



TM923

Диагностика и Сервис с Automation Studio



Обзор Automation Studio

Настройка онлайн подключения

Получение системной информации

Настройка и поведение системы при исполнении

Создание и анализ переменных процесса

Встроенные методы диагностики приводов

Диагностика интегрированной системы безопасности





Обзор



Start Page / Getting Started

Примеры проектов

Краткие руководства

Последние проекты

Getting Started

B&R Sample Projects...



[B&R Coffee Machine](#)



[Application Basis Project](#)



[Temperature Controller Basis Project](#)

How do I...



[Work with Automation Studio?](#)



[Create a control project?](#)



[Create a visualization?](#)



[Create a motion application?](#)

See also...



[Getting Started section in the Automation Studio Help](#)





Рабочая область

The screenshot shows the Automation Studio interface with the following components highlighted by numbered callouts:

- 1**: The **Object Tree** (Objektbaum) on the left, showing the project structure including **CoffeeMachine**, **Global**, **mainlogic**, **ConveyorBelt**, **conv_ini**, **conveyor**, **conveyorCyclic**, **conveyor.var**, **BrewingAssembly**, **FeederArm**, **FlowHeater**, **Recipes**, **Visualisation**, and **Libraries**.
- 2**: The **Text Editor** (Text Editor) in the center, showing the **PROGRAM_CYCLIC** code with comments and a ladder logic diagram.
- 3**: The **Toolbox** (Katalog) on the right, showing the **Basisfunktionen** (Basic Functions) category with various function blocks like **ABS**, **Access**, **ACOS**, **Action**, **ADD**, **Address contact**, **ADR**, **AND**, **AsArLogClear**, **AsArLogCreate**, **AsArLogDelete**, **AsArLogGetInfo**, **AsArLogRead**, **AsArLogWrite**, **ascDT**, **ascDTStructure**, and **ascTIME**.
- 4**: The **Output Window** (Ausgabe) at the bottom left, which is currently empty.
- 5**: The **Properties Window** (Eigenschaftensfenster) at the bottom right, which is currently empty and displays the message: "Die aktive Ansicht oder die gewählten Elemente haben keine anzeigbaren Eigenschaften." (The active view or the selected elements have no displayable properties).





Встроенная справочная система

B&R Help Explorer - Automation Studio 4.0.15.47

File Edit View Tab Help

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Help Contents

- Automation software
 - Automation Studio - Start page
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 - Software installation
 - Getting started
 - Working in Automation Studio
 - Creating programs in Automation Studio
 - Creating a visualization application in Automation Studio
 - Creating a motion application in Automation Studio
 - Diagnostics in Automation Studio
 - Creating an OPC configuration in Automation Studio
 - Getting started with ANSI C++
 - Creating a safety application in Automation Studio
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 - Motion
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 - Communication
 - Real-time operating system
 - Hardware
 - Solutions
 - Visualization

Automation software

Clicking on the hotspots embedded in the overview image open up additional information concerning that topic.

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Fertig



Разделы менеджера проекта

The screenshot displays the Automation Studio interface with two main views: Logical View and Configuration View. The Configuration View is active, showing a tree of project objects. A context menu is open over the 'Add Configuration...' option, with an orange arrow pointing to it. The 'Logical View' and 'Configuration' tabs at the bottom are circled in orange.

Logical View

Object Name

CoffeeMachine

- Doc
- Software
- B&RC
- B&RC
- Global.typ
- Global.var
- mainlogic
- ConveyorB
- BrewingAss
- FeederArm
- acp_e
- motor
- motor
- feed_i
- feeder
- fe
- fe
- FlowHeater
- Recipes
- Visualisation
- Visu
- visCtrl
- visAla
- visTre
- VisuW

Configuration View

Configuration	Batch	Description
Simulation		Set as Active Configuration
		Open with Explorer
		Open with - Editor
		Add Configuration...
		Add Object...
		Cut
		Copy
		Paste
		Delete
		Rename
		Move Up

Hardware.hw

Hardware.hwl

ARsim

PP400based [Active]

Hardware.hw

Hardware.hwl

PP420

X20_and_VNC

Hardware.hw

Hardware.hwl

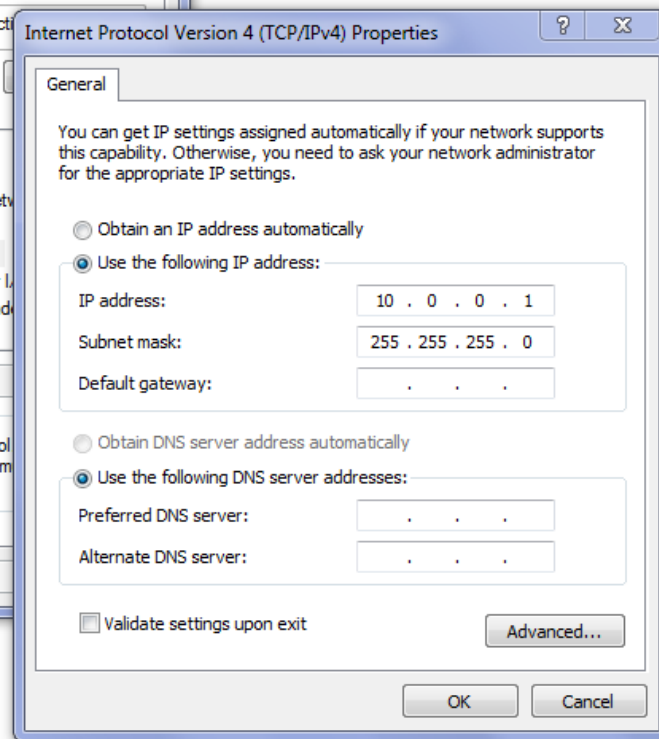
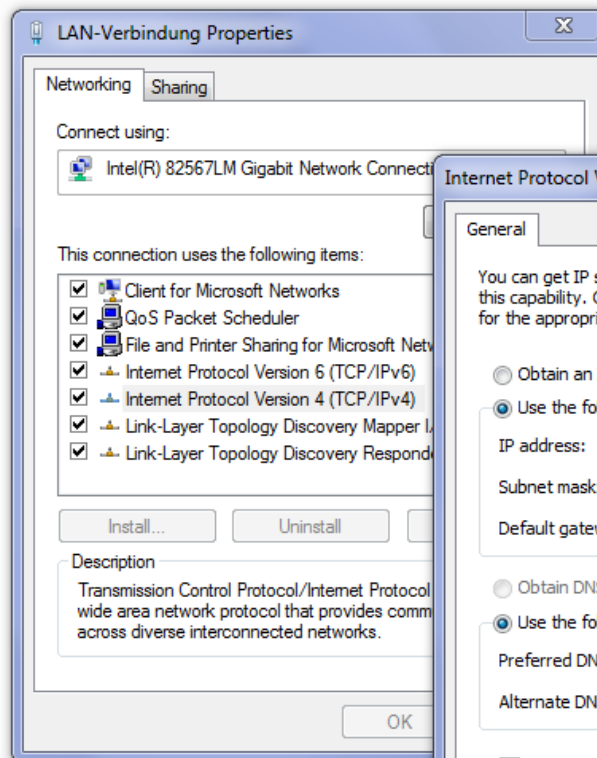
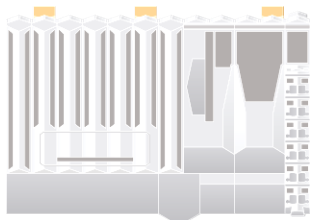
PP500



Настройка онлайн подключения

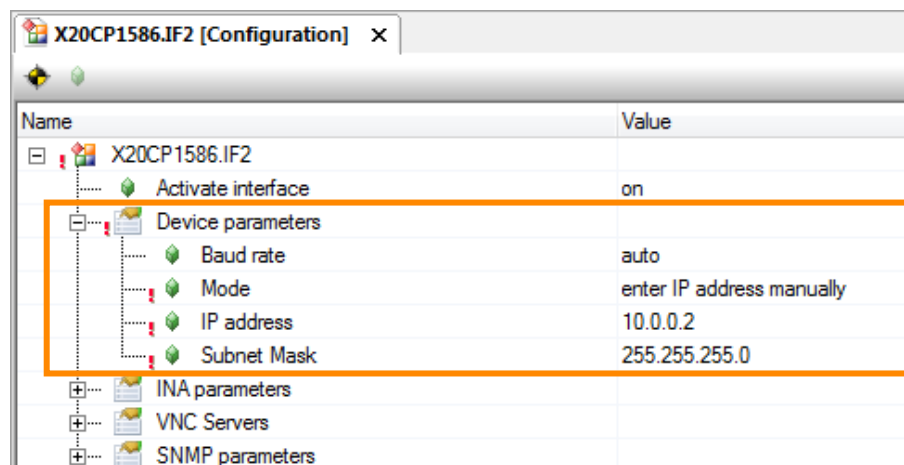
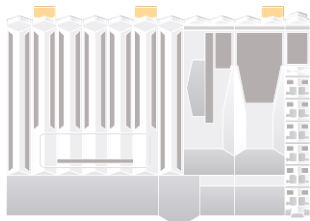


Настройки в Windows Control Panel



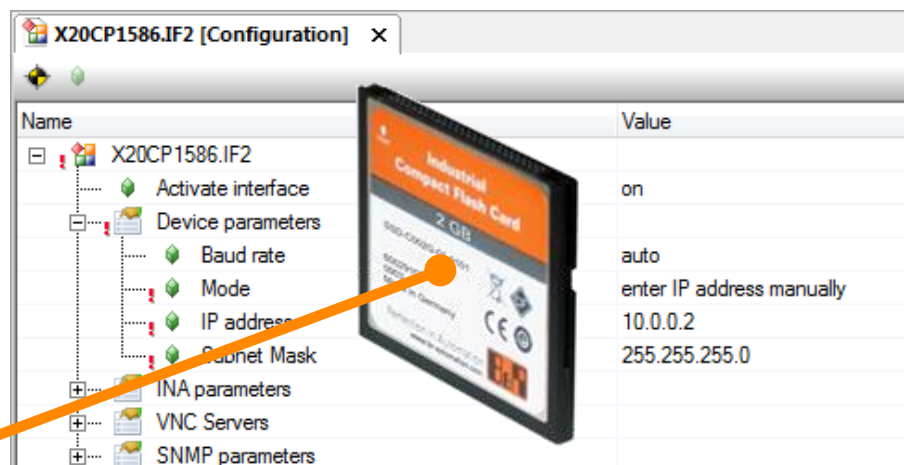


Изменение настроек сетевого интерфейса в Automation Studio



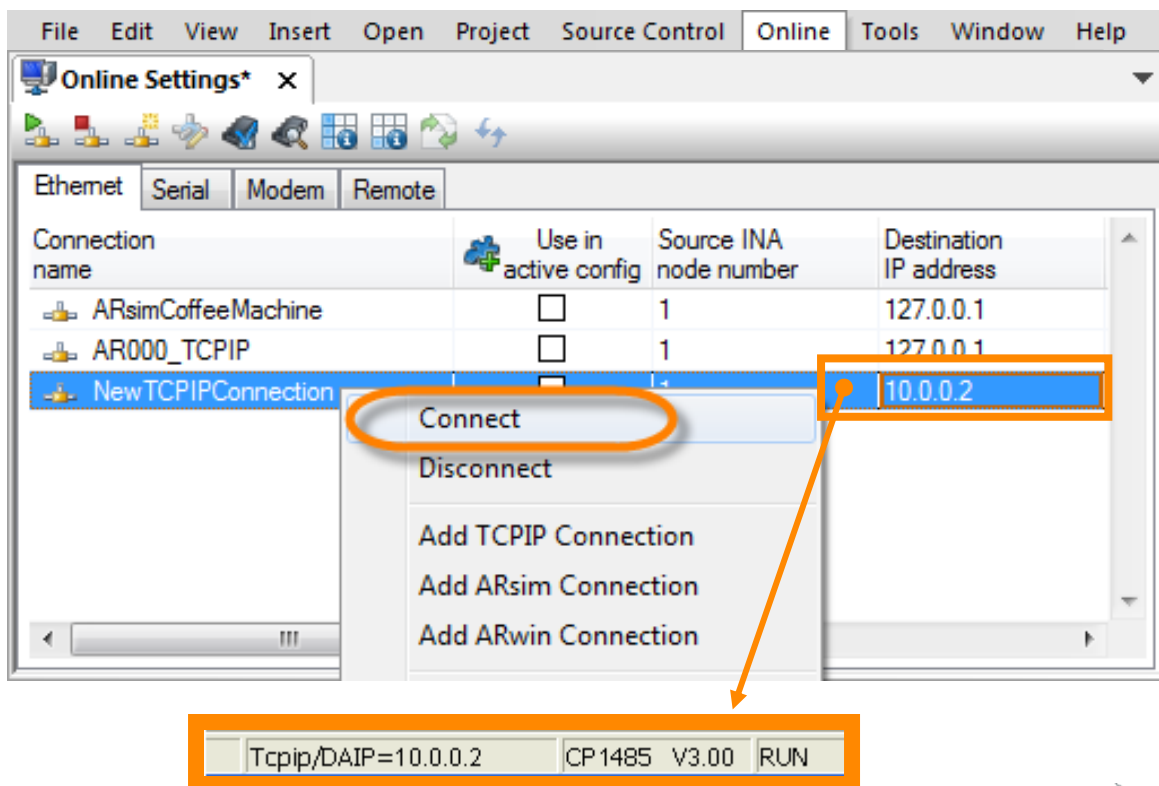


Создание данных на CompactFlash





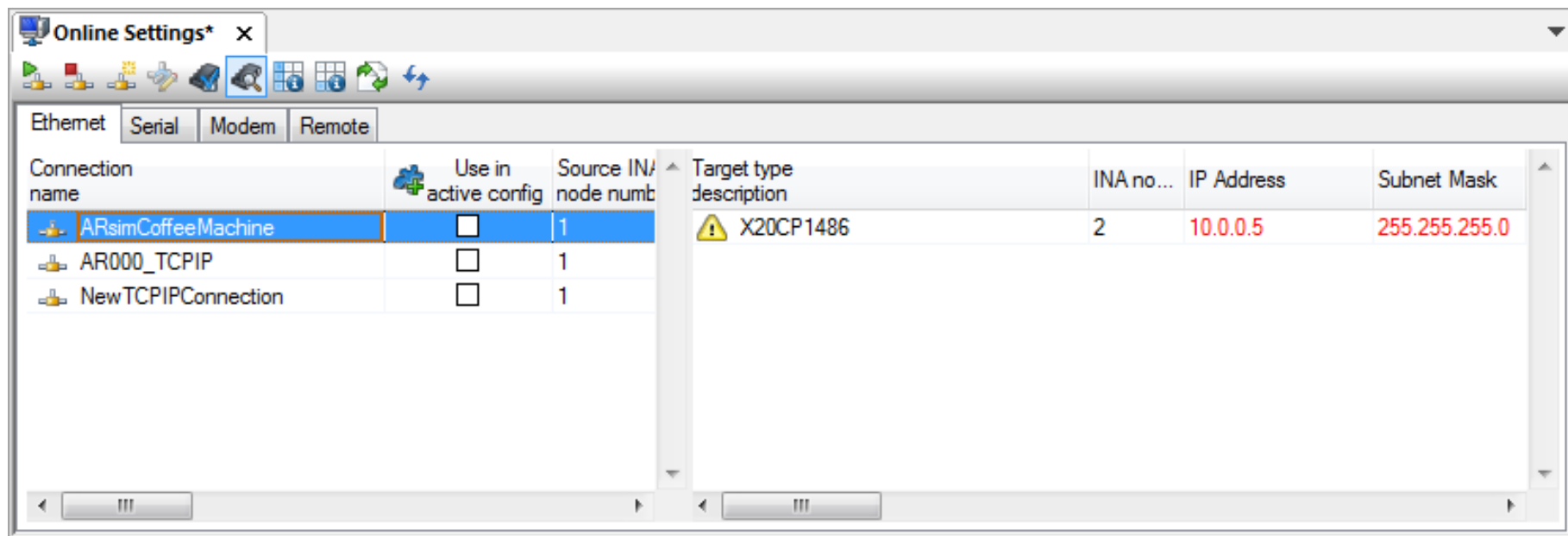
Установка соединения вручную в Automation Studio



Функция "Browse targets"



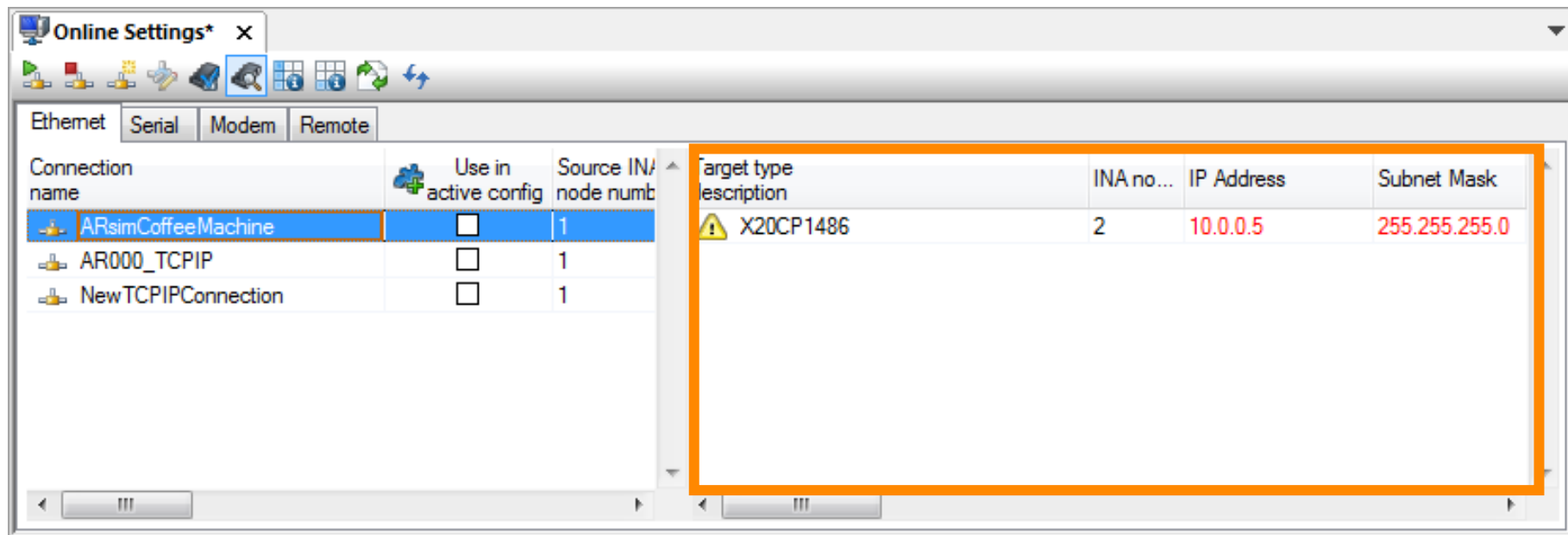
Отображает все активные контроллеры в сети



Функция "Browse targets"



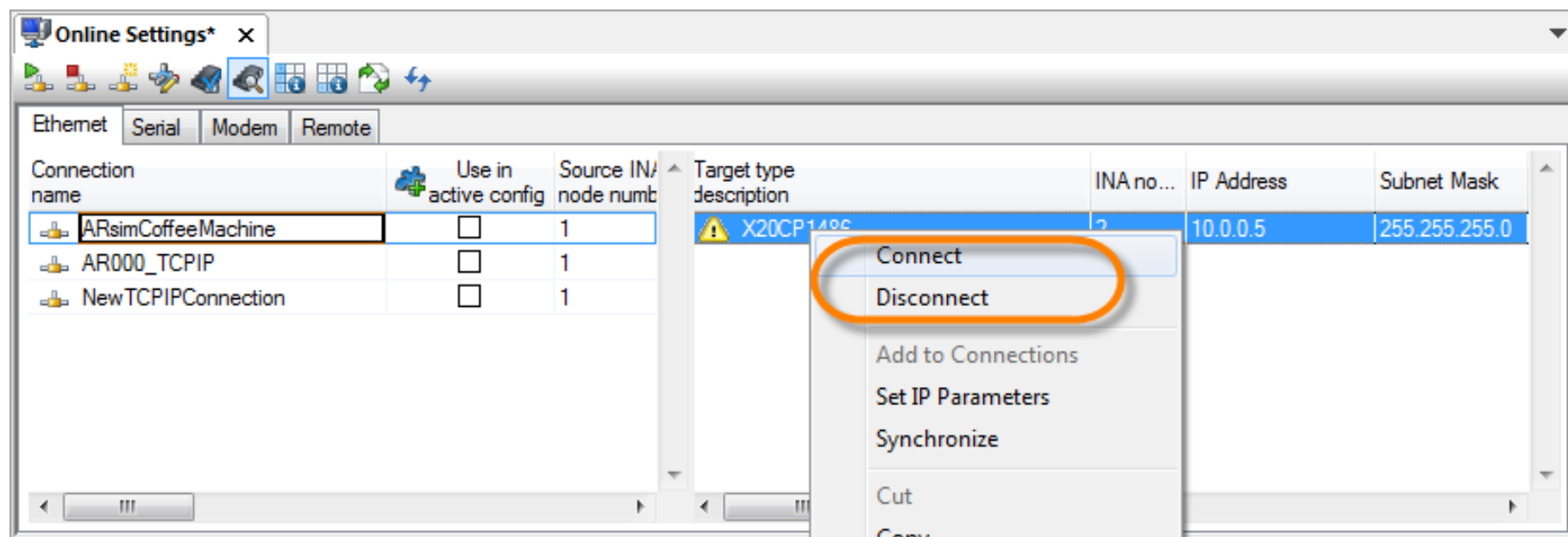
Отображает все активные контроллеры в сети



Функция "Browse targets"



Установка онлайн соединения





Считывание информации о системе



Статусная строка

1. Настройки подключения
2. Тип ПЛК и версия операционной системы
3. Текущее состояние ПЛК

tcpip/RT=1000 /DAIP=172.16.1.104 /REPO=11159 /ANSL=1	X20CP1486 V3.08	RUN
--	-----------------	-----

1

2

3

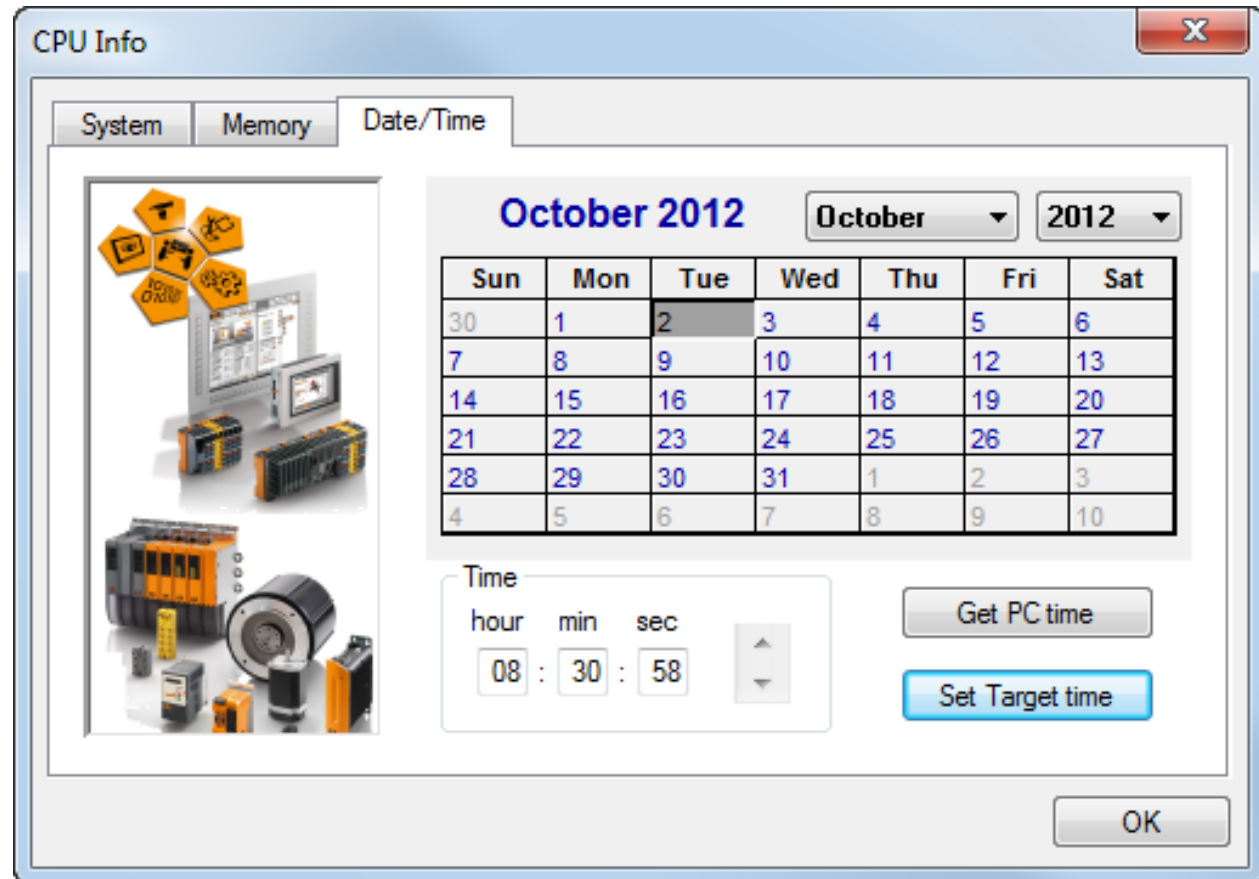


Получение информации о системе



При установленном онлайн подключении

- Состояние батареи
- Состояние памяти
- Настройки
системного времени





Онлайн сравнение

ARsim [Software Difference] X

X20CP1486 [Hardware Difference] X

Name	Order Number	Position	PLC Address
X20CP1486 [Project]	X20CP1486		\$root
Serial		IF1	IF1
ETH		IF2	IF2
EPL		IF3	IF3
USB		IF4	IF4
USB		IF5	IF5
X2X		IF6	IF6
X20DI9371	X20DI9371	ST1	IF6.ST1
X20DO9322	X20DO9322	ST2	IF6.ST2
		SS1	

Name	Order Number	Position	PLC Address
X20CP1486 [Target]	X20CP1486		\$root
Serial		IF1	IF1
ETH		IF2	IF2
EPL		IF3	IF3
USB		IF4	IF4
USB		IF5	IF5
X2X		IF6	IF6
X20AI2622	X20AI2622	ST1	IF6.ST1
X20AO2622	X20AO2622	ST2	IF6.ST2
X20AT2222	X20AT2222	ST3	IF6.ST3
X20DI9371	X20DI9371	ST4	IF6.ST4
X20DO9322	X20DO9322	ST5	IF6.ST5
X20DC1396	X20DC1396	ST6	IF6.ST6
		SS1	



Получение информации о системе



Logger

PLC1.CPU [Software Configuration] SL1 [Logger] x

Modules

Object Name	Visible	Continuous
Online	☒	☐
System	☒	☐
User	☐	☐
Fieldbus	☐	☐
Safety	☐	☐

Logger Entries: 8

Level	Time	Error Number	OS Task	Error Description	ASCII Data
1 Warning	2011-06-27 13:00:08.519000	9222	ROOT	Warning: Warm restart after powerfail	Boot
2 Warning	2011-06-27 13:00:05.885000	9200	ROOT	Warning: System halted because of power loss	Boot:Powerup
3 Warning	2011-06-27 12:58:46.208000	7424	syserv	Warning: PLC reset: Reset/Halt via communication	
4 Error / Syst...	2011-06-27 12:44:34.961000	9124	IOScheduler	TC#1 maximum cycle time violation	
5 Warning	2011-06-27 06:48:14.579000	27060	ROOT	NV memory (HDD/CF/RAM) has been exchanged	HDD/CF/RAM was changed
6 Warning	2011-06-27 06:47:53.665000	30028	ROOT	Carried out reboot	reboot required - modified hardware description (h...
7 Warning	2011-06-27 06:47:47.443000	9200	ROOT	Warning: System halted because of power loss	Boot:Powerup
8 Information	2011-06-27 06:47:48.140000	31280	ROOT	AR logger module created	base log module created

Details

Name	Value
Level	Error / System Exception
Date	27.06.2011
Time	12:44:34,961000
Error Number	9124
OS Task	IOScheduler
Logger Module	System
Location	Online
Error Description	TC#1 maximum cycle time violation
ASCII Data	
Exception Data	
AR Version	M3.08
Processor Data	
Program Counter	0x03e004a4
EFLAGS	0x00000206
Error code of exception frame	0x00000000





Менеджер системной диагностики (SDM)

B&R System Diagnostics Manager

B&R System Diagnostics Manager

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SDM

System

General

Memory

Timing

CPU Usage

Software

Hardware

Logger

Profiler

System - General

Operational Values

Node number: 204 / 0xCC
Current CPU mode: RUN
Battery status: OK

CPU temperature: 47 °C / 116.6 °F
Current CPU usage: 22%

History

Target time: 2011-06-27 / 15:17:32

Operating hours: -
Power-on cycles: -

Time Synchronisation

Time zone: GMT
SNTP server: disabled
SNTP client: disabled
SNTP server 1: -
SNTP server 2: -
SNTP server 3: -
SNTP server 4: -
SNTP sync interval: -
RTC sync interval: -

Software Versions

Automation runtime: M03.08
Visual components: -
Motion control: -
CNC software: -

CPU Configuration

Host name: brunnerhX20-p..
Default domain: -

CPU mode switch: 0x04
Reboot mode
after reset: service
after powerfail: warm start
after change of CF/HD: warm start
Preserve permanent PV memory
after change of CF/HD: no

Profiling: enabled
FTP: enabled
USB remote install: disabled
CF remote install: disabled

Ethernet Network Devices

Default gateway: 172.16.0.1
IF2 172.16.1.111
IF3.ETH 192.168.101.240

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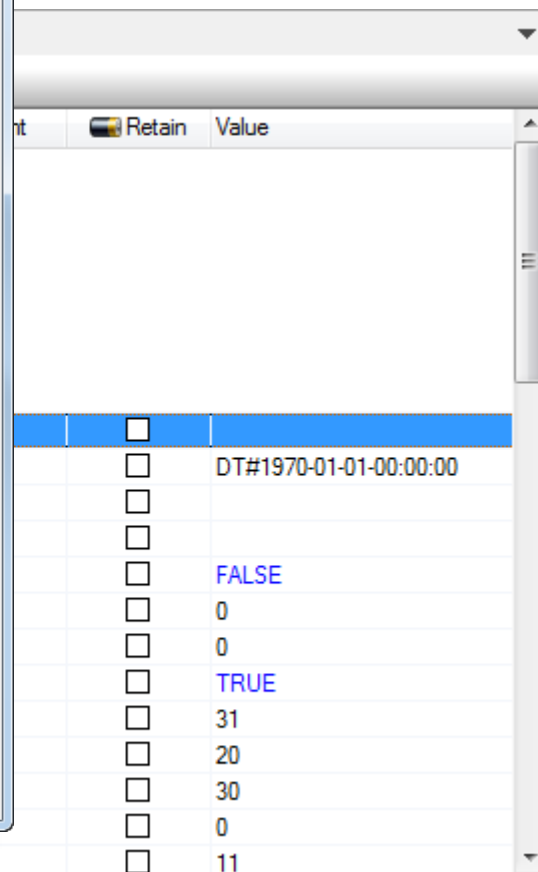
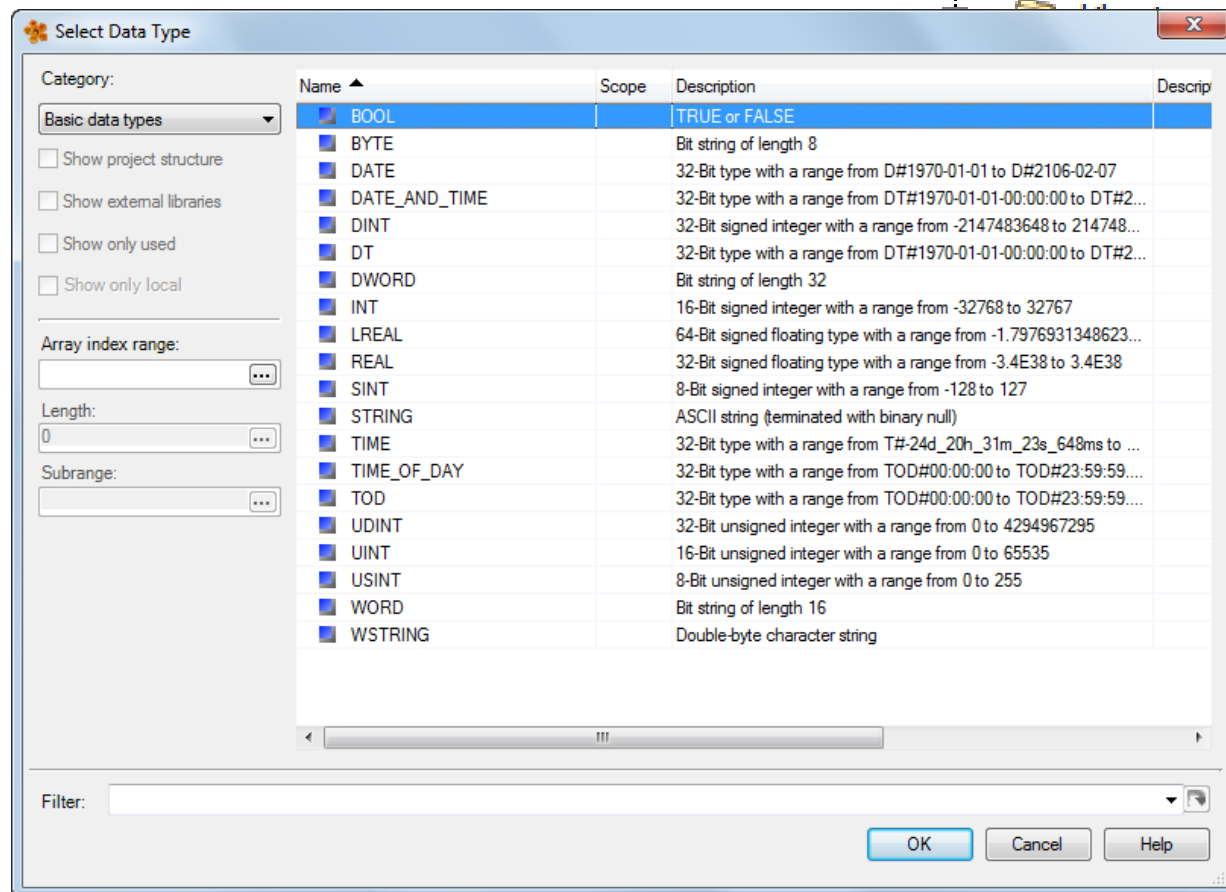
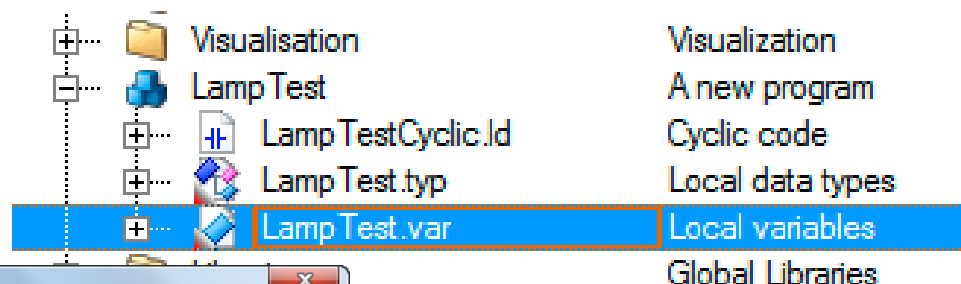
X20CP1485-1 | brunnerhX20-profiling | RUN | 2011-06-27 / 15:17:32 GMT



Настройка и поведение системы при исполнении



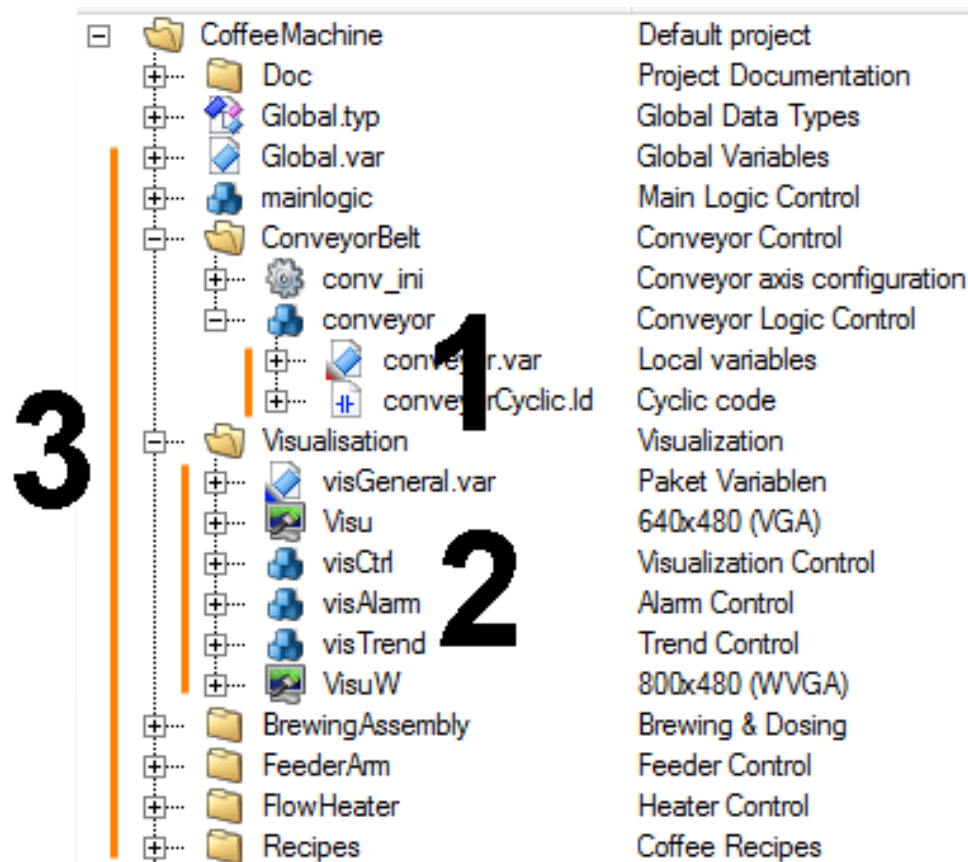
Переменные и типы данных





Область видимости переменных

1. Локальные переменные
2. Глобальные переменные в рамках папки
3. Глобальные переменные





Software configuration

The screenshot displays the BR Automation software configuration interface. The left window, titled "Logical View", shows a tree structure of objects. The right window, titled "PP420 [Software]", shows a table of objects and their properties.

Logical View Object List:

Object Name	Description
Global.type	Global Data Types
Global.var	Global Variables
mainlogic	Main Logic Control
ConveyorBelt	Conveyor Control
conv_ini	Conveyor axis configuration
conveyor	Conveyor Logic Control
conveyorCyclic.Id	Cyclic code
conveyor.var	Local variables
BrewingAssembly	Brewing & Dosing
FeederArm	Feeder Control
FlowHeater	Heater Control
Recipes	Coffee Recipes
regular	Normal coffee
cappu	Cappuccino
espres	Espresso
Visualisation	Visualization
Libraries	Global Libraries

PP420 [Software] Object List:

Object Name	Version	Transfer To	Size (bytes)	Source	Source File	Description
CPU						
Cyclic #1 - [10 ms]						
mainlogic	1.00.0	UserROM	0	mainlogic	PP400based\PP420\C...	Main Log...
feeder	1.00.0	UserROM	0	FeederArm.feeder	PP400based\PP420\C...	feeder lo...
conveyor	1.00.0	UserROM	0	ConveyorBelt.conveyor	PP400based\PP420\C...	Conveyo...
heating	1.00.0	UserROM	0	FlowHeater.heating	PP400based\PP420\C...	Heating I...
brewing	1.00.0	UserROM	0	BrewingAssembly.brewing	PP400based\PP420\C...	Brewing
Cyclic #2 - [20 ms]						
Cyclic #3 - [50 ms]						
Cyclic #4 - [100 ms]						
visCtrl	1.00.0	UserROM	0	Visualisation.visCtrl	PP400based\PP420\C...	Visualizat...
visAlarm	1.00.0	UserROM	0	Visualisation.visAlarm	PP400based\PP420\C...	Alarm Co...
visTrend	1.00.0	UserROM	0	Visualisation.visTrend	PP400based\PP420\C...	Trend Co...
Cyclic #5 - [200 ms]						
Cyclic #6 - [500 ms]						
Cyclic #7 - [1000 ms]						
Cyclic #8 - [10 ms]						
Data Objects						
espres	1.00.0	UserROM	0	Recipes.espres	PP400based\PP420\C...	Espresso
cappu	1.00.0	UserROM	0	Recipes.cappu	PP400based\PP420\C...	Cappucin...
regular	1.00.0	UserROM	0	Recipes.regular	PP400based\PP420\C...	Normal c...
No Data Objects						
motor_sim	1.00.0	UserROM	0	FeederArm.motor_sim	PP400based\PP420\C...	Paramete...
motor_offi	1.00.0	UserROM	0	FeederArm.motor_office	PP400based\PP420\C...	ACOPOS
conv_ini	1.00.0	UserROM	0	ConveyorBelt.conv_ini	PP400based\PP420\C...	Conveyo...
feed_ini	1.00.0	UserROM	0	FeederArm.feed_ini	PP400based\PP420\C...	Feeder a...
acp_err	1.00.0	UserROM	0	FeederArm.acp_err	PP400based\PP420\C...	ACP10: E...
Visualization						
Binary Objects						
Library Objects						
sys_lib		UserROM	0	Libraries.sys_lib	PP400based\PP420\C...	
brsystem		UserROM	0	Libraries.brsystem	PP400based\PP420\C...	

Two orange arrows highlight the configuration flow: one from the "conveyor" object in the Logical View to the "conveyor" object in the PP420 [Software] table, and another from the "regular" object in the Logical View to the "regular" object in the PP420 [Software] table.



Настройки аппаратных модулей

Physical View

Name L... Position

- X20CP1486
 - Serial IF1
 - ETH IF2
 - EPL IF3
 - USB IF4
 - USB IF5
 - X2X IF6
- X20DI9371 CT1
- X20D...

X20DI9371 [Configuration]

Name	Value	Description
X20DI9371		
Function model	default	Module operating mode
General		
Module supervised	on	Service mode if there is no hardware module
Module information	off	Additional module information
Input filter [0.1 ms]	10	Specifies the filter time of all digital inputs
Packed inputs	off	Packed I/O data instead of single digital inputs
Simulation device		Assigned simulation device
Offset for inputs	0	Offset is relative to base address of bus controller
Offset for outputs	0	Offset is relative to base address of bus controller

I/O Mapping

Configuration

System Designer

Add Hardware Module...

Replace Hardware Module...

Cut

Copy

Paste



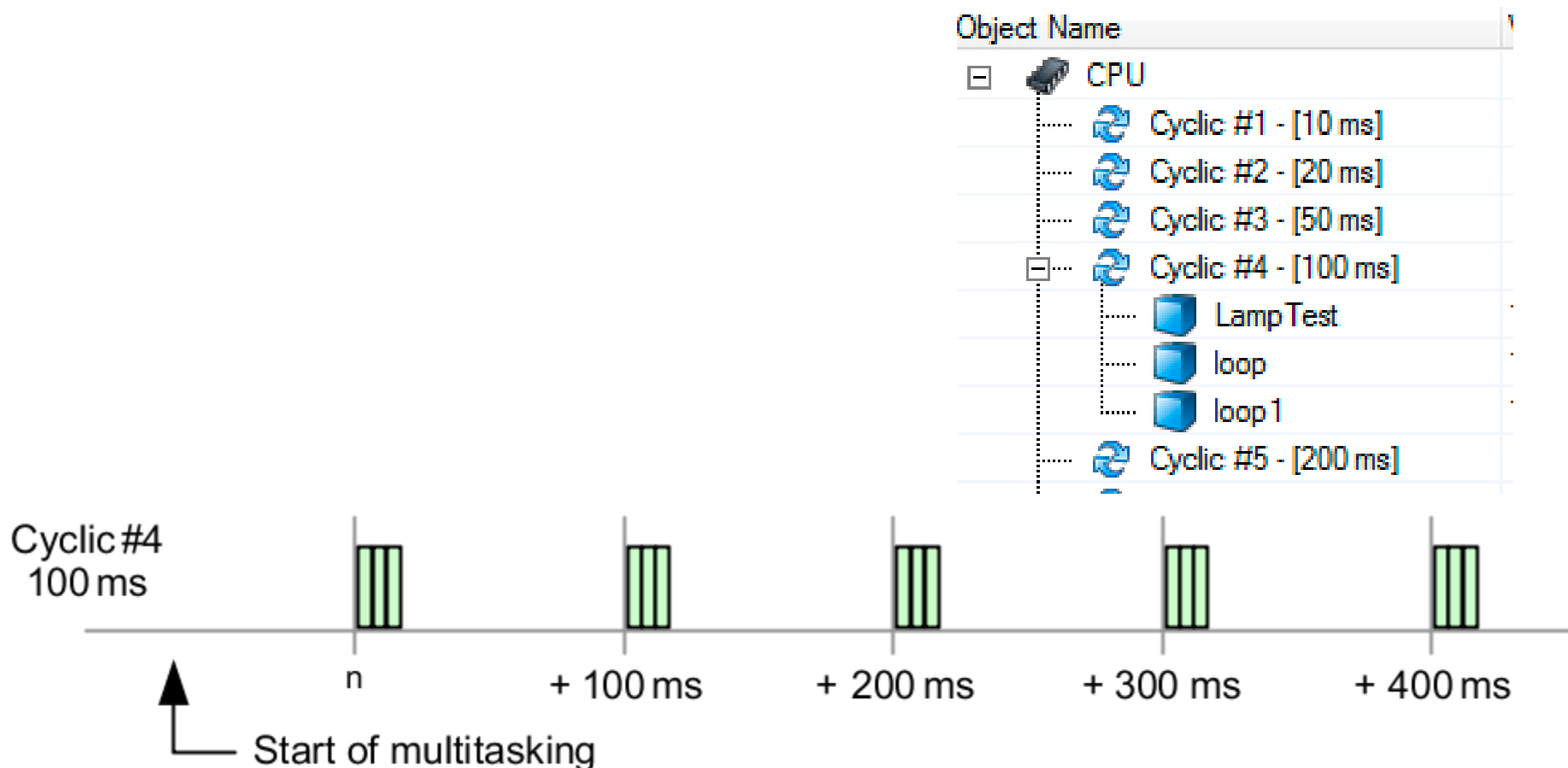
Назначение переменных каналам ввода\вывода

The screenshot displays the 'Physical View' of a SIMATIC Manager project. The main window shows a hardware configuration tree with components like X20CP1486, X20CP1486, X20DI9371, and X20DO9322. The 'X20DI9371' module is selected, and its properties are shown in the 'X20DI9371 [I/O Mapping]*' window. This window contains a table with columns: Channel Name, Process Variable, Data Type, Task Class, Inverse, and Simulate. The table lists various channels and their associated variables and data types. A 'Select' dialog box is open in the foreground, showing the 'Variables' tab. It includes a 'Data Type' filter set to 'BOOL' and a list of variables under 'Global variables' and 'Lamp Test'. The 'Only Not Connected' checkbox is checked, and the 'Filter' field is empty. The 'OK' button is highlighted.

Channel Name	Process Variable	Data Type	Task Class	Inverse	Simulate
ModuleOk		BOOL		☐	☐
SerialNumber		UDINT		☐	☐
ModuleID		UINT		☐	☐
HardwareVariant		UINT		☐	☐
FirmwareVersion		UINT		☐	☐
DigitalInput01	LampTest:Switch	BOOL	Automatic	☐	☐
DigitalInput02		BOOL		☐	☐



Циклическое выполнение программ





Анализ состояния переменных процесса

Состояния переменных процесса



Сравнение ПО при установленном онлайн подключении

Программы на целевой системе

Доступ через контекстное меню

X20CP1586 [Software Difference] ×

Object Name Version Transfer To Object Name Version Memory Size (...) State Date

CPU [Project]

- Cyclic #1 - [10 ms]
- Cyclic #2 - [20 ms]

CPU [Target]

- Cyclic #1 - [10 ms]
- mainlogic 1.00.0 UserROM 4800 Running 01.07.2014 09:52:14
- feeder 1.00.0 UserROM 18464 Running 01.07.2014 09:52:15
- conveyor 1.00.0 UserROM 18904 Running 01.07.2014 09:52:16
- brewing 1.00.0 UserROM 4484 Running 01.07.2014 09:52:17
- heating 1.00.0 UserROM 8000 Running 01.07.2014 10:14:40

Watch
Trace
Profiler
Open
Cut
Copy



Состояния переменных процесса



Создание списка cross-reference

Определяется, как переменные используются в проекте

Cross Reference

Cross Reference valid: ? Filter:

Name	Type	Scope	Description
pBrewingText	UDINT	brewing	
ProductCounter	UDINT	LampTest	
sBREWING	UINT	brewing	
sDOSING	UINT	brewing	
sFINISH	UINT	brewing	
simLCRPT2	LCRPT2	heating	
sSTANDBY	UINT	brewing	
sugarTP	TP	brewing	
Switch	BOOL	LampLad	
tempLCRPID	LCRPID	heating	
tempLCRPIDp...	LCRPIDp...	heating	
udEndValue	UDINT	loop	
udStartValue	UDINT	loop	
value	UDINT	loop	
waterTP	TP	brewing	

udStartValue

loop

st /Logical/loop/loopCyclic.st

Ln:16, Col:14

READ

loop1

st /Logical/loop/loopCyclic.st

Ln:16, Col:14

READ

Generate cross reference data during build

OK Cancel Help



Отслеживание и изменение значений переменных

Object Name | Version | Transfer To | Size (bytes) | Source

SL1 [Logger] | CP1 [Software Configuration] | mainlogic::pvm [Watch] x | st Logger::Logger.st [Struct]

Name | Type | Scope | Force | Value

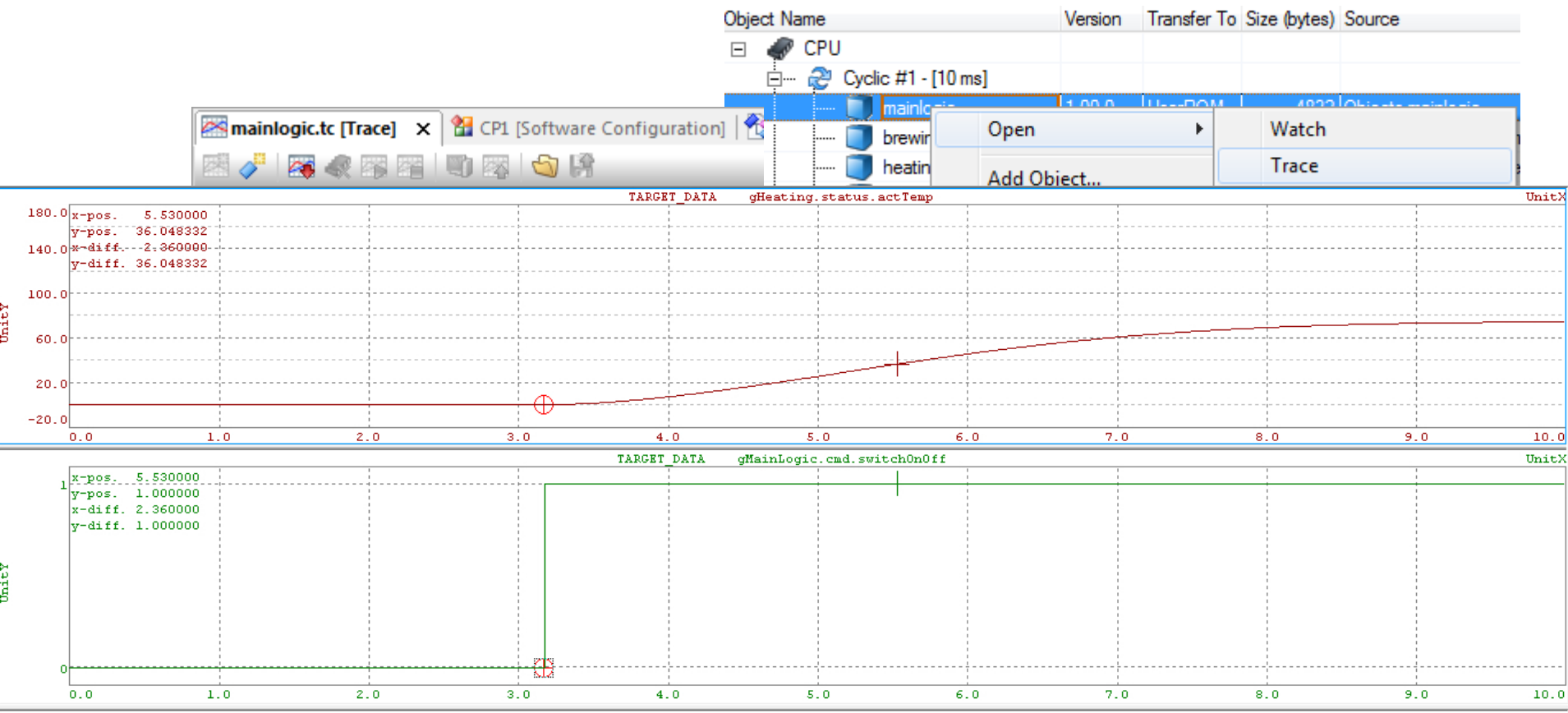
gMainLogic	main_typ	global		
cmd	main_cmd_typ			
switchOnOff	BOOL			FALSE
errorAck	BOOL			FALSE
start	BOOL			FALSE
vis	main_cmd_vis_t			
par	main_par_typ			
coffeeType	SINT			0
givenMoney	REAL			0.0
receipe	main_par_receip			
price	REAL			1.69
setTemp	REAL			80.0
milk	REAL			100.0
sugar	REAL			30.0
coffee	REAL			60.0
water	REAL			150.0
status	main_status_typ			
money	main_status_moi			
progressStep	USINT			0
curPage	UINT			0
curLanguage	UINT			0
startProgressStep	USINT			0
gHeating	heating_typ	global		
cmd	heating_cmd_ty			
start	BOOL			FALSE
updatePIDpar	BOOL			FALSE
status	heating_status_t			
setTempOK	BOOL			FALSE

Watch
Trace

Состояния переменных процесса



Запись значений в реальном времени





Мониторинг входов\выходов и форсирование

PLC1.CPU.IF6.ST1 [I/O Mapping] x

Channel Name	Data Type	Physical Value	Force	Force Value	PV or Channel Value	PV or Channel Name	Inv.
ModuleOk	BOOL	TRUE	☐	FALSE			☐
DigitalInput01	BOOL	FALSE	☒	TRUE	TRUE	LampTest.Switch	☐
DigitalInput02	BOOL	FALSE	☐	FALSE			☐
DigitalInput03	BOOL	FALSE	☐	FALSE			☐
DigitalInput04	BOOL	FALSE	☐	FALSE			☐
DigitalInput05	BOOL	FALSE	☐	FALSE			☐
DigitalInput06	BOOL	FALSE	☐	FALSE			☐
DigitalInput07	BOOL	FALSE	☐	FALSE			☐
DigitalInput08	BOOL	FALSE	☐	FALSE			☐
DigitalInput09	BOOL	FALSE	☐	FALSE			☐
DigitalInput10	BOOL	FALSE	☐	FALSE			☐
DigitalInput11	BOOL	FALSE	☐	FALSE			☐
DigitalInput12	BOOL	FALSE	☐	FALSE			☐

LampTest::pvm [Watch] x

Name	Type	Scope	Force	Value
Lamp	BOOL	local		TRUE
Switch	BOOL	local		TRUE





Встроенные методы диагностики приводов



Менеджер системной диагностики (SDM)

B&R System Diagnostics Manager

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- SDM
- System
- Software
- Hardware
- Motion
 - Axis Information**
 - NW Command Trace
 - Trace Data
 - Trace Operate
- Logger
- Profiler

Motion - Axis Information

Name:	gAxis01	gAxis02	gAxis03	gAxis04	gAxis05
Drive:	ACOPOS SDC	ACOPOS SDC	ACOPOS SDC	ACOPOS SDC	ACOPOS SDC
Address:	SDC_IF1.ST1..	SDC_IF1.ST2..	SDC_IF1.ST3..	SDC_IF1.ST4..	SDC_IF1.ST5..
Homing					
Controller					
Simulation					
Movement status					
Act. position [Units]	8385000	8385000	8385000	8385000	8388607
Act. speed [Units/s]	0	0	0	0	0
Enable					
Trigger 1					
Trigger 2					
Positive endswitch					
Negative endswitch					
Reference switch					
Alarm					

Axis selection: On - Off Axis 1 to 5 of 6

Встроенные методы диагностики приводов

PERFECTION IN AUTOMATION
www.br-automation.com



Окно NC Test

The screenshot displays the NC Test window for a gAxis03.mdc [Test] project. The interface is divided into several panels:

- Physical View:** Shows a tree structure of the test setup. The 'Additive' method is selected under 'Basis Movement'.
- Structure:** A table listing parameters and their values.
- Watch:** A table showing the current state of various parameters.
- Trace:** Two graphs showing the test results over time.

Structure Table:

Name	Value	Unit	Description
edge_sw	ncPOSITIVE		Edge of reference
start_dir	ncPOSITIVE		Start direction
trigg_dir	ncPOSITIVE		Trigger direction
ref_pulse	ncOFF		Reference pulse
tr_s_block	0	Rev.	Distance for block
basis			
init	ncTRUE		Basis movements
status			Status
override			Override
parameter			Parameters
s	1000	Units	Target position or
v_pos	10000	Units/s	Speed in positive
v_neg	10000	Units/s	Speed in negative
a1_pos	50000	Units/s²	Acceleration in po
a2_pos	50000	Units/s²	Deceleration in po
a1_neg	50000	Units/s²	Acceleration in ne
a2_neg	50000	Units/s²	Deceleration in ne

Watch Table:

Parameter	Value	Unit	Description
network.init	ncTRUE		Network initialized
network.service.data_text			Data in text format
network.service.request.par_id	887; ENCOD_...		Parameter ID
network.service.response.par_id	887		Parameter ID
monitor.s	6000	Units	Position
monitor.v	0	Units/s	Velocity
message.count.error	0		Count of not acknowledged error
message.count.warning	0		Count of not acknowledged warning
message.record.par_id	0		Parameter ID
message.record.number	0		Error number
message.record.info	0		Additional Info

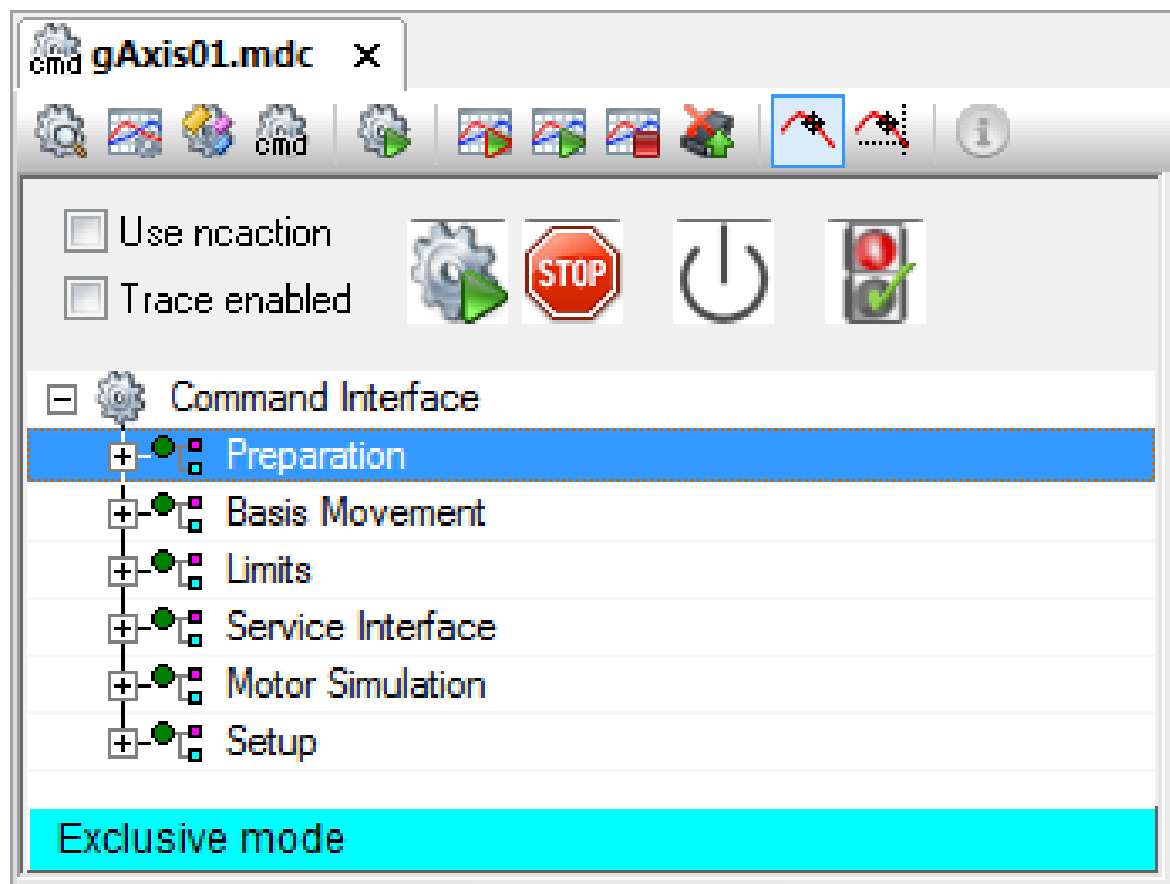
Trace Graphs:

- Top Graph:** Shows the speed profile (Units/s) over time (0.00 to 1.00). The speed starts at 0, rises to a peak of approximately 10000 Units/s, and then falls back to 0.
- Bottom Graph:** Shows the actual position (Units) over time (0.00 to 1.00). The position starts at 0, rises to a plateau of approximately 6000 Units, and then remains constant.

Two dialog boxes are visible on the right side of the screen, both with 'Cancel' buttons. The top dialog box has a red exclamation mark icon and the text 'is movements. / regulations in al.'. The bottom dialog box has a red exclamation mark icon and the text 'is movements. / regulations in al.'.



Интерфейс команд на исполнение





Управление параметрами

Structure				
Name		Value	Unit	Description
[-] [icon] ACP10AXIS_typ				
[+] [icon] size		884	Bytes	Size of the corresponding NC manager data type
[+] [icon] sw_version				SW Version ID [hexadecimal]
[+] [icon] nc_obj_inf				NC Object Information
[+] [icon] simulation				Simulation Mode
[+] [icon] global				Global Parameters
[+] [icon] network				Network
[+] [icon] dig_in				Digital Inputs
[+] [icon] encoder_if				Encoder Interface
[+] [icon] limit				Limit value
[+] [icon] controller				Controller
[+] [icon] move				Movement
[+] [icon] setup				Setup
[+] [icon] monitor				Monitor
[+] [icon] message				Messages (errors, warnings)
[+] [icon] nc_test				NC Test





Управление параметрами

Structure				
Name		Value	Unit	Description
ACP10AXIS_typ				
+	size	884	Bytes	Size of the corresponding NC manager data type
+	sw_version			SW Version ID [hexadecimal]
+	nc_obj_inf			NC Object Information
+	simulation			Simulation Mode
+	global			Global Parameters
+	network			Network
+	dig_in			Digital Inputs
+	encoder_if			Encoder Interface
+	limit			Limit value
+	controller			Controller
+	move			Movement
+	setup			Setup
+	monitor			Monitor
+	message			Messages (errors, warnings)
+	nc_test			NC Test





Отображение информации об оси

Watch

1

PLCopen State: Standstill

Parameter	Value	Unit	Description
network.init	ncTRUE		Network initialized
network.service.data_text			Data in text format
network.service.request.par_id	887; ENCOD_...		Parameter ID
network.service.response.par_id	887		Parameter ID
monitor.s	0	Units	Position
monitor.v	0	Units/s	Velocity
message.count.error	0		Count of not acknowledged errors
message.count...			
message.record...			
message.record...			
message.record...			

2

Watch

3

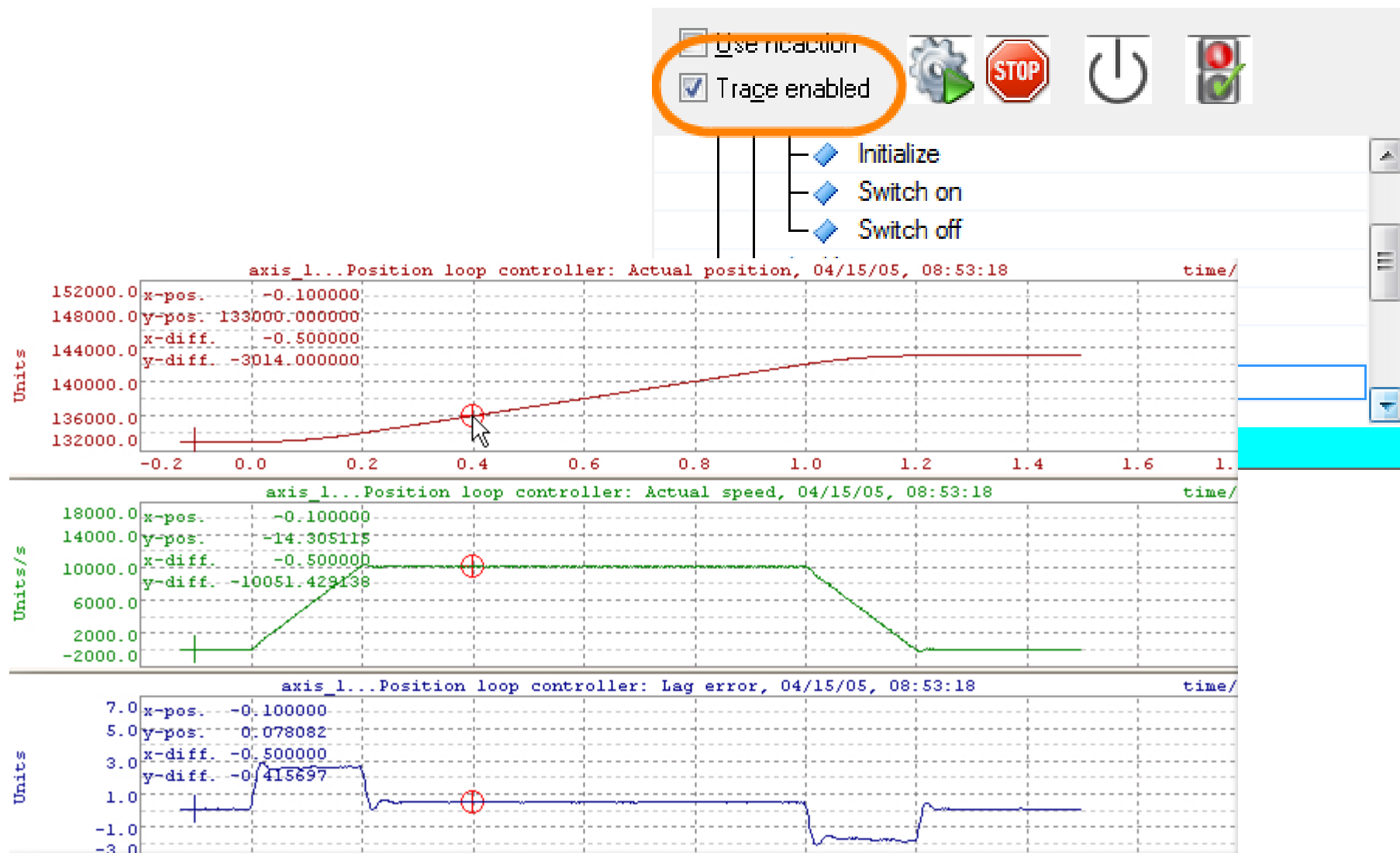
PLCopen State: Disabled

ParId 115: Basis movements: Start movement with absolute target position
Error 5005: Start of movement not possible: Position controller inactive



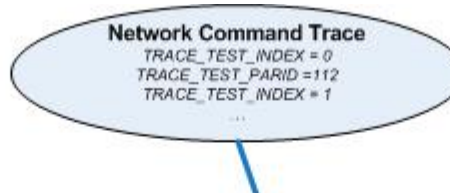


Функции для записи и графического отображения





Network command trace



Trace								
Index	Interface	Node	NC Object	Request	Time [s]	Time [s]	Response	Ind
114	PLK[0]	1	ncAXIS 1	NC_ACTION_PLCOpen_MC	4000.087			
115	PLK[0]	1	ncAXIS 1	→ CYCLIC_TODRV_PAR_INDEX = 0	4000.087			
	PLK[0]	1				4000.097	→	1
117	PLK[0]	1	ncAXIS 1	→ CYCLIC_TODRV_PARID = 234	4000.097			
	PLK[0]	1				4000.107	→	1
119	PLK[0]	1	ncAXIS 1	NC_ACTION_PLCOpen_MC	4000.127			
120	PLK[0]	1	ncAXIS 1	NC_ACTION_PLCOpen_MC	4000.147			
121	PLK[0]	1	ncAXIS 1	→ AXLIM_V_POS = 10000 Units/s	4000.147			
	PLK[0]	1				4000.157	→	1
123	PLK[0]	1	ncAXIS 1	→ AXLIM_V_NEG = 10000 Units/s	4000.157			
	PLK[0]	1				4000.167	→	1
125	PLK[0]	1	ncAXIS 1	→ AXLIM_A1_POS = 50000 Units/s ²	4000.167			
	PLK[0]	1				4000.177	→	1
127	PLK[0]	1	ncAXIS 1	→ AXLIM_A2_POS = 50000 Units/s ²	4000.177			
	PLK[0]	1				4000.187	→	1
129	PLK[0]	1	ncAXIS 1	→ AXLIM_A1_NEG = 50000 Units/s ²	4000.187			
	PLK[0]	1				4000.197	→	1
131	PLK[0]	1	ncAXIS 1	→ AXLIM_A2_NEG = 50000 Units/s ²	4000.197			
	PLK[0]	1				4000.207	→	1
133	PLK[0]	1	ncAXIS 1	→ AXLIM_T_JOLT = 0 s	4000.207			
	PLK[0]	1				4000.217	→	1
135	PLK[0]	1	ncAXIS 1	→ AXLIM_T_INPOS = 0 s	4000.217			
	PLK[0]	1				4000.227	→	1





Диагностика интегрированной системы безопасности



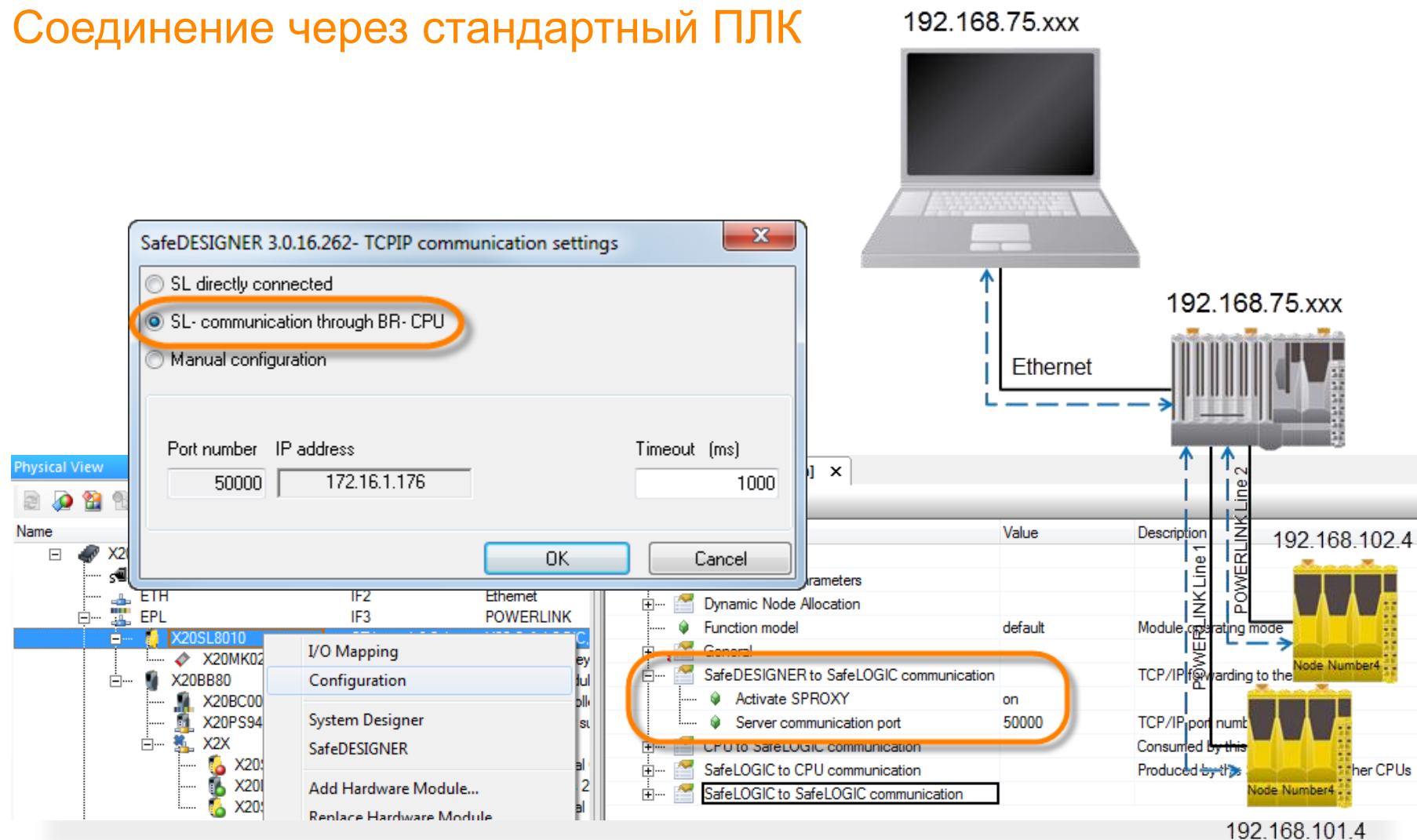
Открытие SafeDESIGNER

The screenshot displays the SafeDESIGNER 3.0.16.262 - Standard - [Code:Main] interface. The main workspace shows a ladder logic diagram with two safety modules: SF_EmergencyStop_V1_00_1 and SF_ESPE_V1_00_1. The interface includes several numbered callouts (1-11) pointing to specific features:

- 1: Main menu bar (File, Edit, View, Project, Build, Objects, Layout, Online, Window, ?)
- 2: Toolbar with icons for Save, Zoom In, Zoom Out, Project Tree, Edit Wizard, Messages, XReferences, Toggle W/S, Global decl., Compile, Simulate, Variable st..., and SafePLC.
- 3: Left sidebar (Edit Wizard) showing a list of functions and variables (ADD, AND, AND_S, BIT_TEST, etc.).
- 4: Project Tree Window showing the hierarchy of the project (Libraries, PLCOpen_SF, Logical POU's, Main*).
- 5: Central toolbar with icons for Mark, Connect, Undo, Variable, Comment, Network, Contact right, Contact left, Parallel, Coil right, Left powerail, Right powerail, and Contact type.
- 6: Main workspace showing the ladder logic diagram with two safety modules and their connections.
- 7: Channel Name list on the left showing the selected channel (SL1.SM2).
- 8: Model no. and Description window showing the selected module (X20SO2110) and its parameters.
- 9: Variable declaration window showing the list of variables used in the program.
- 10: Variable declaration window showing the list of variables used in the program.
- 11: Watch Window showing the current values of the variables.

The bottom status bar indicates the current project state: 29.70 C: >2GB Project (Development).

Соединение через стандартный ПЛК





Установка соединения с контроллером SafeLOGIC



Set new SafePLC password

Enter old password:

Enter new password:

Confirm new password:

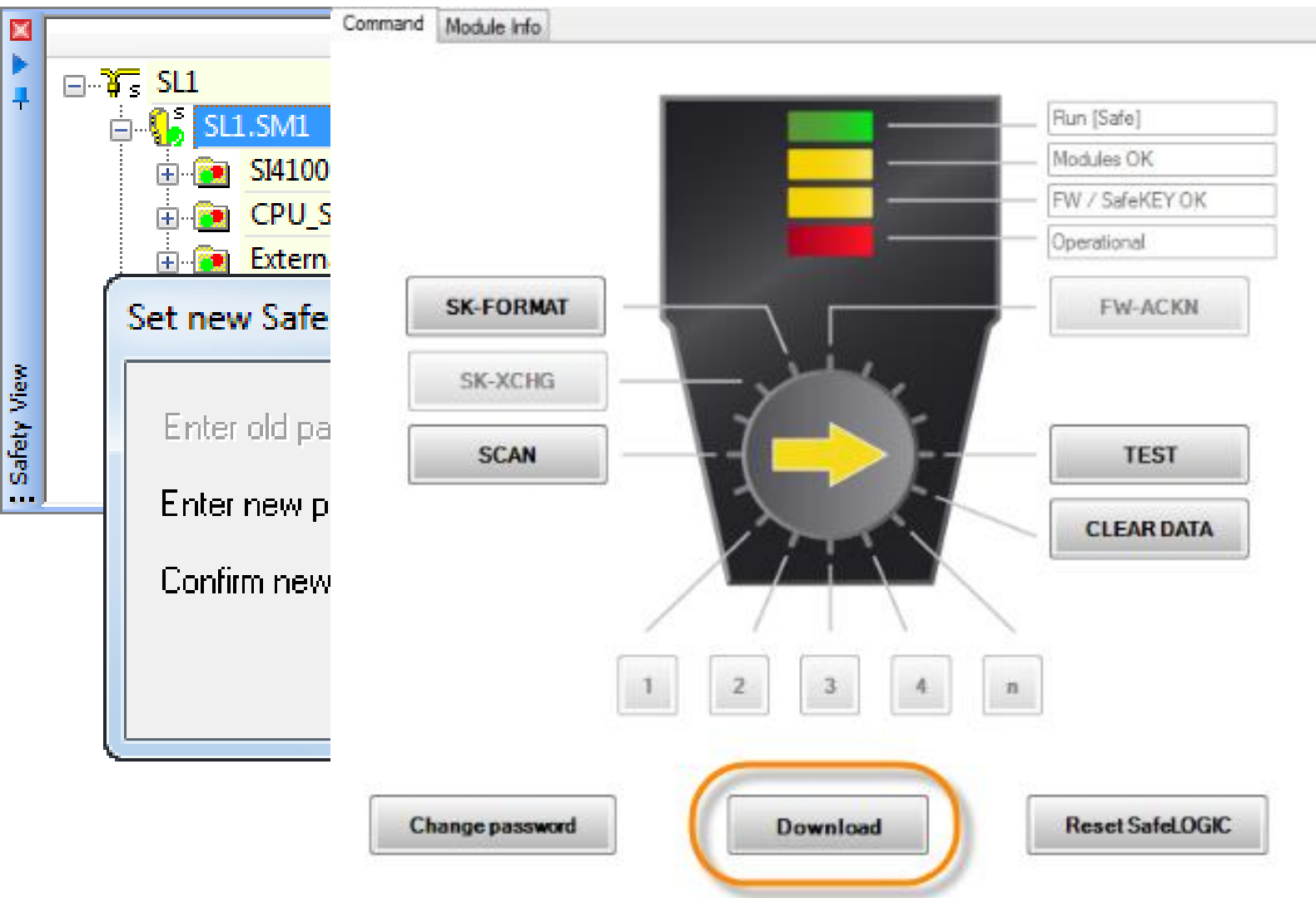
SafePLC

State: Stop [Debug]





Установка соединения с контроллером SafeLOGIC-X / SL8100





Отслеживание статусных битов с входов\выходов

Channel Name	Value	Slot
SL1		
SL1.SM1	IF3.ST1	
SL1.SM2	IF3.ST2.IF1.ST2	
SL1.SM3	IF3.ST2.IF1.ST4	
SafeModuleOk		
SafeDigitalInput01		
SafeDigitalInput02		
SafeDigitalInput03		
SafeDigitalInput04		
SafeEquivalentInput0102		
SafeAntivalentInput0102		
SafeEquivalentInput0304		
SafeAntivalentInput0304		
SafeChannelOK01		
SafeChannelOK02		
SafeChannelOK03		
SafeChannelOK04		
SafeEquivalentOK0102		
SafeAntivalentOK0102		
SafeEquivalentOK0304		
SafeAntivalentOK0304		

Channel Name	Value	Slot
SL1		
SL1.SM1	IF3.ST1	
SL1.SM2	IF3.ST2.IF1.ST2	
SafeModuleOk		
SafeDigitalOutput01		
SafeDigitalOutput02		
SafeChannelOK01		
SafeChannelOK02		
ReleaseOutput01		
ReleaseOutput02		
PhysicalStateChannel1		
PhysicalStateChannel2		
CurrentOK01		
CurrentOK02		
SL1.SM3	IF3.ST2.IF1.ST4	





Текущее состояние переменных в окне объявления глобальных переменных



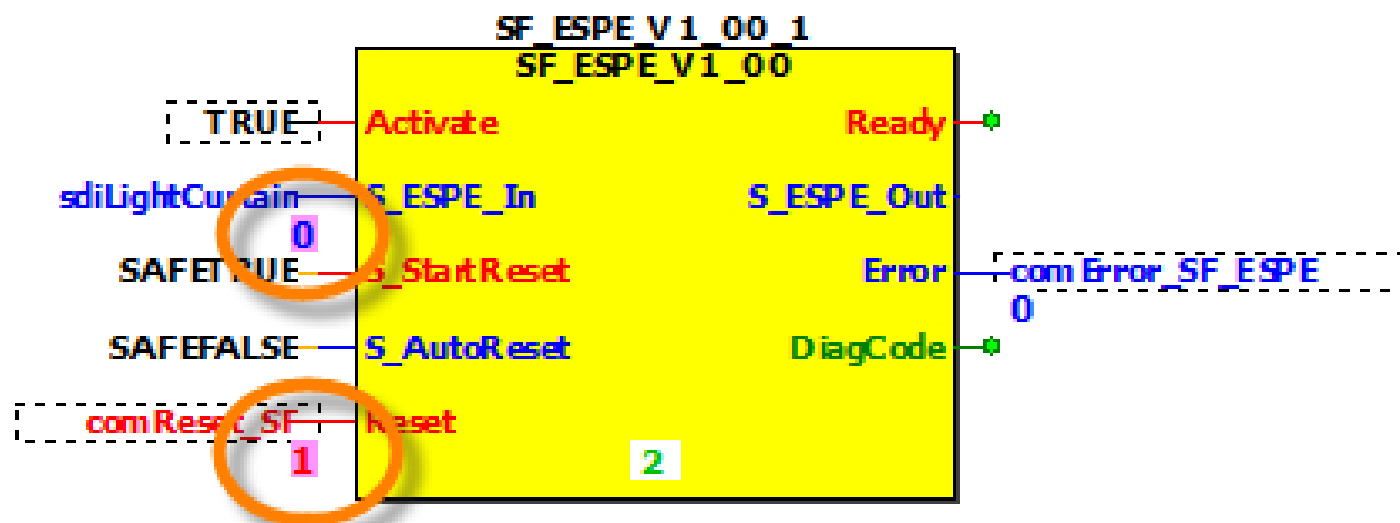
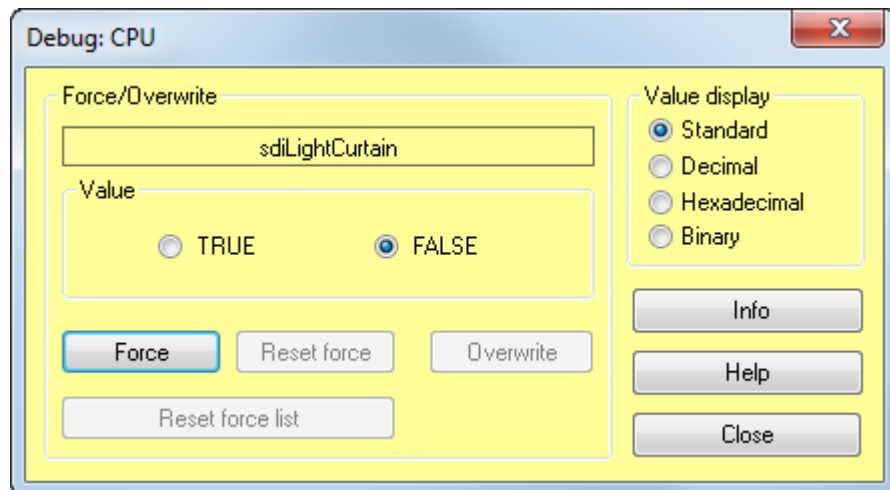
		Name	Online value	Data type	Description	Terminal	Init
1		☐ save digital channels					
2		sdiEStop	TRUE	SAFEBOOL	emergency stop	SL1.SM3.SafeEquivalentInput0304	
3		sdiLightCurtain	TRUE	SAFEBOOL	light curtain	SL1.SM3.SafeEquivalentInput0102	
4		sdoSaw	TRUE	SAFEBOOL	saw output	SL1.SM2.SafeDigitalOutput01	
5		☐ digital channels					
6		doReleaseSaw	TRUE	BOOL	release output	SL1.SM2.ReleaseOutput01	
7		comReset_SF	FALSE	BOOL		SL1.SM1.BOOL101	
8		comError_SF_EStop	FALSE	BOOL		SL1.SM1.BOOL001	
9		comError_SF_ESPE	FALSE	BOOL		SL1.SM1.BOOL002	

Code:Main Global_Vari...



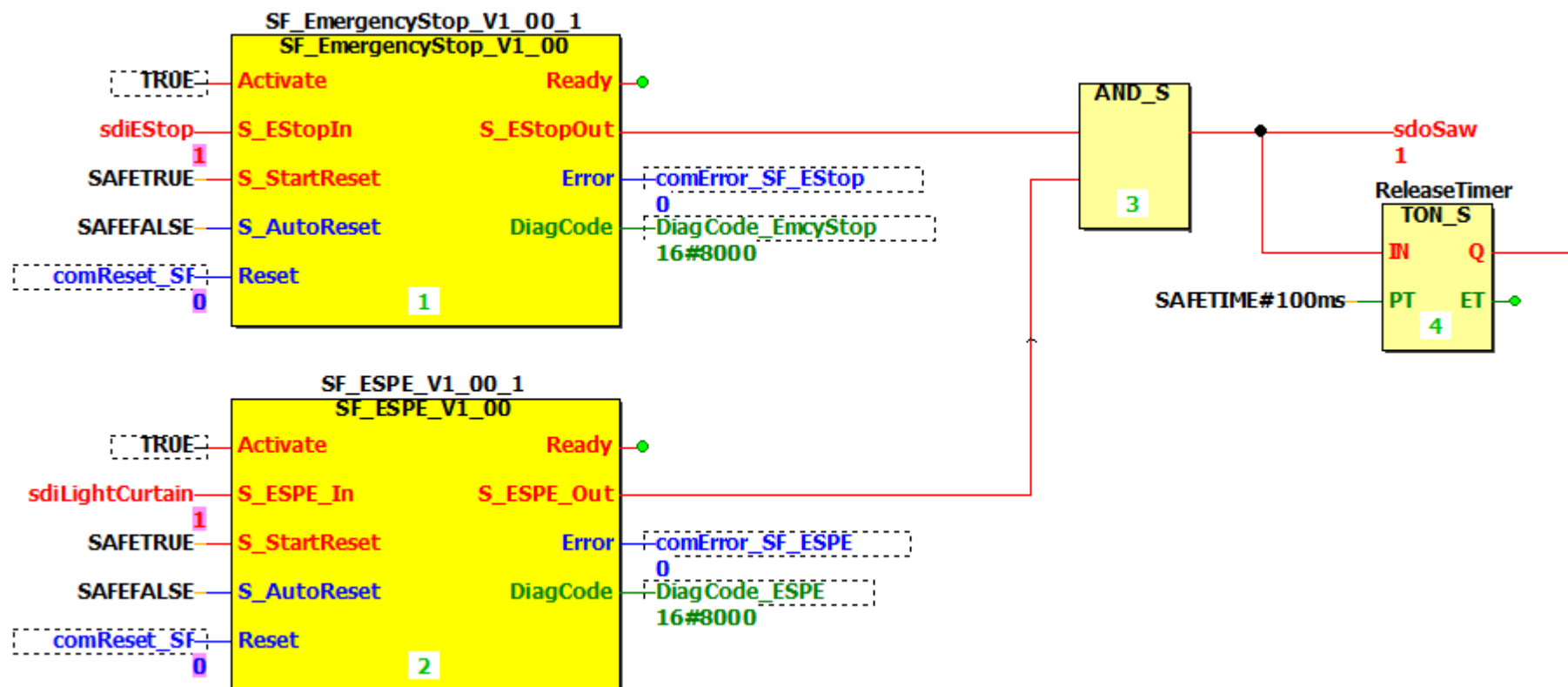
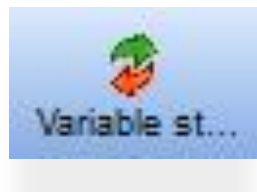


Форсирование переменных





Отслеживание состояния переменных





Окно журнала системных сообщений в Automation Studio

SL1 [Logger] x

Module

Objektname Sicht

Online

System

Anwender

Fieldbus

Safety

Loggereinträge: 1192

	Ebene	Zeit	Fehlernummer	Betriebssystem-Task	Logger Module	Fehlerbeschreibung
1	Information	2013-02-05 14:07:17,000000	122889	DdxloSafetyLogger	Safety	Zeit/Datum geändert
2	Warnung	2007-02-20 10:54:44,062800	70208	DdxloSafetyLogger	Safety	Der SafePLC Status hat sich geändert
3	Fehler	2007-02-20 10:54:44,003600	122896	DdxloSafetyLogger	Safety	Mapping CRC Fehler
4	Fehler	2007-02-20 10:54:44,003600	122895	DdxloSafetyLogger	Safety	Mapping CRC Fehler
5	Fehler	2007-02-20 10:54:43,085700	122896	DdxloSafetyLogger	Safety	Mapping CRC Fehler
6	Fehler	2007-02-20 10:54:43,085700	122895	DdxloSafetyLogger	Safety	Mapping CRC Fehler





Обзор Automation Studio

Настройка онлайн подключения

Получение системной информации

Настройка и поведение системы при исполнении

Создание и анализ переменных процесса

Встроенные методы диагностики приводов

Диагностика интегрированной системы безопасности

