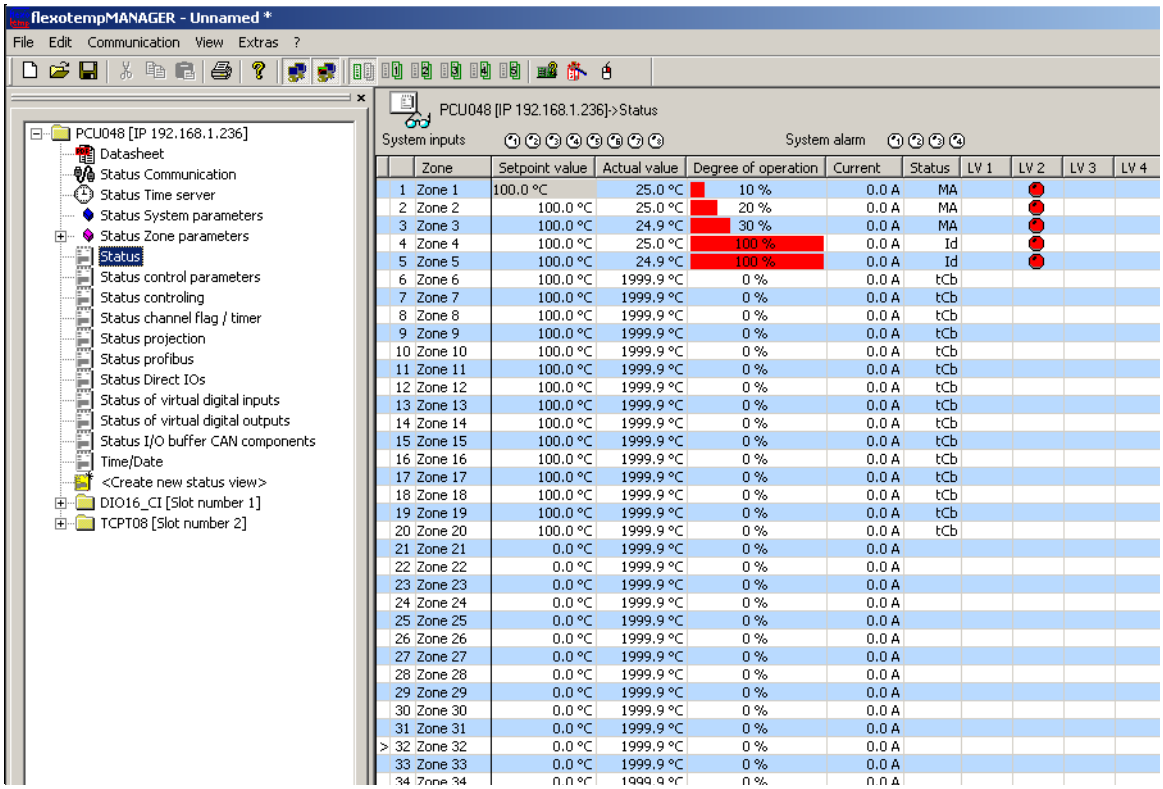


	Zone	Setpoint value	Actual value	Degree of operation	Current	Status	LV 1
1	Zone 1	100.0 °C	25.0 °C	10 %	0.0 A	MA	
2	Zone 2	100.0 °C	25.0 °C	20 %	0.0 A	MA	
3	Zone 3	100.0 °C	25.0 °C	30 %	0.0 A	MA	
4	Zone 4	100.0 °C	24.9 °C	100 %	0.0 A	Id	
5	Zone 5	100.0 °C	25.0 °C	100 %	0.0 A	Id	
6	Zone 6	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
7	Zone 7	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
8	Zone 8	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
9	Zone 9	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
10	Zone 10	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
11	Zone 11	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
12	Zone 12	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	
13	Zone 13	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	

The status views display further parameters in addition to the standard views.

For further details on parameters, please see the operating manual for temperature control system flexotempMANAGER and protocol descriptions with corresponding object lists (see chapter ↗Additional and continuative documents).

10.4.1.1 Status view <Status> Zone 1…n

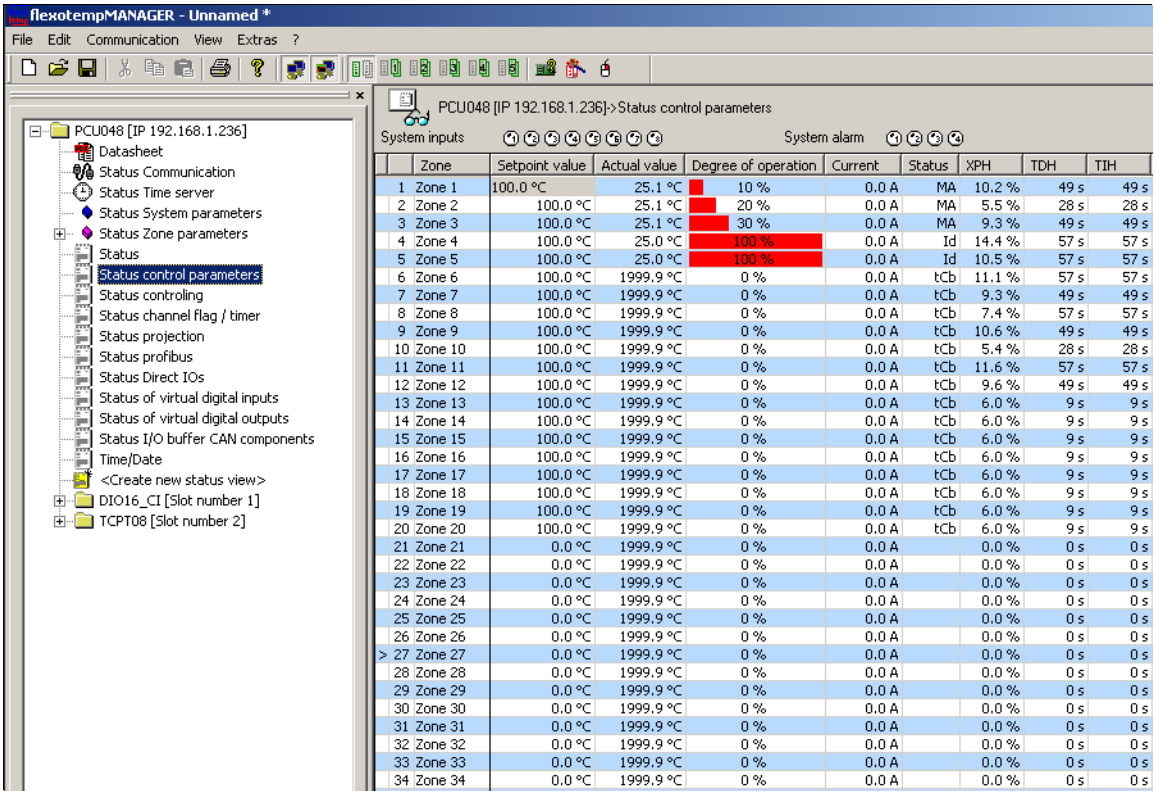


	Zone	Setpoint value	Actual value	Degree of operation	Current	Status	LV 1	LV 2	LV 3	LV 4
1	Zone 1	100.0 °C	25.0 °C	10 %	0.0 A	MA				
2	Zone 2	100.0 °C	25.0 °C	20 %	0.0 A	MA				
3	Zone 3	100.0 °C	24.9 °C	30 %	0.0 A	MA				
4	Zone 4	100.0 °C	25.0 °C	100 %	0.0 A	Id				
5	Zone 5	100.0 °C	24.9 °C	100 %	0.0 A	Id				
6	Zone 6	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
7	Zone 7	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
8	Zone 8	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
9	Zone 9	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
10	Zone 10	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
11	Zone 11	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
12	Zone 12	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
13	Zone 13	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
14	Zone 14	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
15	Zone 15	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
16	Zone 16	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
17	Zone 17	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
18	Zone 18	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
19	Zone 19	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
20	Zone 20	100.0 °C	1999.9 °C	0 %	0.0 A	tCb				
21	Zone 21	0.0 °C	1999.9 °C	0 %	0.0 A					
22	Zone 22	0.0 °C	1999.9 °C	0 %	0.0 A					
23	Zone 23	0.0 °C	1999.9 °C	0 %	0.0 A					
24	Zone 24	0.0 °C	1999.9 °C	0 %	0.0 A					
25	Zone 25	0.0 °C	1999.9 °C	0 %	0.0 A					
26	Zone 26	0.0 °C	1999.9 °C	0 %	0.0 A					
27	Zone 27	0.0 °C	1999.9 °C	0 %	0.0 A					
28	Zone 28	0.0 °C	1999.9 °C	0 %	0.0 A					
29	Zone 29	0.0 °C	1999.9 °C	0 %	0.0 A					
30	Zone 30	0.0 °C	1999.9 °C	0 %	0.0 A					
31	Zone 31	0.0 °C	1999.9 °C	0 %	0.0 A					
> 32	Zone 32	0.0 °C	1999.9 °C	0 %	0.0 A					
33	Zone 33	0.0 °C	1999.9 °C	0 %	0.0 A					

Display	**Display Format**	**Parameters** (see also ↗Status view <Status Channel flag/ Timer> Zone 1…n)
LV1…LV6	No display: deactivated; LED red: alarm active	Limit value; Channel flag 2, Bit 0 to 5
AL	No display: deactivated; LED red: alarm active	Temperature alarm; Channel flag 1, Bit 4
tCb	No display: deactivated; LED red: alarm active	Sensor break; Channel flag 1, Bit 1 or 7
tCP	No display: deactivated; LED red: alarm active	Sensor incorrect polarity; Channel flag 1, Bit 0 or 6

FAL	No display: deactivated; LED red: alarm active	Sensor short-circuit; Channel flag 1, Bit 5
I-	No display: deactivated; LED red: alarm active	Thyristor alarm; Channel flag 1, Bit 2
CTA	No display: deactivated; LED red: alarm active	Current tolerance alarm; Channel flag 1, Bit 3
INP1	No display: deactivated; LED green: input active	Zone Input 1; Channel flag 4, Bit 0
INP2	No display: deactivated; LED green: input active	Zone Input 2; Channel flag 4, Bit 1

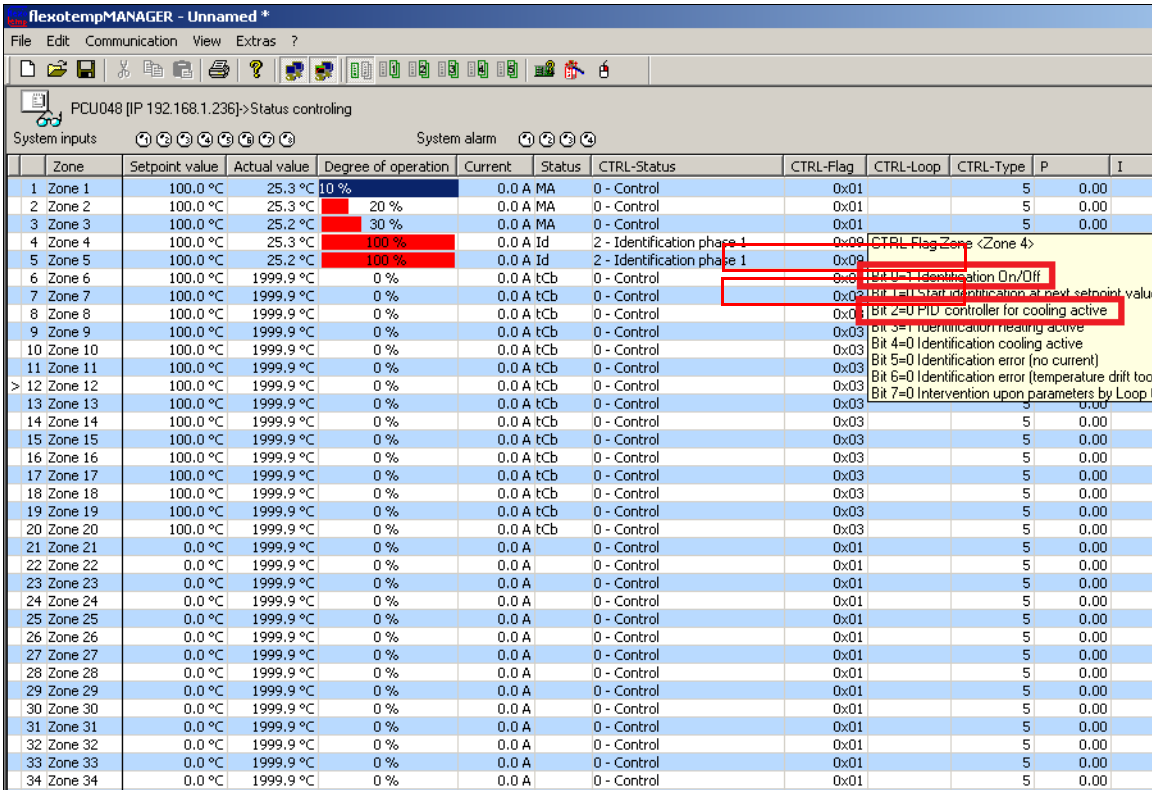
10.4.1.2 Status view <Status control parameters> Zone 1…n



Display	Display Format	Parameters
XPH	Numerical value with unit	[P042] XPH – Heating Proportional Band
TDH	Numerical value with unit	[P043] TDH – Heating Derivative Time
TIH	Numerical value with unit	[P044] TIH – Heating Integral Time
CTH	Numerical value with unit	[P045] CTH – Heating Sampling Time
XPC	Numerical value with unit	[P046] XPC – Cooling Proportional Band
TDC	Numerical value with unit	[P047] TDC – Cooling Derivative Time
TIC	Numerical value with unit	[P048] TIC – Cooling Integral Time
CTC	Numerical value with unit	[P049] CTC – Cooling Sampling Time
Active control parameter set	Text	Channel flag 6, Bit 6

Technical changes reserved

10.4.1.3 Status view <Status Controller> Zone 1…n

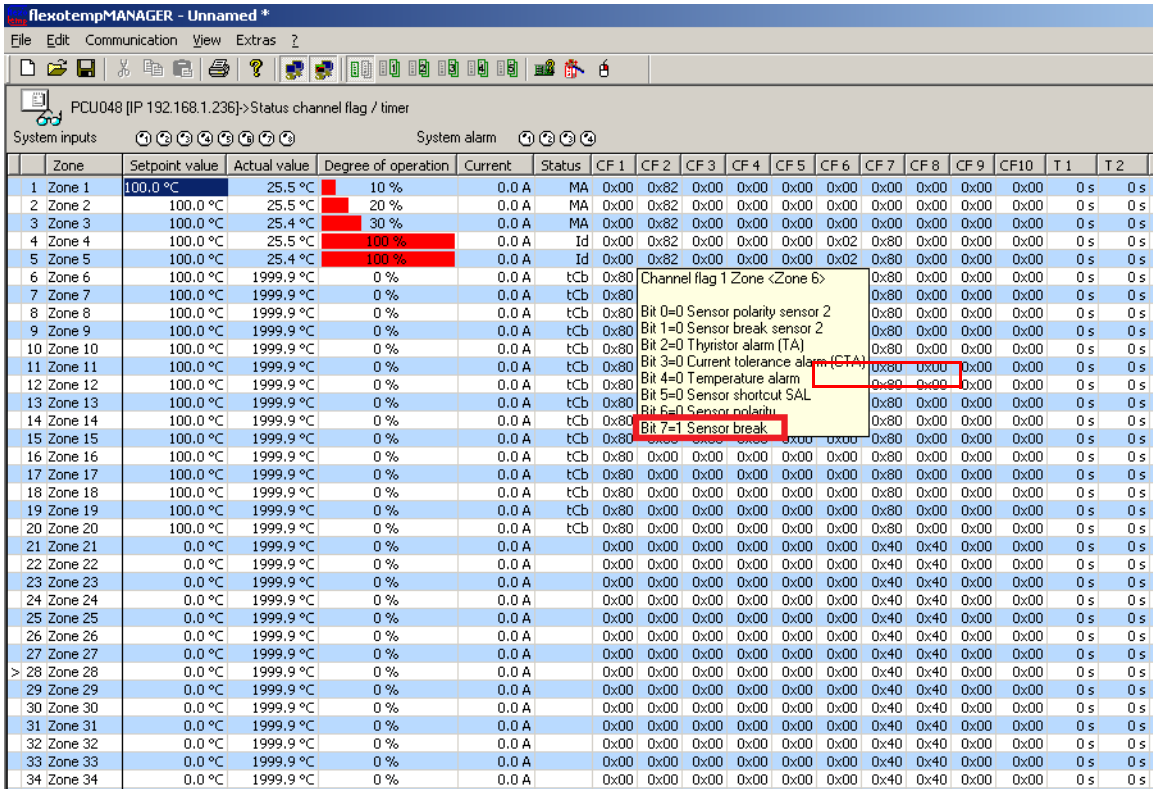


Display	Display Format	Parameters
CRTL-Status	Text	Displays the current position in the sequential chain of the algorithm: 0 - Control 1 - Identification check of temperature drift 2 - Identification phase 1 3 - Identification phase 2 4 - Identification Loop Control 21 - Cooling adaptation start phase 22 - Cooling adaptation check of temperature drift 23 - Cooling adaptation phase 1 24 - Cooling adaptation phase 2 25 - Cooling adaptation phase 3 26 - Cooling adaptation phase 4
CRTL-Flag	Text (see list of values *)	
CRTL-Loop	Text	Current value control 0 - not o.k. 10 - "" Else o.k.
CRTL-Type	Numerical value	Structure change-over controller (for servicing)
P	Numerical value	P part of controller
I	Numerical value	I part of controller
D	Numerical value	D part of controller

*) CTRL-flag and on "cursor-over" the fields containing hexadecimal number values brings up value lists specifying set bits.

Example above: Bit 0=1 and Bit 2=1. Several bits can be set at the same time.

10.4.1.4 Status view <Status Channel flag/Timer> Zone 1…n



Zone	Setpoint value	Actual value	Degree of operation	Current	Status	CF 1	CF 2	CF 3	CF 4	CF 5	CF 6	CF 7	CF 8	CF 9	CF10	T 1	T 2
1 Zone 1	100.0 °C	25.5 °C	10 %	0.0 A	MA	0x00	0x82	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0 s	0 s
2 Zone 2	100.0 °C	25.5 °C	20 %	0.0 A	MA	0x00	0x82	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0 s	0 s
3 Zone 3	100.0 °C	25.4 °C	30 %	0.0 A	MA	0x00	0x82	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0 s	0 s
4 Zone 4	100.0 °C	25.5 °C	100 %	0.0 A	Id	0x00	0x82	0x00	0x00	0x00	0x02	0x80	0x00	0x00	0x00	0 s	0 s
5 Zone 5	100.0 °C	25.4 °C	100 %	0.0 A	Id	0x00	0x82	0x00	0x00	0x00	0x02	0x80	0x00	0x00	0x00	0 s	0 s
6 Zone 6	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
7 Zone 7	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
8 Zone 8	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
9 Zone 9	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
10 Zone 10	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
11 Zone 11	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
12 Zone 12	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
13 Zone 13	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
14 Zone 14	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
15 Zone 15	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80						0x80	0x00	0x00	0x00	0 s	0 s
16 Zone 16	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80	0x00	0x00	0x00	0x00	0x00	0x80	0x00	0x00	0x00	0 s	0 s
17 Zone 17	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80	0x00	0x00	0x00	0x00	0x00	0x80	0x00	0x00	0x00	0 s	0 s
18 Zone 18	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80	0x00	0x00	0x00	0x00	0x00	0x80	0x00	0x00	0x00	0 s	0 s
19 Zone 19	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80	0x00	0x00	0x00	0x00	0x00	0x80	0x00	0x00	0x00	0 s	0 s
20 Zone 20	100.0 °C	1999.9 °C	0 %	0.0 A	tCb	0x80	0x00	0x00	0x00	0x00	0x00	0x80	0x00	0x00	0x00	0 s	0 s
21 Zone 21	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
22 Zone 22	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
23 Zone 23	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
24 Zone 24	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
25 Zone 25	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
26 Zone 26	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
27 Zone 27	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
> 28 Zone 28	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
29 Zone 29	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
30 Zone 30	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
31 Zone 31	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
32 Zone 32	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
33 Zone 33	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s
34 Zone 34	0.0 °C	1999.9 °C	0 %	0.0 A		0x00	0x00	0x00	0x00	0x00	0x00	0x40	0x40	0x00	0x00	0 s	0 s

Display	Display Format	Parameters
CF1	Numerical value (see value list*)	Channel Flag 1
CF2	Numerical value (see value list*)	Channel Flag 2
CF3	Numerical value (see value list*)	Channel Flag 3
CF4	Numerical value (see value list*)	Channel Flag 4
CF5	Numerical value (see value list*)	Channel Flag 5
CF6	Numerical value (see value list*)	Channel Flag 6
CF7	Numerical value (see value list*)	Channel Flag 7
CF8	Numerical value (see value list*)	Channel Flag 8
CF9	Numerical value (see value list*)	Channel Flag 9
CF10	Numerical value (see value list*)	Channel Flag 10
T 1	Numerical value with unit	Timer 1
T2	Numerical value with unit	Timer 2
T3	Numerical value with unit	Timer 3
T4	Numerical value with unit	Timer 4

*) Channel flag and on "cursor-over" the fields containing hexadecimal number values brings up value lists specifying set bits.

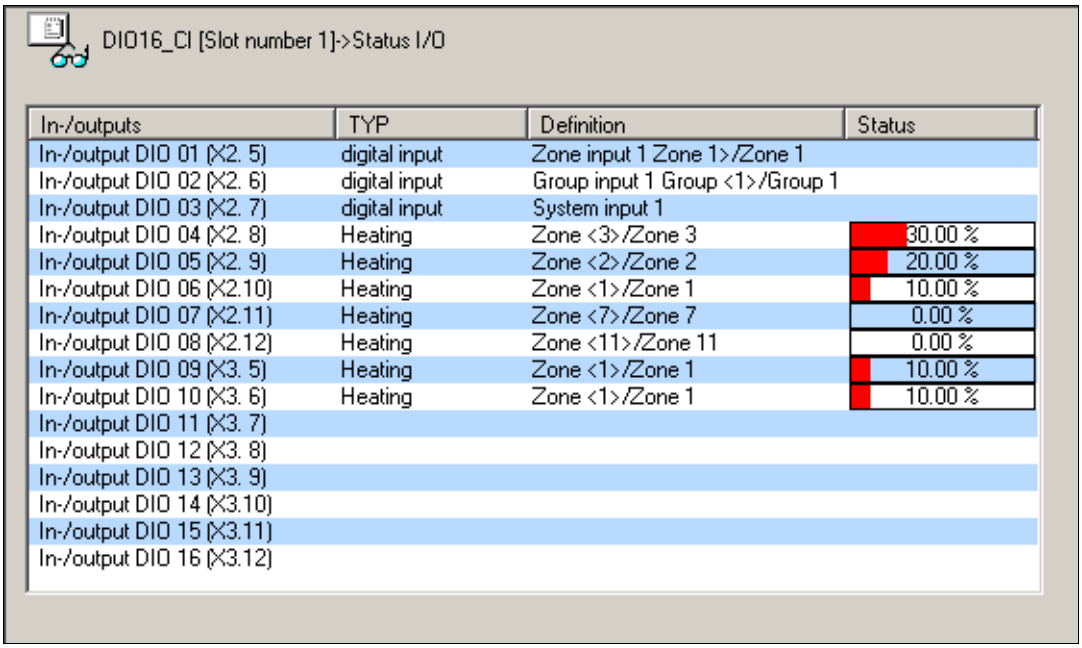
Example above: Bit 7 = 1

Several bits can be set at the same time.

10.4.2Status display on components

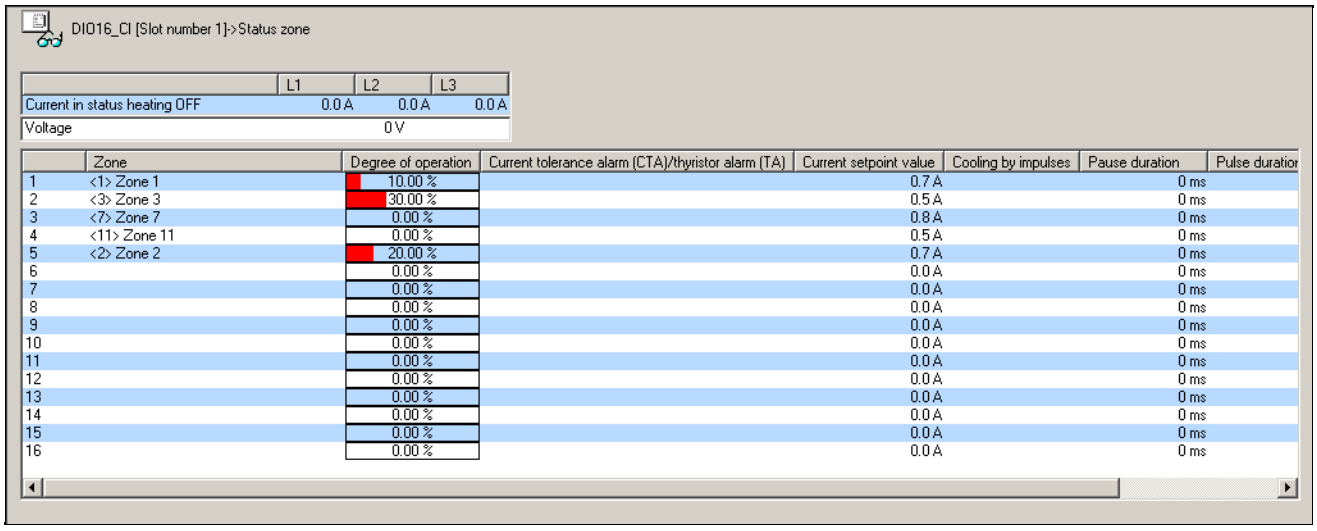
Component-relevant parameters, in-/outputs, and measured readings on the components are displayed with their status.

Status I/O displays the inputs of the component in the sequence as they are allocated on the device.



In-/outputs	TYP	Definition	Status
In-/output DIO 01 (X2. 5)	digital input	Zone input 1 Zone 1>/Zone 1	
In-/output DIO 02 (X2. 6)	digital input	Group input 1 Group <1>/Group 1	
In-/output DIO 03 (X2. 7)	digital input	System input 1	
In-/output DIO 04 (X2. 8)	Heating	Zone <3>/Zone 3	30.00 %
In-/output DIO 05 (X2. 9)	Heating	Zone <2>/Zone 2	20.00 %
In-/output DIO 06 (X2.10)	Heating	Zone <1>/Zone 1	10.00 %
In-/output DIO 07 (X2.11)	Heating	Zone <7>/Zone 7	0.00 %
In-/output DIO 08 (X2.12)	Heating	Zone <11>/Zone 11	0.00 %
In-/output DIO 09 (X3. 5)	Heating	Zone <1>/Zone 1	10.00 %
In-/output DIO 10 (X3. 6)	Heating	Zone <1>/Zone 1	10.00 %
In-/output DIO 11 (X3. 7)			
In-/output DIO 12 (X3. 8)			
In-/output DIO 13 (X3. 9)			
In-/output DIO 14 (X3.10)			
In-/output DIO 15 (X3.11)			
In-/output DIO 16 (X3.12)			

Zone status displays the zones ranged on the components in their project setup sequence.

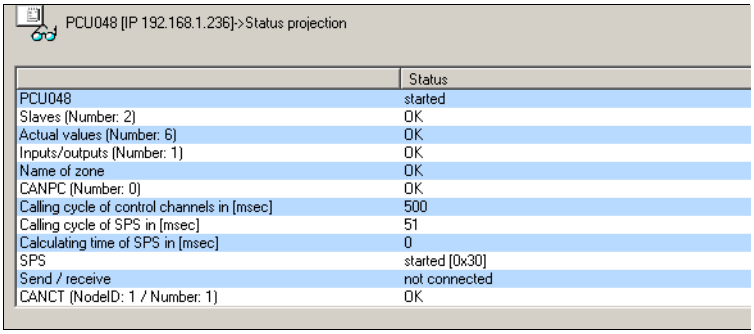


	L1	L2	L3
Current in status heating OFF	0.0 A	0.0 A	0.0 A
Voltage		0 V	

	Zone	Degree of operation	Current tolerance alarm (CTA)/thyristor alarm (TA)	Current setpoint value	Cooling by impulses	Pause duration	Pulse duration
1	<1> Zone 1	10.00 %		0.7 A		0 ms	
2	<3> Zone 3	30.00 %		0.5 A		0 ms	
3	<7> Zone 7	0.00 %		0.8 A		0 ms	
4	<11> Zone 11	0.00 %		0.5 A		0 ms	
5	<2> Zone 2	20.00 %		0.7 A		0 ms	
6		0.00 %		0.0 A		0 ms	
7		0.00 %		0.0 A		0 ms	
8		0.00 %		0.0 A		0 ms	
9		0.00 %		0.0 A		0 ms	
10		0.00 %		0.0 A		0 ms	
11		0.00 %		0.0 A		0 ms	
12		0.00 %		0.0 A		0 ms	
13		0.00 %		0.0 A		0 ms	
14		0.00 %		0.0 A		0 ms	
15		0.00 %		0.0 A		0 ms	
16		0.00 %		0.0 A		0 ms	

10.5 Status project setup

<Status Project setup> provides an overview of the components, call- and computation cycles, connected to the master component.



	Status
PCU048	started
Slaves (Number: 2)	OK
Actual values (Number: 6)	OK
Inputs/outputs (Number: 1)	OK
Name of zone	OK
CANPC (Number: 0)	OK
Calling cycle of control channels in [msec]	500
Calling cycle of SPS in [msec]	51
Calculating time of SPS in [msec]	0
SPS	started [0x30]
Send / receive	not connected
CANCT (NodeID: 1 / Number: 1)	OK

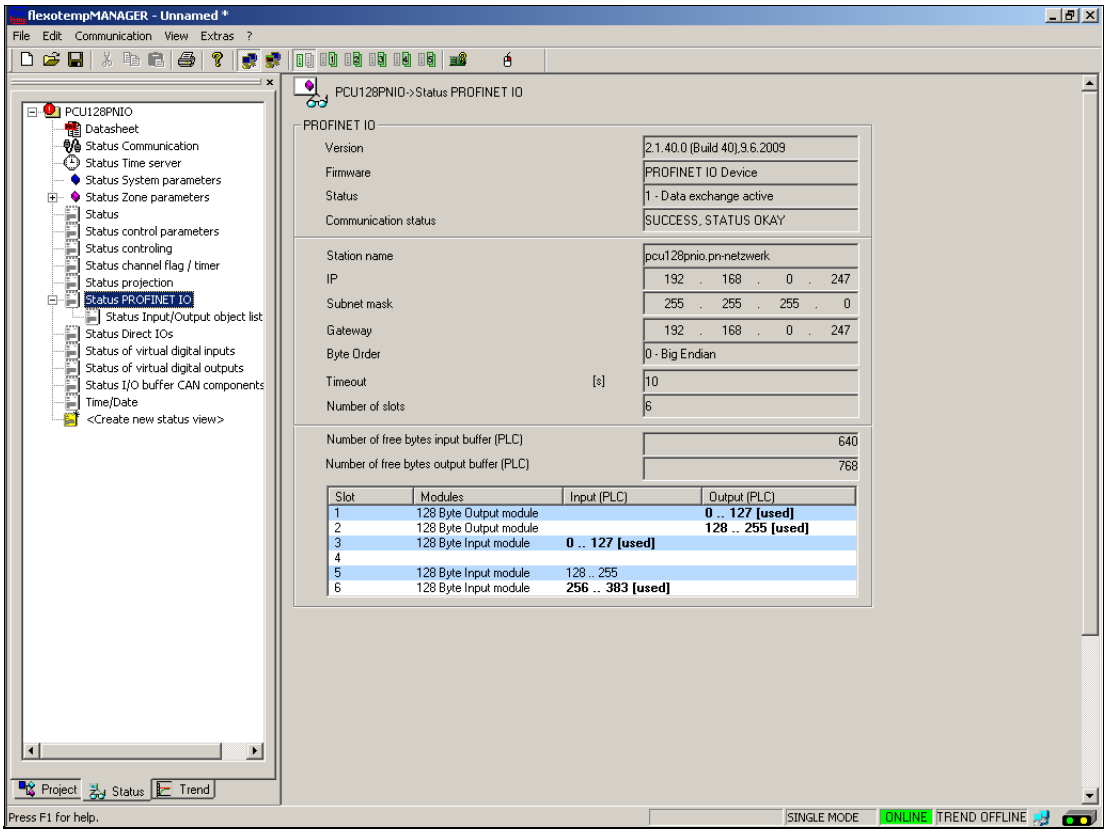
10.6 Status Profibus

<Status Profibus> displays the input and output buffers of Profibus DP, respectively Profibus DPEA (communication parameter [CP13] DPEA – Profibus DPEA-protocol = ON) that are managed by the controller (Project setup and configuration see chapter ↗Communication by PROFINET IO).

If the <SIO ON> key is activated, the buffers are no longer controlled by controls, but solely by flexotempMANAGER. For details, please see protocol description Profibus DP, respectively Profibus DPEA (see chapter ↗Additional and continuative documents)

10.7 Status PROFINET IO

If a master component with abbreviation "PNIO" is employed, <Status PROFINET IO> displays communication settings as well as the in-/output buffers of PROFINET IO that are managed by controls (Project setup and configuration see chapter ↗Communication by PROFINET IO).



Communication settings PROFINET IO

- Version, Firmware of master component
- Possible status

	Status-message	Meaning
0	PROFINET IO not yet initialized	Before an initialization PROFINET IO is not operable. Wait until initialization is ready.
1	Data exchange active (with control)	The data is exchanged by bus. In a cyclical data exchange the input - and/or output data is transferred between PROFINET IO controller and PROFINET IO device.
2	Data exchange not active (with control)	The data is not exchanged by bus. The PROFINET IO device has been paused by the user program or had to go due to a bus error to the Stop state.
3	Initialization active (of master component)	The initialization is in progress. Wait.
4	PROFINET IO reset active (of master component)	A reset is executed. Wait.

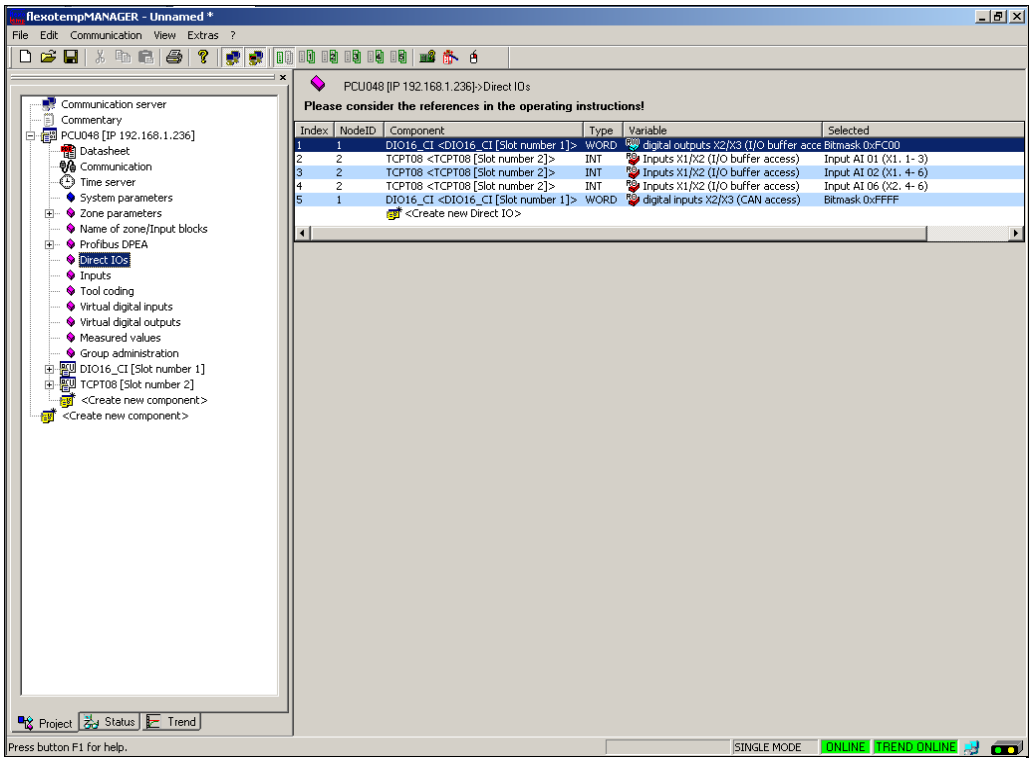
- Communication status for example:
  - SUCCESS, STATUS OK
  - CABLE DISCONNECT (controls off)
- Station name (Settings in <Project> <PROFINET IO> and controls)
- IP, Subnet mask, Gateway settings set by controls
- byte sequence
- Timeout (all outputs are set to passive upon expiration of the time in seconds set here. If set to 0, the function is deactivated.)
- Number of slots, number of free bytes in-/output buffer (SPS), slot display (Settings in <Project> <PROFINET IO> and controls).

If the <SIO ON> key is activated, the buffers are no longer controlled by controls, but solely by flexotempMANAGER. For details, please see protocol description PROFINET IO (see chapter ↗Additional and continuative documents).

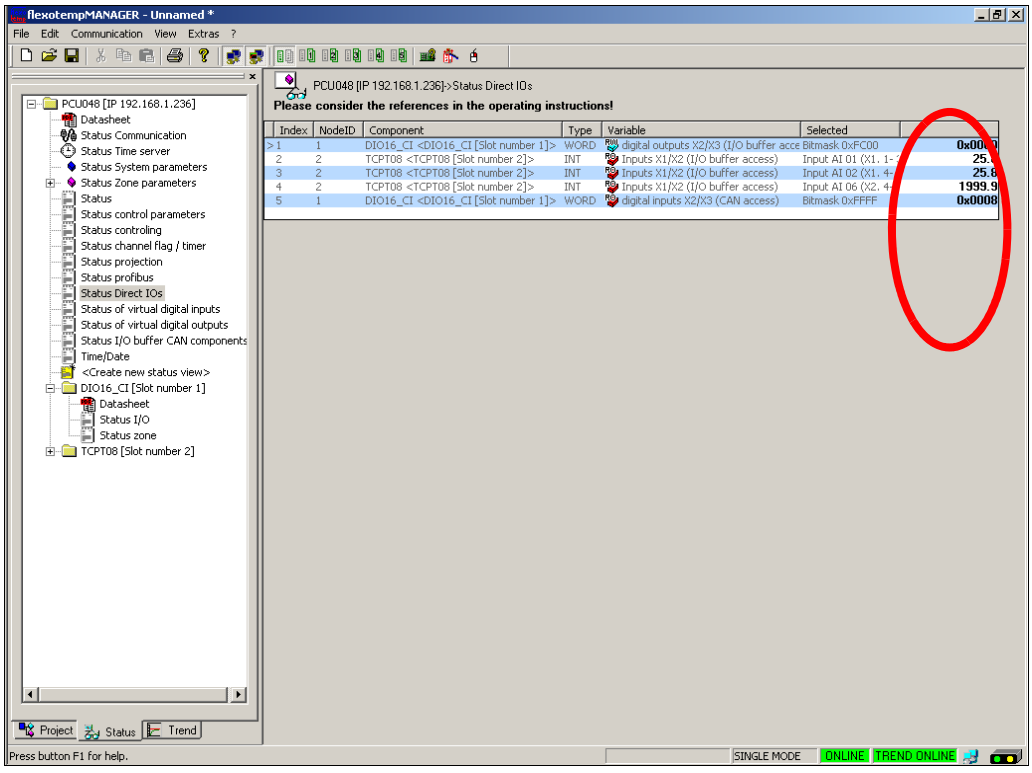
10.8 Status Direct IOs

Change to Status to see the current values of the Direct IOs.

The table of variables of Direct IOs compiled in the |Project| window via <Direct IOs>...

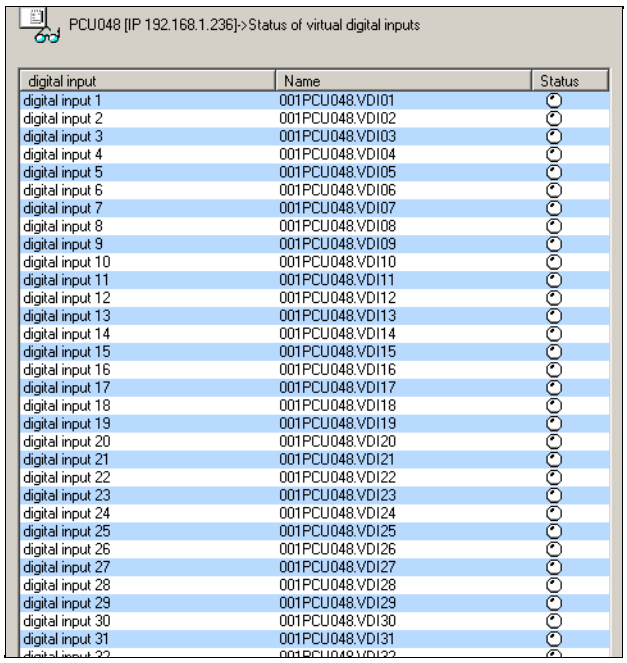


.. provides the following display in the |Status| window



10.9 Status virtual digital inputs

If virtual inputs are used, the condition of virtual digital data inputs can be viewed here (LED green: input active).

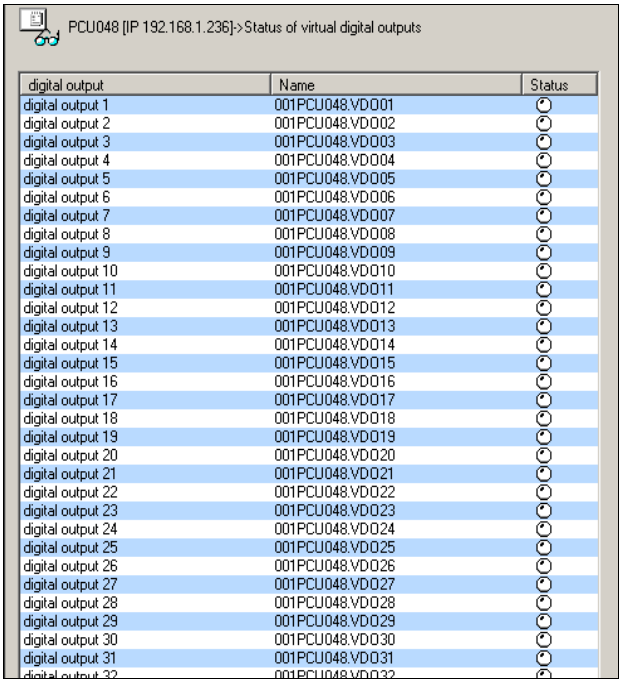


digital input	Name	Status
digital input 1	001PCU048.VDI01	
digital input 2	001PCU048.VDI02	
digital input 3	001PCU048.VDI03	
digital input 4	001PCU048.VDI04	
digital input 5	001PCU048.VDI05	
digital input 6	001PCU048.VDI06	
digital input 7	001PCU048.VDI07	
digital input 8	001PCU048.VDI08	
digital input 9	001PCU048.VDI09	
digital input 10	001PCU048.VDI10	
digital input 11	001PCU048.VDI11	
digital input 12	001PCU048.VDI12	
digital input 13	001PCU048.VDI13	
digital input 14	001PCU048.VDI14	
digital input 15	001PCU048.VDI15	
digital input 16	001PCU048.VDI16	
digital input 17	001PCU048.VDI17	
digital input 18	001PCU048.VDI18	
digital input 19	001PCU048.VDI19	
digital input 20	001PCU048.VDI20	
digital input 21	001PCU048.VDI21	
digital input 22	001PCU048.VDI22	
digital input 23	001PCU048.VDI23	
digital input 24	001PCU048.VDI24	
digital input 25	001PCU048.VDI25	
digital input 26	001PCU048.VDI26	
digital input 27	001PCU048.VDI27	
digital input 28	001PCU048.VDI28	
digital input 29	001PCU048.VDI29	
digital input 30	001PCU048.VDI30	
digital input 31	001PCU048.VDI31	

The functionality is only required in connection with CoDeSys-Soft-SPS.

10.10Status virtual digital output

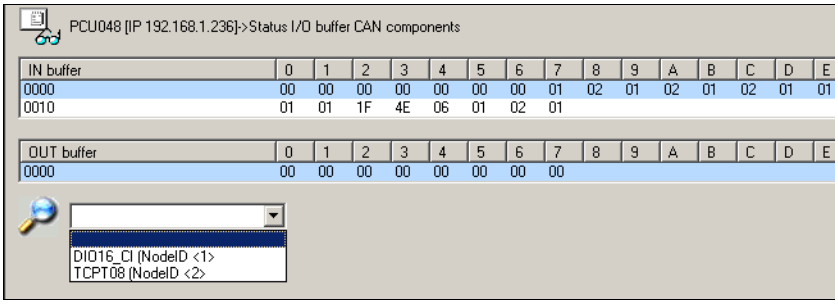
If virtual outputs are used, the condition of virtual digital data outputs can be viewed here (LED green: output active).



The functionality is only required in connection with CoDeSys-Soft-SPS.

10.11Status I/O buffer CAN components

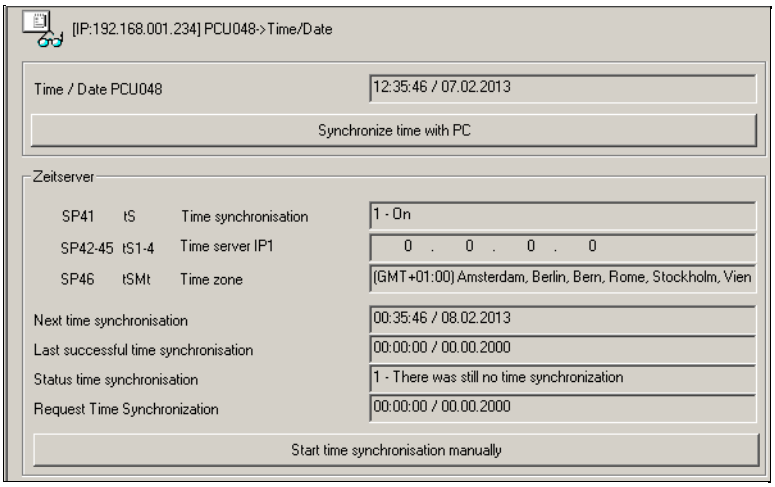
Function for purposes of servicing



The magnifying lens function allows to display the status of components in the lower area of the display.

10.12Date / Time

The date / time of the master component can be synchronized with the PC running flexotempMANAGER, respectively via the time server.



The key for <Initiate time synchronization manually> is only visible if time synchronization ([SP41]) is active (see chapter ↗Status Time Server).

Under Date/Time the information of the time server are shown.
The status of the time synchronization can show the following conditions:

- 0- Time synchronization o.k.
- 1 - There was still no time time synchronization
- 2 - Time synchronization triggered
- 3 - Time synchronization request sent
- 4 - Time synchronization message error receipt
- 5 - Time synchronization invalid time received
- 6- Time synchronization Timeout

11 Trend

The graphical display of analog and discrete values in form of a trend is available for

- any object
- any status
- any value

The database view offers the display of ONLINE-/ OFFLINE data sets. In files stored snap-shots can be called up every time and be displayed.

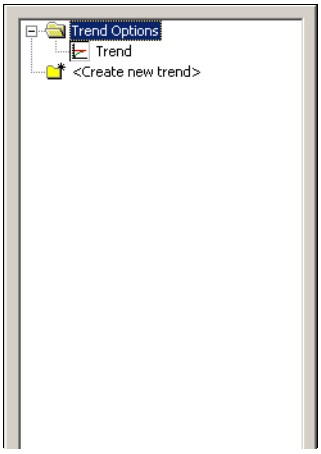
The poling cycle for the trend can be set under menu bar → <Extras> <Options> <System> (see chapter ↗Menu Bar Extras).

Menu bar → <View> <Project> Register <Trend>

Show trend

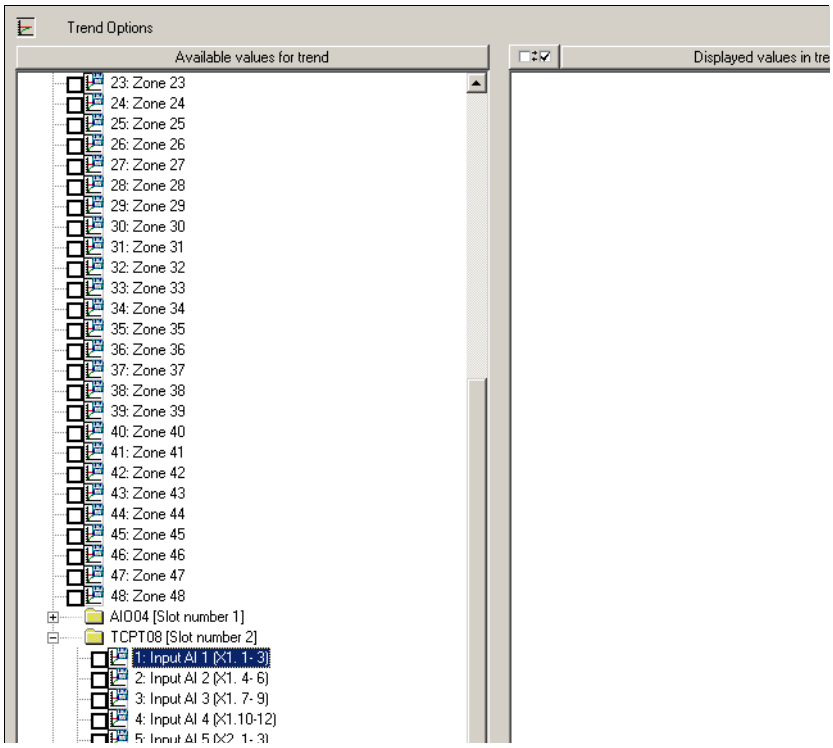
Menu bar → <View> <Project>, Register <Trend>

Trend



At change to <Trend> the so called trend options can be set for the displayed project, and/or for an already existing definition the trend could be immediately displayed.

Trend options



By <Available values for trend> zones can be selected for the controller, which display

- the setpoint value
- the degree of operation and/or the effective degree of operation *)
- the current
- the output value proportion for PID controller

of the selected zones.

What is displayed is shown in the window <Displayed values in trend>.

[*) effective degree of operation, when component DIO16_CI_SPL, and/or CANCT_SPL is configured]

At all other components depending on their existence

- Analog inputs (AI)
- Analog outputs (AO)
- Digital inputs (DI)
- Digital outputs (DO)
- Leakage current
- Power supply input
- Measurement input

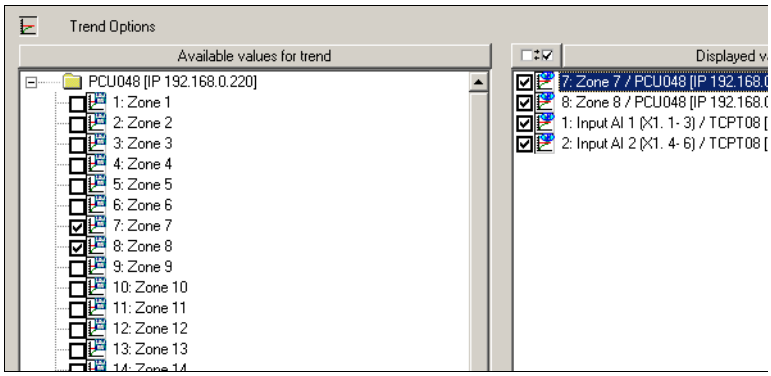
can be displayed.

32 objects (e.g. setpoint value of a zone = one object) are simultaneously displayed.

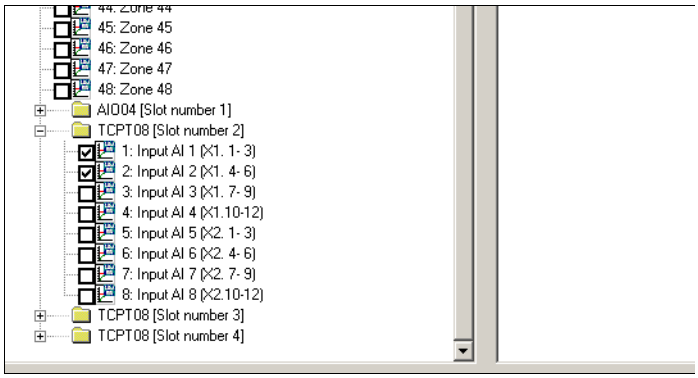
Is more than one digital in-/-output (display Low/High) displayed, offsets are used, that all trends are visible.

Only the data for the selected zones and inputs AI are transferred and displayed from the controller to the flexotempMANAGER.

Trend options



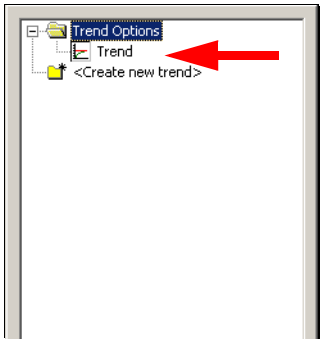
...



In the example here the zone 1 and 2 of the controller PCU048 and the analog input of the component AIO04 are selected for the display in the trend.

By the menu item <Trend> all selected parameters are displayed.

The visibility of all selected values displayed in the trend, can quickly be activated /deactivated by this key



If you are on the regulation process online with the graphics window, the display is displaced to the left similar to an analog measurement recorder.

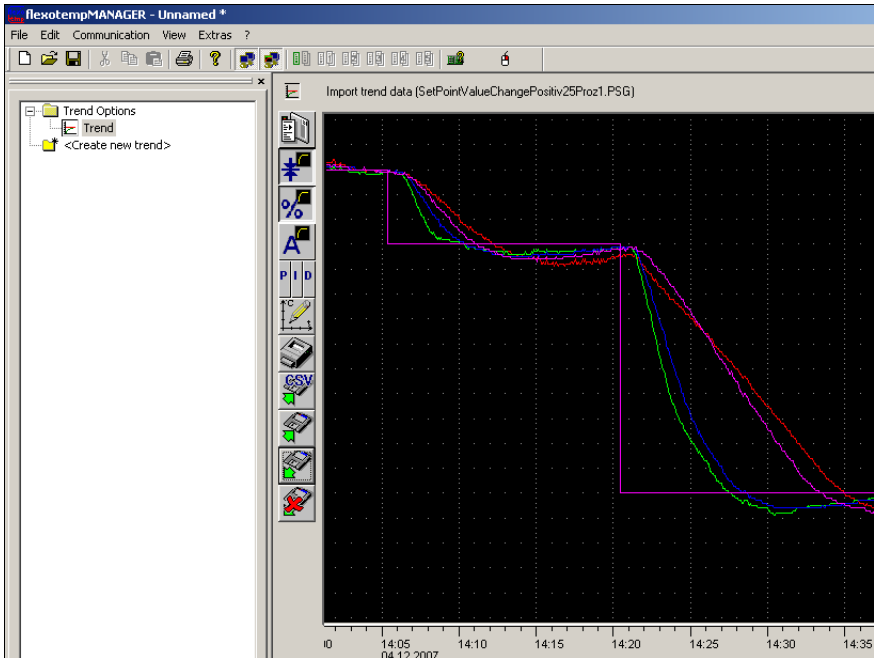


Illustration 1 Exemplary trend display (setpoint value, degree of operation shown)

11.1 Menu keys for trend

By the key LEGEND (SHOW/HIDE) the current values of the parameters can be displayed for

"Setpoint

"Actual value

"Degree of operation

"Zone names

"PID

By the menu TREND SETTINGS the displayed parameters are selected. The display shows per zone the curve in the color on the right screen page.

By means of the SETPOINT VALUE key (SHOW/HIDE), the setpoint value is displayed in the trend.

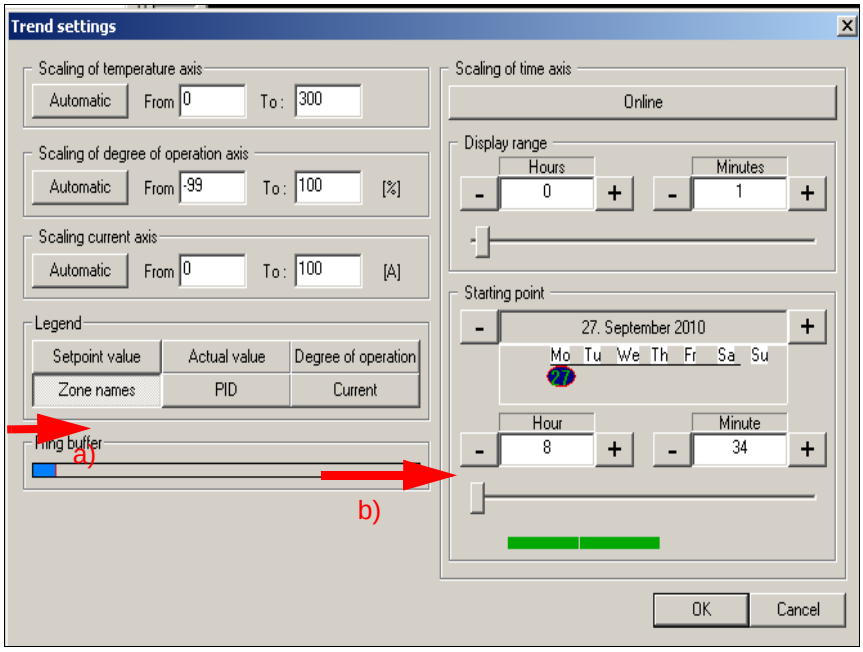
If the key DEGREE OF OPERATION (SHOW/HIDE) is activated, a window is shown below the setpoint/actual value plot with the plot of the degree of operation.

If the key CURRENT (SHOW/HIDE) is activated, a window is shown below the setpoint/actual value plot with the plot of the current.

As soon as the key P-, I-, or D-proportion (SHOW/HIDE) is activated, the window that displays the degree of operation is shown. The respective P-, I-, D-proportion can be shown/hidden with the degree of operation.

Over the TREND key one can reach a dialog box.

Should the data of the database view be shown (ONLINE/OFFLINE), the starting point and the display range, as well as the parameters displayed in the legend, can be defined. The axes scaling can be manually stipulated for temperature, degree of operation and current or the automatic scaling is left to flexotempMANAGER.

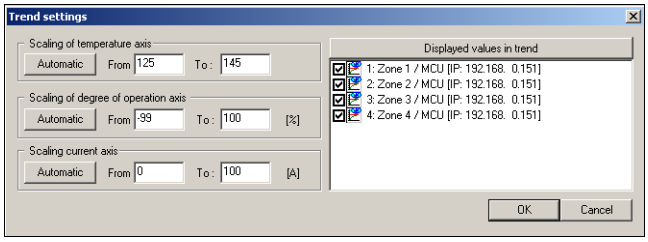


The ring buffer a) shows the degree of filling of the database, that collects the trend data.

With the scroll bar b) positions in the database can be indexed, where data for the trend display (green bar) is available.

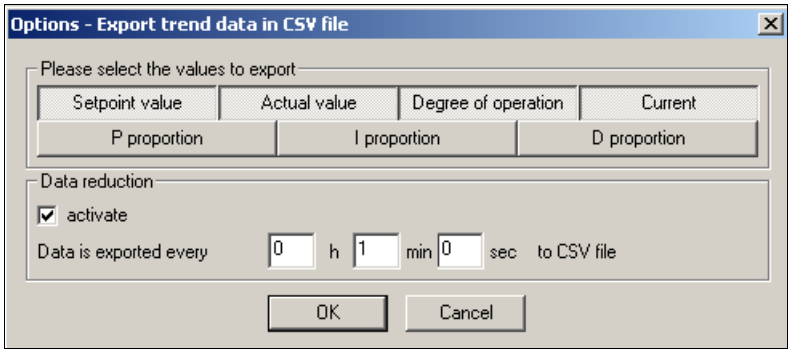
Over the TREND key one can reach a dialog box.

When a file was imported, the axes scaling can only be manually stipulated for temperature, degree of operation and current or the automatic scaling is left to flexotempMANAGER.



By the key PRINT TREND DATA a dialog boy is opened. System printers are offered in a list.

By the key EXPORT TREND DATA IN CSV FILE, the visible data in the trend window (comparable with screen shot) is written in a CSV file and is stored to a selectable directory on disk.



Before storing the data, the operator is asked by menu, which data he wants to export and whether a data reduction should be executed. Is data reduction selected ☑, a time pattern in the form of H:M:S (hour:minute:second) must be set.

In the example here the by trend collected data (setpoint value, actual value, degree of operation, current) is exported every 1 minute into the CSV file.

By the key EXPORT TREND DATA, the visible data in the trend window (comparable with screen shot) is written in a trend graphic file (file extension PSG, proprietary file format of flexotempMANAGER) and is stored to a selectable directory on disk.

By the key IMPORT TREND DATA stored trend graphic files (file extension PSG) are read from a selectable directory from disk and displayed as trend in the flexotempMANAGER.

By the key HIDE IMPORTED TREND DATA, the display of data from an imported trend graphic file can be ended and the display returns to display of data from the database view.

By this key the display jumps to the first data set of the database view.

By this key the display scrolls stepwise in direction to the first data set of the database view.

By this key the display scrolls stepwise in direction to the last data set of the database view.

By this key the display jumps to the last data set of the database view.

12 Components

All available components in flexotempMANAGER are listed here with data sheet, order number. In the window |Project| they could be

- connected by the menu item <Create new component>
- taken per drag&drop out of the window |Components|

The selection lists, that open, in the window |Project|, only offer components, which are compatible in this place.

Menu bar → <View> <Components>

Master	**Controller and open loop control units**
PCU024	
PCU048	
PCU128	
MCU 128	
PCU024PNIO PCU048PNIO PCU128PNIO	Master components with mnemonic “PNIO“ can be accessed by protocol PROFINET IO.
PT_DC PT_DC_USB PT_CUR	Only the master component can be created, no allocation of further components possible. Import project into flexotempMANAGER e.g. by see chapter ↗Menu Bar: File - SCAN (see documentation on profi-TEMP)
PCU024HA PCU048HA PCU128HA	The master components marked with (*HA) are used for application Home Automation. This affects temperature control in rooms with infrared heating elements.
ETR132PNIO ETR112PNIO	Details on this component see separate operating instructions.
HPCBC	Details on this component see separate operating instructions.
MPI 05 PNIO	Master component with mnemonic “PNIO“ can be accessed by protocol PROFINET IO.
PCU.web	Details on this component see separate operating instructions.

CAN	**CAN- (bus coupler modules, I/O modules)**
CANVT	To the CAN components
CANTC12	"CANBC can PCU-
CANTC 24	"CANCT and CANCT_SPL can RS485-
CANPC03	"HPCBCCAN can HPC-
CANPC06	components be connected.
CANPC12	
CANAIN08 CANIO08 CANBC CANCT CANCT_SPL <Import new EDS file>	For the use of CANopen devices, are electronic data sheets, so called EDS files, necessary. These files, written in a standardized text format, describe the most important parameters of the objects of the object directory of the device as well, as physical parameters like e.g. supported baud rates. flexotempMANAGER can import EDS files by the menu item <Import new EDS file> and communicate with the corresponding device and parameterize it, if necessary (see chapter ↗Integration of a CAN slave)
PT_BC	Internal used, not assignable;

Menu bar → <View> <Components>

PCU	**PCU- (bus coupler modules, I/O modules)**
AIO04 TCPT08 TC12 PT08 PT12 PT16 DIO16_CI DIO16_CI_SPL DO16 BACI DO08R VC02 VC04 MPI02 CANBE HC06_16	To the PCU component ■ BACI can RS485-components be connected.
CANBEG	Only for PCUXXXPNIO
PT_WKZ	Internal used, not assignable;

HPC	**HPC-Components**
HPC24	

RS485	**RS485- (I/O modules PSG output bus)**
SMV04 SMAO04 SMA09G SMA09 SMA08 SMA06G MC08 MA08 MA08K	

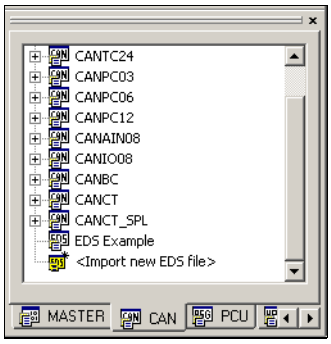
12.1 Integration of a CAN slave

For integration of a CAN slave the following has to be done.

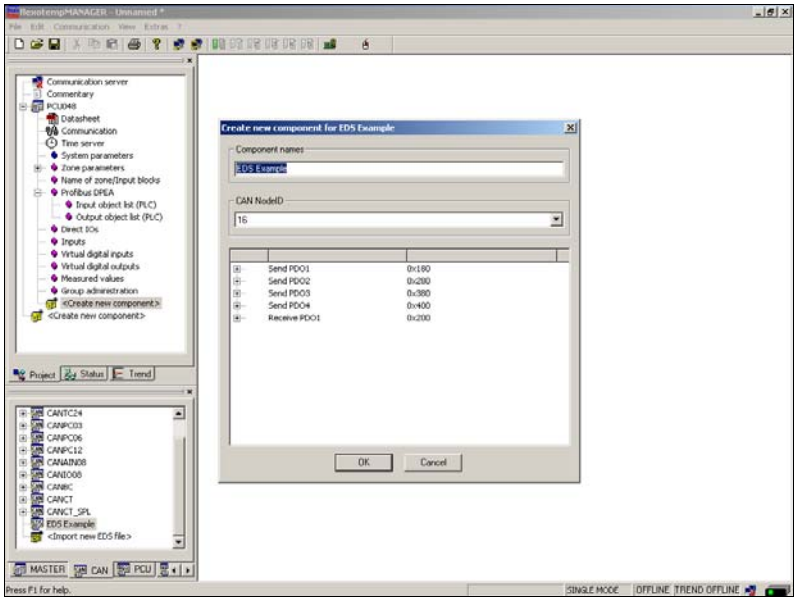
Put EDS file (here **example.eds**) of the CAN slave in the directory
Installation directory → flexotempMANAGER → EDS

Start flexotempMANAGER **NEW**

The CAN slave is now visible under menu bar → <View> <Components> <CAN>



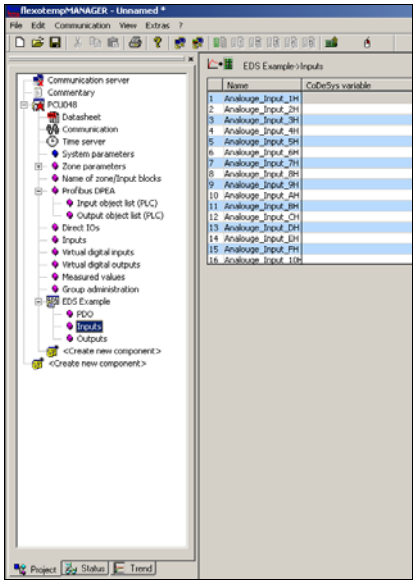
Select CAN slave and integrate it in project setup



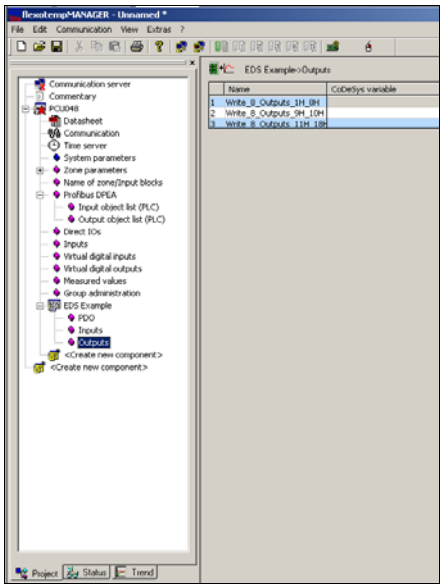
Already at integration in the project, the CAN slave shows the send and receive PDO's, that are available.

Now CoDeSys variables can be assigned to the in-/outputs of the CAN slave

Inputs



Outputs



The project setup has to be written into the MCU/PCU (see chapter ↗Context menu for master components)

The variable list of CoDeSys can be exported (see chapter ↗Context menu for master components)

The export file can be imported in a CoDeSys project.

13 Data recording

The function data recording offers the recording of zone parameters, system parameters, communication parameters and process parameters.

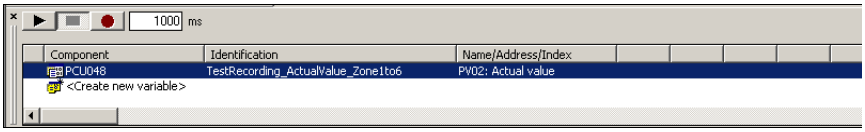
Zone parameters, system parameters and communication parameters can be found under the controller under menu item → <View> <Project> register <Project>, process parameters under Register <Status>.

13.1 Start recording

Menu bar → <View> <Data recording>

Select recording

First, an entry must be selected out of the list.



Is no entry available, see chapter ↗Create new variable for data recording.

Set scanning frequency

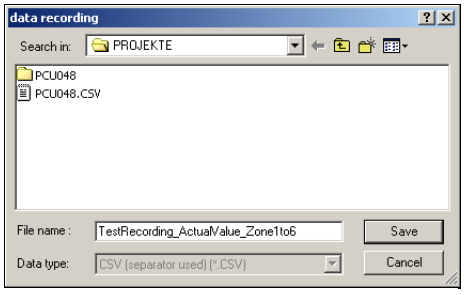
The scanning frequency of the values can be adjusted. Standard is 1000 ms.

a) Start recording on file

The recording of the selected variable on file, has to be started by .

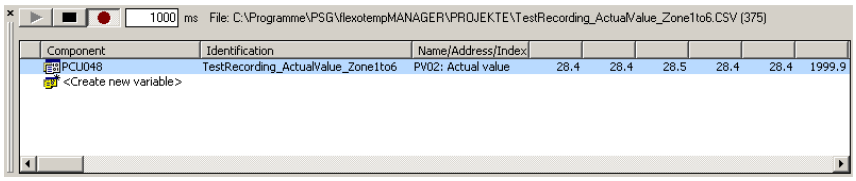
Enter recording file

The name of the CSV file, where the data is stored and that is saved on disk, has to be specified and confirmed by <Save>.

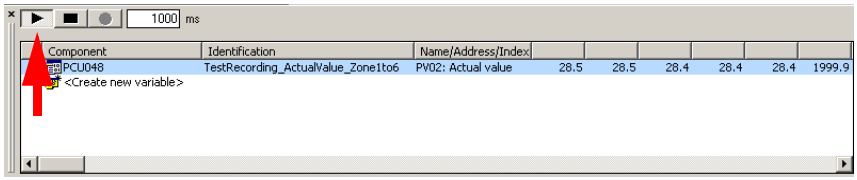


Menu bar → <View> <Data recording>

Recording on file is running	The selected data is displayed in the window and is stored to the file, specified in the header. After the file name, the size of the file is displayed in brackets.



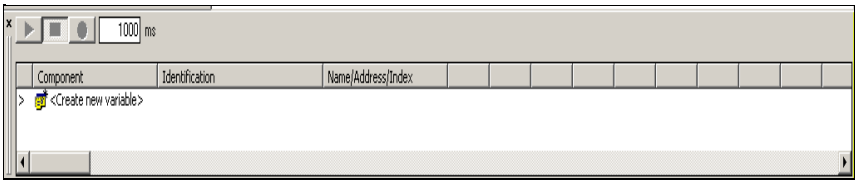
b) Start recording interactive	The recording of the selected variable has to be started by . The selected data is only displayed in the window.



Stop recording	The recording is active, as long as the operator does not stop it by .

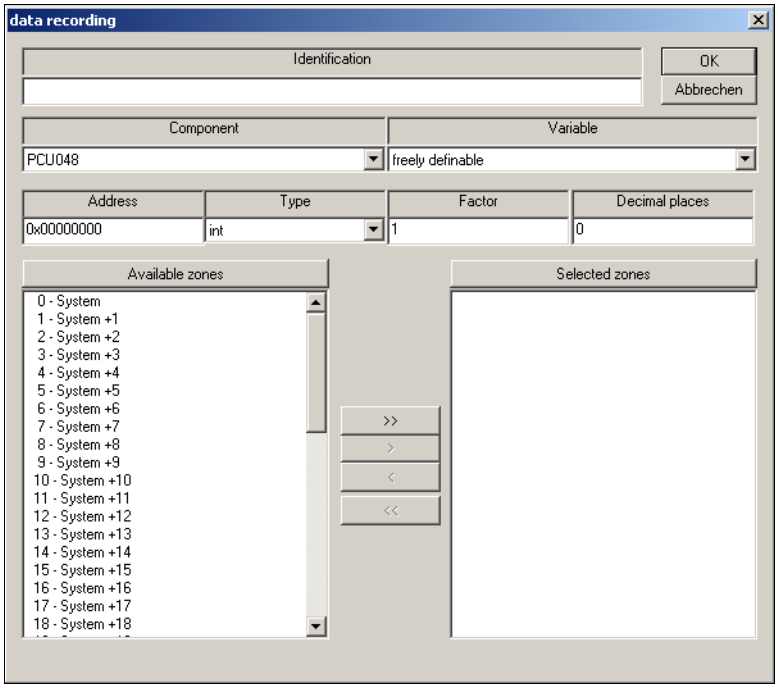
13.2 Create new variable for data recording

Menu bar → <View> <Data recording>

Start data recording	

Specify settings for recording	Select <Create new variable>. The following window opens.

Menu bar → <View> <Data recording>



The function only runs, when a project is displayed. Otherwise the message <No component available> occurs under <Components> and there are no further entries possible.

Identification — Free entry of an identification for the data recording (e.g. TestRecording_ActualValue_Zone1to6)

Component — All components, which are in-use in the project, where a logging is available, can be selected for logging.

Variable — All variables, of the selected component, where a logging is available, can be selected for logging.

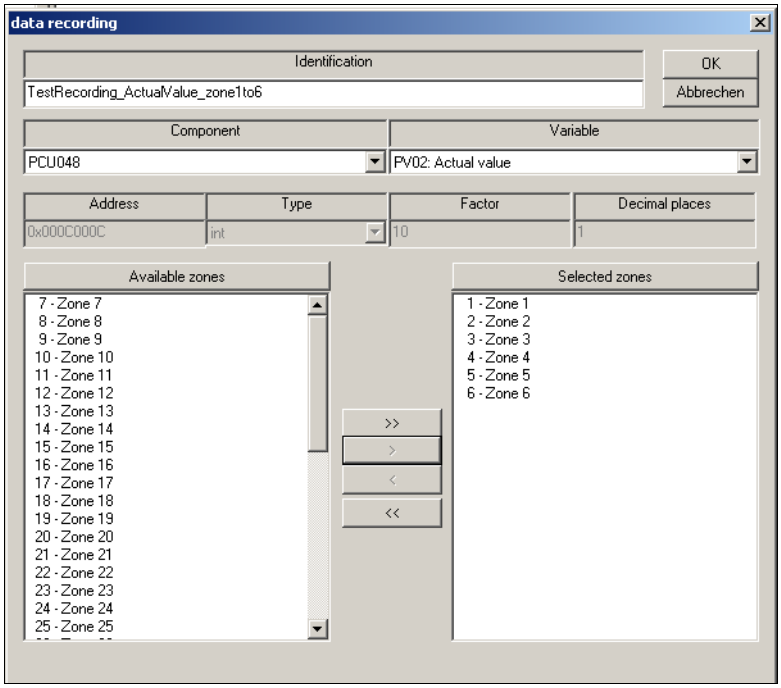
Is the variable <Freely definable> chosen, the variable can be specified by address, type, factor and decimal place (specialist function).

Available zones/Sub indexes — All available zones/sub indexes are displayed due to the settings above. Out of these zones/sub indexes, all can be selected by >> or single can be selected by > and transferred to the field <Selected zones> and/or <Selected sub indexes>.

Indexes of CANopen are used for communication with CAN I/O's. Each object is identified by index (variable name defines the index) and sub index.

Menu bar → <View> <Data recording>

Specify settings for recording

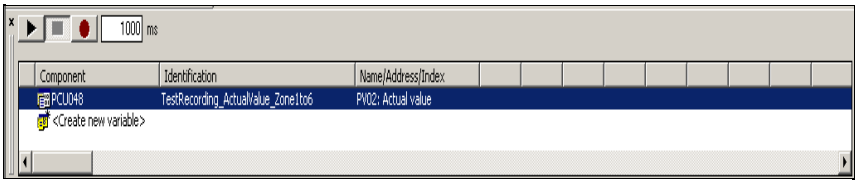


In the present example with the identification **TestRecording_ActualValue_Zone1to6**, the zone parameter: PV02: actual value for the zones 1 … 6 is selected for the component PCU048. The data is presented in the window in decimal format.

Per data recording only one variable of a component can be selected for the maximal available zones/indexes.

Save settings for recording

After confirmation by <OK>, the settings for the recording in the window, marked with the used component (including pictogram) and the entered identification, appear.



14 Template

A complete project or a master component with all allocated components can be saved as a template in flexotempMANAGER and be imported for faster project setup / configurations.

Via

- Menu bar → <File> <Save> and/or <Save as…> a project is created (*1)
- Context bar on project level → <Create template> the Master component is created (*2)

as a template on the hard disk under

Installation directory → flexotempMANAGER → PROJECTS (*1)
Installation directory → flexotempMANAGER → CONF (*2)

in XML-format.

If the template is imported into flexotempMANAGER it can be added to an active project.

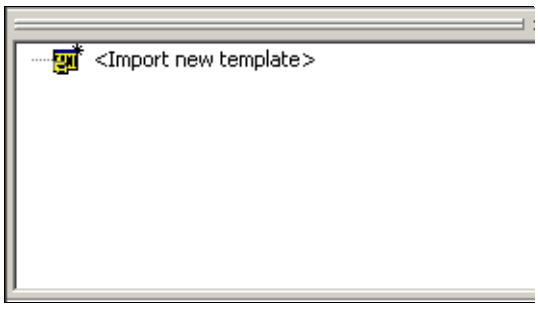
Menu bar → <View> <Template>

If files are already stored under
Installation directory → flexotempMANAGER → CONF, and/or via a menu bar → <Extras> <Options> <Directories> <Work group template> defined path, they are displayed in template view. Continue with <Activate template>.

The <Work group template> path can be used not only to locally save project templates on a PC, but also to import from central servers within the company. . flexotempMANAGER saves templates upon creating on the above paths (*1, *2). From there, for purposes of central use, the files must be copied to the path that is specified under <Work group templates>. For differentiation, the files receive a prefix in <View> <Template> whether it is a locally saved file (CONF ***) or a centrally saved file (TEAMCONF ***).

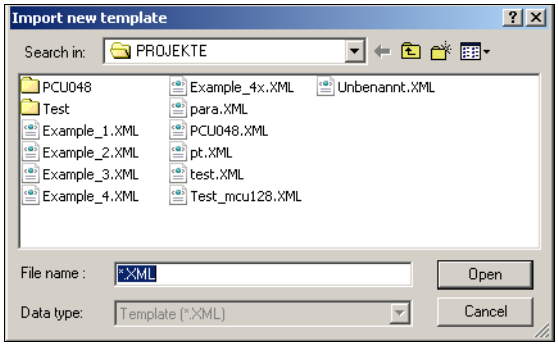
If no templates are available

Select menu item



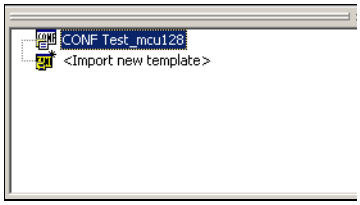
Menu bar → <View> <Template>

<Import new template>



Select a project as template from the list

In this example <**Test_mcu128.XML**> is selected as a template.



A copy of <Test_mcu128.XML> is created in Installation menu → flexo-tempMANAGER → CONF and displayed in the window as available template <CONF Test_mcu128>.

Activate template

Upon selecting, the template can be dragged from the |Template| window and dropped in the |Project| window.

15 Appendix

15.1 Connection status flexotempMANAGER to PSGCommServer

The following status reports are displayed in the PSGCommServer display (communications server) (also see chapter ↗Communication concepts of flexotempMANAGER).

Displayed status	Causes / Diagnoses
Server connection o.k.	No error
Server connection terminated	Communication with server is OFFLINE
Cannot identify server name	Check if correct server name was entered at communications server.
Error creating socket	Check network connection
Error connecting server	Check if PSGCommServer process running
No socket available	Check network connection
Server has terminated connection	Check if server was stopped manually or if PC is running on the server

15.2 Connection status interface to controller

The connection-status-interface-to-controller display in the status bar can display the following conditions. It does not matter whether the controller is connected via Ethernet, CAN or the serial interface. The type of available interface is available on the communications server.

green LED left	The last executed action (for example read parameters) was successful.
red LED left	The last executed action (for example read parameters) was not successful.
yellow LED right	Access to the interface is displayed

15.3 Status controller/Master component

Possible status in the status views of master components.

Status are prioritized as only one status can be displayed. The status of the highest priority (first in list below) is displayed. If this status is no longer valid the status of the next lower priority is displayed.

Status information is arranged for a 7-segment display and can be displayed in the zone display.

Status	Meaning	Meaning and error correction
MA	Manual mode	
tCp	Sensor incorrect polarity	Sensor connection interchanged. Change the sensor wire + and – of the corresponding zone.
tCb	Sensor break	Defective sensor. In order to keep on operating zones in the standard operating mode, replace sensors immediately. Otherwise switch zones into manual mode or leading zone mode and keep on working with defect sensor.
IdE	Error at identification	
dri	Drift error report during identification phase	Signal during beginning of the identification phase possible. Disappears by itself. After that zone changes into identification phase with signal Id.
Id	Heating identification active	
IdC	Cooling identification active	
IdS	Starting phase identification cooling	
AL	Alarm measuring range exceeded	Actual value of the zones has exceeded the measuring range's upper limit or the maximum temperature (500°C). Error is stored and must be confirmed. If the error report appears prior to error report I-, a defect of the solid state relay of the zone is possible. Please replace. Also:Error on sensor possible. Please observe actual value. Contact manufacturer
rAP	Manual temperature ramp active	
SP2	Reduction to 2nd setpoint value	
SP3	Reduction to 3rd setpoint value	
SP4	Reduction to 4th setpoint value	
bSt	Boost function active (relative setpoint value increase)	
SbY	Temperature reduction/standby active (relative setpoint value increase)	
StA	Startup operation active	If the controller is in startup operation mode, the remaining startup time (in minutes) is displayed alternately with the current message,
FAL	Sensor alarm	

Technical changes reserved

Status	Meaning	Meaning and error correction
LiO	Actuator deactivated	
Out	Zone switched off	
CoU	Leading zone manual mode	
ArE	Automatic ramp error	
ArE.	Automatic ramp error (slowest zone)	
Ar	Automatic ramp	
Ar.	Automatic ramp (slowest zone)	
CAn	CAN communication fault (CANAIN)	Possible sources of errors: Address setting or setting of transmission speed do not match at the devices or defective CAN interface. Contact manufacturer
CtC	Error configuration (CANCT Configuration)	The configuration table in the master component and in the connected sub components (z.B. baci, dio16ci, canct, do16, etc.) does not match.
Ctb	Error PSG bus (RS485 on CANCT Bus)	Bus error (e.g. on baci, canct, etc.) to actuator modules. See connectors of components.
ERR	Fault in channel data	Change to parameter level, change a value and confirm the change. The error message disappears. Alternatively enter code number 950.
SYS	Error in system data	
PrO	Learning phase process control active	
PAL	Process alarm	
Cur	Leakage current error	
Pot	Potential error on the sensor	
MAG	Group manual mode	
dIE	Diagnostics end	
dIA	Diagnostics active	
dEr	Diagnostics error	
I-	Thyristor alarm (TA)	A heating current is measured although the solid state relay is not control-activated by the controller. Check solid state relay and replace.
FUS	Short on the heating output	Wiring error, error is stored and must be confirmed.
PhA	Phase error	At least one mains network phase is missing.
HSE	Heat Sink Error	Heat sink temperature too high.
GPO	Bypass group release	
GP	Zone waits for group release	
GPL	Zone waits for group release	… and controls on standby values until then.

Status	Meaning	Meaning and error correction
010	Read MMC error	
011	Write MMC error	
LdE	Load Error	Error when loading hex file via MMC card.
Ld	Load	Loading hex file over MMC card active.

15.4 Access via Direct IOs

The access of Direct IOs by

- CAN-Bus
- Ethernet
- Profibus
- PROFINET IO
- CoDeSys

occurs via the respective read-/write command and the respective index in the Direct IO table (see chapter ↗Direct IOs table). Please see below for further details and where relevant information can be found.

15.4.1Access via CAN-Bus

The Direct IOs are addressed via SDO (data type long) via object 0x2200 and 0x2201.

The subindex of the objects is the same as the index in the Direct IOs table

Indexes 1...255 are addressed via object 0x2200 and indexes 256...300 are addressed via object 0x2201 (here the subindex over index -255 occurs).

Read Direct IO 5 from master component with NodeID 32 (0x20)

	Message	Length	Data							
S	620	8	40	00	22	05	00	00	00	00
A	5A0	8	43	00	22	05	00	00	00	00

Read Direct IO 1 from master component with NodeID 32 (0x20)

	Message	Length	Data							
S	620	8	40	00	22	01	00	01	00	00
A	5A0	8	43	00	22	01	28	01	00	00

Set over Direct IO 5 digital port 2 and 9 on the component

	Message	Length	Data							
S	620	8	2B	00	22	05	02	01	00	00
A	5A0	8	60	00	22	05	00	00	00	00

15.4.2Access via Ethernet

Access via Ethernet ASCII currently not possible.

Two additional commands were implemented via Ethernet binary:

- Read Direct IOs: Command 0x0010
- Write Direct IO: Command 0x0011

15.4.3Access via Profibus

See chapter ↗Communication by Profibus and protocol description Profibus DP and Profibus DPEA (see chapter ↗Additional and continuative documents).

15.4.4Access via PROFINET IO

See chapter ↗Communication by PROFINET IO and protocol description PROFINET IO (see chapter ↗Additional and continuative documents).

15.4.5Access via CoDeSys

Two library commands exists for access via CoDeSys (for further documentation see chapter ↗Additional and continuative documents).

15.5 Software version of components

The software version (also HEX-File) is marked as follows

kk	identifier for HEX-File
xx	Week
yy	Year
z	Index

15.6 Version History

Version	Date	Changes
1.04.11	8/28/2015	Amendments of operating manual to flexotempMANAGER Software version 1.03.05 In detail, the following amendments were made: ■ PROFINET IO meaning for status messages added; amendments for DIOs ■ Components added ■ Display Operating instructions (when existing) ■ Chapter ARP added ■ MPI05PNIO separate operating instructions
1.04.10	4/17/2014	Amendments of operating manual to flexotempMANAGER Software version 1.02.26 In detail, the following amendments were made: ■ Time synchronization Status 6 added ■ New components amended ■ CtC, CtB specified ■ Restore factory setting added
1.04.09	7/26/2013	Amendments of operating manual to flexotempMANAGER Software version 1.02.24 In detail, the following amendments were made: ■ Display of Ethernet scan ■ Out of service -> Communication for this component out of service ■ Selection for Write parameter ■ Option color „Color when status deviates from project“ added ■ Option system „Save selected input block with component change“ added
1.04.08	2/6/2013	Amendments of operating manual to flexotempMANAGER Software version 1.02.20 In detail, the following amendments were made: ■ Function software version revised ■ "For service purposes only" added ■ Data sheet display ■ Number of virtual in-/outputs raised to 64 ■ Date/Time time synchronization with time server ■ Context menu item store/restore parameter image added ■ Selection path for HEX-Files
...	...	...
1.00.00	2008-07-18	First edition Meusburger Deutschland GmbH Voltastrasse 2 68519 Viernheim Germany Tel. +49 6204 6069 0 www.meusburger.com office-de@meusburger.com

Technical changes reserved