



Expansion module

EM-LON

Description of data points for the
LonWorks interface for EASYLAB/TROX UNIVERSAL
Firmware from 4.0 onwards



Read the instructions prior to performing any task!

TROX GmbH

Heinrich-Trox-Platz

47504 Neukirchen-Vluyn

Germany

Telephone: +49 2845 202-0

Fax: +49 2845 202-265

email: trox@trox.de

Internet: <http://www.troxtechnik.com>

A00000063090, 3, GB/en

06/2019

© TROX GmbH 2017

About this manual

The expansion module EM-LON is used to integrate the following devices into a LonWorks network and in this way connect them to the central BMS:

- EASYLAB controller TCU3
- EASYLAB adapter modules TAM
- TROX UNIVERSAL CONTROLLER

This configuration manual is an addition to the installation manual and contains information on how to configure EM-LON as an interface to the central BMS.

Illustrations in this manual are mainly for information and may differ from the actual design of EM-LON.

Other applicable documentation

In addition to these instructions, the following documents apply:

- Installation manual for expansion module EM-LON
- Documentation on
 - EASYLAB controller TCU3
 - Adapter module TAM
 - TROX UNIVERSAL CONTROLLER
- Project-specific wiring documents, if any

TROX Technical Service

To ensure that your request is processed as quickly as possible, please keep the following information ready:

- Product name
- TROX order number
- Delivery date
- Brief description of the fault

Online	www.troxtechnik.com
Phone	+49 2845 202-400

Limitation of liability

The information in this manual has been compiled with reference to the applicable standards and guidelines, the state of the art, and our expertise and experience of many years.

The manufacturer does not accept any liability for damages resulting from:

- Non-compliance with this manual
- Incorrect use
- Operation or handling by untrained individuals
- Unauthorised modifications
- Technical changes
- Use of non-approved replacement parts

The actual scope of delivery may differ from the information in this manual for bespoke constructions, additional order options or as a result of recent technical changes.

The obligations agreed in the order, the general terms and conditions, the manufacturer's terms of delivery, and the legal regulations in effect at the time the contract is signed shall apply.

We reserve the right to make technical changes.

Defects liability

For details regarding defects liability please refer to Section VI, Warranty Claims, of the Delivery and Payment Terms of TROX GmbH.

The Delivery and Payment Terms of TROX GmbH are available at www.troxtechnik.com.

Copyright

This document, including all illustrations, is protected by copyright and pertains only to the corresponding product.

Any use without our consent may be an infringement of copyright, and the violator will be held liable for any damage.

This applies in particular to:

- Publishing content
- Copying content
- Translating content
- Microcopying content
- Saving content to electronic systems and editing it

1	Security	5
1.1	Correct use.....	5
1.1.1	Incorrect use.....	5
1.2	Safety signs.....	5
1.3	Residual risks.....	5
1.4	Risk of damage to property.....	6
1.5	System owner's responsibility.....	6
1.6	Qualified staff.....	6
1.7	Environmental protection.....	6
2	Commissioning / Configuration	7
2.1	Required TCU3 software version	7
3	Interface information	8
3.1	LonWorks interface.....	8
3.1.1	Configuration parameters.....	11
3.1.2	Input variables.....	13
3.1.3	Output variables.....	17
4	Index	27

1 Security

Safety notes

Symbols are used in this manual to alert readers to areas of potential hazard. Signal words express the degree of the hazard.

DANGER!

Imminently hazardous situation which is due to live components and which, if not avoided, will result in death or serious injury due to electrical voltage.

DANGER!

Imminently hazardous situation which, if not avoided, will result in death or serious injury.

NOTICE!

Potentially hazardous situation which, if not avoided, may result in property damage.

ENVIRONMENT!

Environmental pollution hazard.

1.1 Correct use

Expansion module EM-LON provides a LonWorks interface for EASYLAB base components as well as for the TROX UNIVERSAL CONTROLLER.

Use the expansion module for the following devices:

- EASYLAB controller TCU3
- EASYLAB adapter module TAM
- TROX UNIVERSAL CONTROLLER

1.1.1 Incorrect use

Do not use the expansion module for areas of application that are not described in this manual.

Do not use the expansion module:

- outdoors
- in wet areas
- in areas with potentially explosive atmospheres

Residual risks

Failure of the network interface does not affect the control function of the volume flow controller but does affect data exchange with the central BMS. Safety-related applications require further precautions.

1.2 Safety signs

The following symbols and signs are usually found in the work area. They apply to the very location where they are found.

Electrical voltage



Location where a hazard due to electrical voltage exists.

Earthing



This symbol marks all equipotential bonding connection points on EM-LON.

1.3 Residual risks

EM-LON is a state-of-the-art product and meets current safety requirements. Residual risks cannot be excluded, however, and you should proceed with caution.

Always observe the safety notes in this manual to reduce health hazards and prevent any hazardous situations.

Electric current

DANGER!

Danger of death due to electric current!

Danger of death if live components are touched.

- Switch off the supply voltage and secure it against being switched on again before working on the unit.
- Only skilled qualified electricians are allowed to work on live components.
- Equipotential bonding is required.

1.4 Risk of damage to property

Temperature differences

! NOTICE!**Risk of damage to property due to large temperature differences**

If EM-LON has been kept in an unheated area, condensation may form and damage the electronic components beyond repair.

- Let EM-LON warm up to room temperature before you install it.

Electrostatic charge

! NOTICE!**Risk of damage to property due to electrostatic charge**

Electrostatic charge can damage the electronics of the expansion module.

- Before you remove the expansion module from its protective wrapping, touch an equipotentially bonded metal surface, e.g. a water pipe, for electrical earthing.
- Avoid skin contact with any components or printed circuits on the expansion module or the main PCB.
- Wear conductive footwear and antistatic clothing.

1.5 System owner's responsibility

System owner's obligations

EM-LON is intended for commercial use. The system owner is therefore subject to the legal obligations of occupational health and safety regulations.

In addition to the safety notes in this manual, the applicable regulations for safety, accident prevention and environmental protection must also be complied with.

1.6 Qualified staff

Qualification

The work described in this manual has to be carried out by individuals with the qualification, training, knowledge and experience described below:

Network administrator

Network administrators design, install, configure and maintain the IT infrastructure in companies or organisations.

Any work has to be carried out by individuals who can be expected to carry out their assigned duties reliably. Individuals whose reaction time is delayed due to alcohol, drugs or other medication must not carry out any work.

1.7 Environmental protection

The following substances and materials which are hazardous to the environment are used:

Electrical and electronic parts

Electrical and electronic parts may contain toxic materials and substances. These parts have to be disposed of separately from other waste, i.e. taken to your local reuse and recycling centre or disposed of by a specialist disposal company.

Batteries

Batteries contain toxic heavy metals. They are hazardous waste and must be taken to a hazardous waste collection point or disposed of by a specialist company.

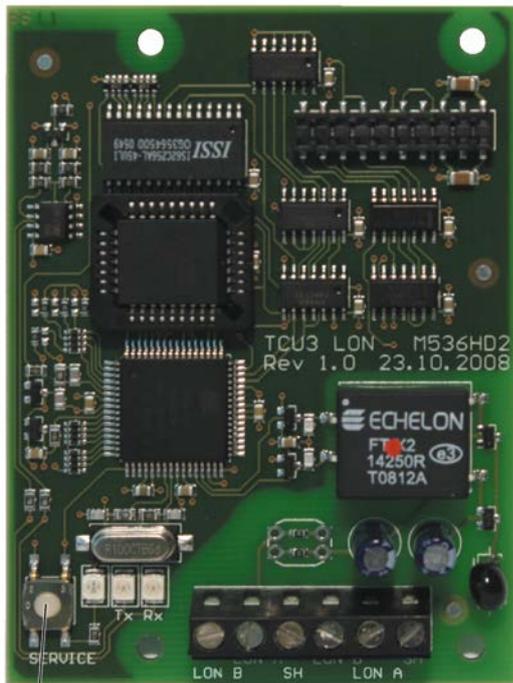
2 Commissioning / Configuration

Personnel:

- Network administrator

Commissioning the LonWorks interface requires detailed technical knowledge and special software, e.g. Echelon LonMaker. Only specialist personnel should do the commissioning.

Commissioning



1. ▶ Press the service pin push button (1) and download the software for the EASYLAB/TROX UNIVERSAL CONTROLLER LonWorks node. The software for EM-LON is available for download on our website.

Binding

2. ▶ Create the logical bindings for the network variables to be transferred by EM-LON. As an alternative, use polling.

Configuration

3. ▶ If necessary, adjust the configuration `nciMaxSendTime` or `nciConfig_Occ`,
 ↪ [page 11](#)

2.1 Required TCU3 software version

The expansion module EM-LON with firmware 4.0 requires the following software versions:

- EASYLAB or adapter module TAM
 - Software version 8.0 or higher
- TROX UNIVERSAL CONTROLLER
 - Software version 2.1 or higher

The software version is displayed in the EasyConnect software, 'Diagnosis', 'Basic Device' line.

A product sticker on the main PCB also carries the software version number (only for version 3 or higher).

With earlier software versions there is no data exchange between the expansion module EM-LON and controller. This means that the network is not able to read out current values from the controller or to send any values.



You need not adapt the controller configuration with the EasyConnect configuration software for the expansion module to work.

3 Interface information

3.1 LonWorks interface

Application

Description of the network variables (SNVT): All variables and parameters are based on standard network variables (SNVT); this ensures integration of expansion module EM-LON into a LonWorks network. The equipment functions that support each variable are listed under the special information for that network variable.

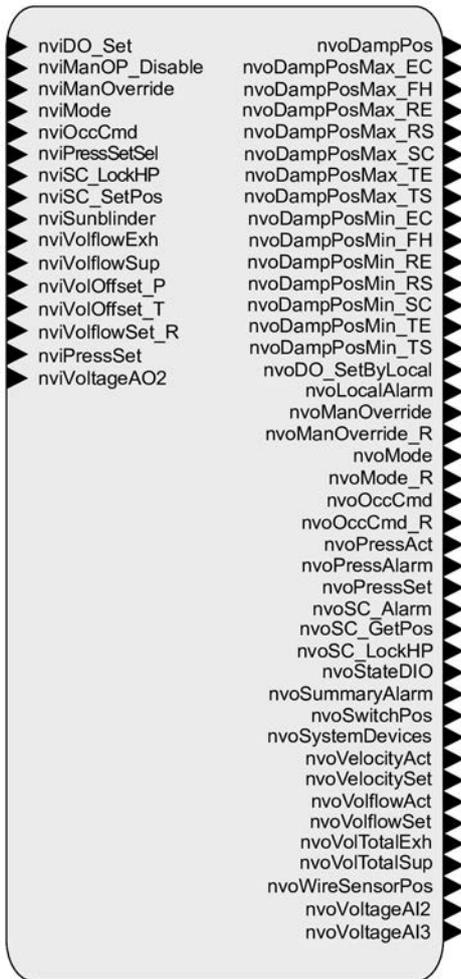


Fig. 1: Virtual function block

Operating mode default setting

- Input variables `nviManOverride` (SNVT_hvac_overid), `nviOccCmd` (SNVT_occu-pancy) and `nviMode` (SNVT_state) are available for operating modes
- `nviManOverride` has the highest LON priority
- `nviMode` has the lowest LON priority

- A configuration of the assignment is possible only for `nviOccCmd` by means of the parameter `nciConfig_Occ` (SCPTdirection)
- The valid binding of an input variable results in a valid operating mode default setting in LON for a single controller or for the room
- The invalid binding of an input variable does not result in an operating mode default setting in LON

Operating modes

- Standard mode**
Standard mode means normal operation in the day-time (in Germany: usually according to DIN 1946, part 7, 25 m³/h extract air per m² main useful floor area)
- Reduced operation**
Low mode in comparison to standard mode, e.g. as a night-time setback
- Increased operation**
High mode in comparison to standard mode, e.g. in an emergency
- Shut-off**
Shut-off of the volume flow controller, e.g. to save energy at night or to shut down the system
- OPEN position**
Open position of the volume flow controller

Abbreviations

EASYPAB:

- FH - Fume cupboard controller
- RR - Room controller for supply air or extract air (RS, RE, PC)
- RR RMF - Room controller with active room management function
- EC, SC - Single controller for supply air or extract air (EC, SC)
- TAM - Adapter module
- TAM RMF - Adapter module with active room management function

TROX UNIVERSAL CONTROLLER:

- RS/RE - Volume flow controllers for supply or extract air
- RS/RE RMF - Volume flow controller with active room management function
- PR*/PD* - Room pressure controller or duct for supply or extract air
- PR*/PD* RMF - Room pressure controller or duct with active room management function

Overview of input variables for LonWorks interface EM-LON

Variable	Data type	Unit									
		TCU3				TAM		TROX UNIVERSAL			
		Available with equipment function									
		FH	RR	RR RMF	EC, SC	TAM	TAM RMF	RS/RE	RS/RE RMF	PR*/PD*	PR*/PD* RMF
nviManOverride	SNVT_hvac_oxid	x ¹		x			x		x		x
nviMode	SNVT_state	x ¹		x			x		x		x
nviOccCmd	SNVT_occupancy	x ¹		x			x		x		x
nviManOP_Disable	SNVT_switch	x ¹		x			x		x		x
nviVolOffset_T	SNVT_switch			x			x				
nviVolOffset_P	SNVT_switch			x			x				
nviPressSetSel	SNVT_switch			x			x				
nviSunblinder	SNVT_switch			x			x		x		x
nviVolflowExh	SNVT_flow	x	x	x		x	x	x	x	x	x
nviVolflowSup	SNVT_flow	x	x	x		x	x	x	x	x	x
nviSC_LockHP	SNVT_switch	not available									
nviSC_SetPos	SNVT_switch	not available									
nviDO_Set	SNVT_state	x	x	x	x	x	x	x	x	x	x
nviVolflowSet_R	SNVT_flow								x		x
nviPressSet	SNVT_press_p									x	x
nviVoltageAO2	SNVT_volt	x	x	x	x	x	x				

Overview of output variables for LonWorks interface EM-LON

Variable	Data type	Unit									
		TCU3				TAM		TROX UNIVERSAL			
		Available with equipment function									
		FH	RR	RR RMF	EC, SC	TAM	TAM RMF	RS/R E	RS/RE RMF	PR*/ PD*	PR*/PD* RMF
nvoManO- override	SNVT_hvac_o verid	x	x	x	x						
nvoManO- override_R	SNVT_hvac_o verid			x			x	x	x	x	x
nvoMode	SNVT_state	x	x	x	x						
nvoMode_R	SNVT_state			x			x	x	x	x	x
nvoOccCmd	SNVT_occu- pancy	x	x	x	x						
nvoOccCmd_R	SNVT_occu- pancy			x			x	x	x	x	x
nvoVolflowSet	SNVT_flow	x	x	x	x			x	x		
nvoVolflowAct	SNVT_flow	x	x	x	x			x	x	x	x
nvoVolTotalExh	SNVT_flow	x	x	x	x	x	x	x	x	x	x
nvoVolTotalSup	SNVT_flow	x	x	x	x	x	x	x	x	x	x
nvoPressSet	SNVT_press_p			x			x			x	x
nvoPressAct	SNVT_press_p			x			x			x	x
nvoLocalAlarm	SNVT_switch	x	x	x	x	x	x	x	x	x	x
nvoSummar- yAlarm	SNVT_switch			x			x	x	x	x	x
nvoPressAlarm	SNVT_switch			x			x	x	x	x	x
nvoVelocitySet	SNVT_speed_ mil	x									
nvoVelocityAct	SNVT_speed_ mil	x									
nvoSwitchPos	SNVT_count	x									
nvoWireSen- sorPos	SNVT_switch	x									
nvoDampPos	SNVT_switch	x	x	x	x			x	x	x	x
nvoSystemDe- vices	SNVT_count	x	x	x	x	x	x	x	x	x	x
nvoStateDIO	SNVT_state	x	x	x	x	x	x	x	x	x	x
nvoSC_LockHP	SNVT_switch	not available									
nvoSC_GetPos	SNVT_switch	not available									
nvoSC_Alarm	SNVT_switch	not available									
nvoDO_SetBy- Local	SNVT_state	x	x	x	x	x	x	x	x	x	x
nvoVoltageAI2	SNVT_volt	x	x	x	x	x	x				

Variable	Data type	Unit									
		TCU3				TAM		TROX UNIVERSAL			
		Available with equipment function									
		FH	RR	RR RMF	EC, SC	TAM	TAM RMF	RS/RE	RS/RE RMF	PR*/PD*	PR*/PD* RMF
nvoVoltageAI3	SNVT_volt	x	x	x	x	x	x				
nvoDamp PosMax_FH	SNVT_switch	x	x	x	x	x	x				
nvoDamp PosMin_FH	SNVT_switch	x	x	x	x	x	x				
nvoDamp PosMax_RE	SNVT_switch	x	x	x	x	x	x	x	x	x	x
nvoDamp PosMin_RE	SNVT_switch	x	x	x	x	x	x	x	x	x	
nvoDamp PosMax_TE	SNVT_switch	x	x	x	x	x	x	x	x	x	
nvoDamp PosMin_TE	SNVT_switch	x	x	x	x	x	x	x	x	x	x
nvoDamp PosMax_RS	SNVT_switch	x	x	x	x	x	x	x	x	x	x
nvoDamp PosMin_RS	SNVT_switch	x	x	x	x	x	x	x	x	x	x
nvoDamp PosMax_EC	SNVT_switch	x	x	x	x	x	x				
nvoDamp PosMin_EC	SNVT_switch	x	x	x	x	x	x				
nvoDamp PosMax_SC	SNVT_switch	x	x	x	x	x	x				
nvoDamp PosMin_SC	SNVT_switch	x	x	x	x	x	x				
nvoDamp PosMax_TS	SNVT_switch	x	x	x	x	x	x	x	x	x	x
nvoDamp PosMin_TS	SNVT_switch	x	x	x	x	x	x	x	x	x	x

3.1.1 Configuration parameters

nciConfig_Occ

Type: SCPTdirection

Equipment functions: FH, RR with RMF, TAM with RMF

Function

- Assignment of SNVT_occupancy functional values to controller or room operating modes
- SNVT_occupancy used for operating mode default setting for a controller or a room
- nviOccCmd and nvoOccCmd are of Type SNVT_occupancy

nciMaxSendTime

Type: SCPTmaxSndT

Equipment functions: FH, EC, SC, RR, TAM, RR with RMF, TAM with RMF

Function

- Minimum updating interval for the LON output variables when the value of the variables remains unchanged

OC_OCCUPIED

Function	Bit			
	0	1	2	3
Standard mode	0	0	0	0
Reduced operation	0	0	0	1
Increased operation	0	0	1	0
Shut-off	0	1	0	0
OPEN position	1	0	0	0

OC_UNOCCUPIED

Function	Bit			
	4	5	6	7
Standard mode	0	0	0	0
Reduced operation	0	0	0	1
Increased operation	0	0	1	0
Shut-off	0	1	0	0
OPEN position	1	0	0	0

OC_BYPASS

Function	Bit			
	8	9	10	11
Standard mode	0	0	0	0
Reduced operation	0	0	0	1
Increased operation	0	0	1	0
Shut-off	0	1	0	0
OPEN position	1	0	0	0

OC_STANDBY

Function	Bit			
	12	13	14	15
Standard mode	0	0	0	0
Reduced operation	0	0	0	1
Increased operation	0	0	1	0
Shut-off	0	1	0	0
OPEN position	1	0	0	0

3.1.2 Input variables

nviManOverride

Type: SNVT_hvac_overid

Equipment function:

- EASYLAB
 - FH, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS with RMF, PR*/PD* with RMF

Function

- SNVT_hvac_overid functional values for operating mode default setting
- FH: Operating mode default setting for a single fume cupboard controller, only with individual operating mode default setting (stand-alone operation)
- RMF: operating mode default setting for the entire room

Default values for nviManOverride

State	Description
HVO_Position	Standard mode
HVO_Close	Shut-off
HVO_Open	OPEN position
HVO_Minimum	Reduced operation
HVO_Maximum	Increased operation
HVO_Nul	No default

nviOccCmd

Type: SNVT_occupancy

Equipment function:

- EASYLAB
 - FH, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS with RMF, PR*/PD* with RMF

Function

- SNVT_occupancy functional value for operating mode default setting
- FH: Operating mode default setting for a single fume cupboard controller, only with individual operating mode default setting (stand-alone operation)
- RMF: operating mode default setting for the entire room

The assignment of functional values to operating modes is stored in the nciConfig_Occ table in the controller and can be configured.

Assignment of functional values to operating modes – basic configuration

Value	Identifier	Operating mode
0	OC_OCCUPIED	Standard mode
1	OC_UNOCCUPIED	Reduced operation
2	OC_BYPASS	Increased operation
3	OC_BYPASS	Shut-off
0xFF	OC_NUL	No default

nviMode

Type: SNVT_state

Equipment function:

- EASYLAB
 - FH, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS with RMF, PR*/PD* with RMF

Function

- SNVT_state functional value for operating mode default setting
- FH: Operating mode default setting for a single fume cupboard controller, only with individual operating mode default setting (stand-alone operation)
- RMF: operating mode default setting for the entire room

Default values for nviMode

Bit	Function	0	1
4/11	OPEN position	inactive	active
3/12	Shut-off	inactive	active
2/13	Increased operation	inactive	active
1/14	Reduced operation	inactive	active
0/15	Standard mode	inactive	active

nviManOp_Disable

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS with RMF, PR*/PD* with RMF

Function

- Upon enabling manual control the corresponding symbol appears on the fume cupboard or room control panels
- For further information on manual control please refer to the EASYLAB design manual.
- The variable includes the 'value' and 'state' fields but only the 'state' field is used.

Default settings for nviManOp_Disable

Value	State	Function
–	0	<ul style="list-style-type: none"> ■ Manual control has been enabled on the control panel ■ Operating mode defaults set on DI override LON defaults
–	1	<ul style="list-style-type: none"> ■ Manual control has been disabled on the control panel ■ Operating mode default settings from LON have the highest priority

nviVolOffset_T

Type: SNVT_switch

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Signalling of an external volume flow rate shift, e.g. for adjusting the room air change rate or for external temperature control
- The shift signal is transferred as a percentage value of a volume flow rate change range that has been configured in the controller
- The variable includes the 'value' and 'state' fields but only the 'value' field is used
- Depending on the room configuration, several controllers will assume the setpoint change function

Default settings for nviVolOffset_T

Value	State	Function
Percentage value	–	External volume flow rate shift for temperature: 0.0 – 100.0 %

nviVolOffset_P

Type: SNVT_switch

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Signalling of a flow rate setpoint shift for external differential pressure control
- The shift signal is transferred as a percentage value of a volume flow rate change range that has been configured in the controller
- The variable includes the 'value' and 'state' fields but only the 'value' field is used

Default settings for nviVolOffset_P

Value	State	Function
Percentage value	–	External volume flow rate shift for differential pressure: 0.0 – 100.0%

nviPressSetSel

Type: SNVT_switch

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- If room pressure control of the EASYLAB system is active, this is the input for switching between two differential pressure setpoint values that are stored in the room management function
- The variable includes the 'value' and 'state' fields

Default settings for nviPressSetSel

Value	State	Function
0	0	Differential pressure setpoint 1
100	1	Differential pressure setpoint 2

nviSunblinder

Type: SNVT_switch

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS with RMF, PR*/PD* with RMF

Function

- Control input signal for shading, connected to the controller or adapter module
- Switch outputs DO5 and DO6 will be used
- This LonWorks default overrides any other defaults from the local room control panel

Default settings for nviSunblinder

Value	State	Description
0	0	Close blinds (activate switch output DO6)
100	1	Open blinds (activate switch output DO5)
0	-1	No default

nviVolflowExh

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - FH, RR, TAM, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Integration of an extract air flow into the system room balance
- This default volume flow is considered for all volume flow calculations (balance and setpoint values)

nviVolflowSup

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - FH, RR, TAM, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Integration of a supply air flow into the system room balance
- This default volume flow is considered for all volume flow calculations (balance and setpoint values)

nviSC_LockHP

Equipment function: not used

nviSC_SetPos

Equipment function: not used

nviDO_Set

Type: SNVT_State

Equipment function:

- EASYLAB
 - FH, EC, SC, RR, TAM, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Signalling to digital outputs (relay) that are not used by the control system

Default values for nviDO_Set

Bit	Function
7	DO1
6	DO2
5	DO3
4	DO4
3	DO5
2	DO6

0 = inactive

1 = active

nviVolflowSet_R

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - not used
- TROX UNIVERSAL
 - RE/RS with RMF, PR*/PD* with RMF

Function

- Default setting of volume flow rate setpoint (room), only for standard mode

nviPressSet

Type: SNVT_flow

Unit Pa

Equipment function:

- EASYLAB
 - not used
- TROX UNIVERSAL
 - PR*/PD*, PR*/PD* with RMF

Function

- Local default setting of room pressure or duct pressure setpoint value

nviVoltageAO2

Type: SNVT_volt

Unit: V

Equipment function:

- EASYLAB
 - FH, EC, SC, RR, TAM, RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Default setting of voltage for analogue output AO2
- 0 – 10 V DC, in increments of 0.1 V

3.1.3 Output variables**nvoManOverride**

Type: SNVT_hvac_overid

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC
- TROX UNIVERSAL
 - not used

Function

- Output of the operating mode for the volume flow controller

nvoManOverride functional values

State	Description
HVO_Position	Standard mode
HVO_Close	Shut-off
HVO_Open	OPEN position
HVO_Minimum	Reduced operation
HVO_Maximum	Increased operation

nvoManOverride_R

Type: SNVT_hvac_overid

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the room operating mode

nvoManOverride_R functional values

State	Description
HVO_Position	Standard mode
HVO_Close	Shut-off
HVO_Open	OPEN position
HVO_Minimum	Reduced operation
HVO_Maximum	Increased operation

nvoMode

Type: SNVT_state

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC
- TROX UNIVERSAL
 - not used

Function

- Output of the operating mode for the volume flow controller

nvoMode functional values

Bit	Function	0	1
11	OPEN position	inactive	active
12	Shut-off	inactive	active
13	Increased operation	inactive	active
14	Reduced operation	inactive	active
15	Standard mode	inactive	active

nvoMode_R

Type: SNVT_state

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the room operating mode

nvoMode_R functional values

Bit	Function	0	1
11	OPEN position	inactive	active
12	Shut-off	inactive	active
13	Increased operation	inactive	active
14	Reduced operation	inactive	active
15	Standard mode	inactive	active

nvoOccCmd

Type: SNVT_occupancy

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC
- TROX UNIVERSAL
 - not used

Function

- Output of the operating mode of the volume flow controller

The assignment of functional values to operating modes is stored in a table in the controller and can be configured. The table for the assignment of SNVT_occupancy functional values to controller or room operating modes can be adapted using the configuration parameter nci-Config_Occ.

nvoOccCmd functional values

Value	Identifier	Operating mode
0	OC_OCCUPIED	Standard mode
1	OC_UNOCCUPIED	Reduced operation
2	OC_BYPASS	Increased operation
3	OC_STANDBY	Shut-off

nvoOccCmd_R

Type: SNVT_occupancy

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the room operating mode

The assignment of functional values to operating modes is stored in a table in the controller and can be configured. The table for the assignment of SNVT_occupancy functional values to room operating modes can be adapted using the configuration parameter nci-Config_Occ.

nvoOccCmd_R functional values (basic configuration)

Value	Identifier	Operating mode
0	OC_OCCUPIED	Standard mode
1	OC_UNOCCUPIED	Reduced operation
2	OC_BYPASS	Increased operation
3	OC_STANDBY	Shut-off

nvoVolfowSet

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF

Function

- Output of the volume flow rate setpoint value for the volume flow controller

nvoVolflowAct

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the volume flow rate actual value of the volume flow controller

nvoVolTotalExh

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the total extract air volume flow rate of a room
- This includes the extract air volume flow rates of all fume cupboards and extract air controllers as well as any additional extract air volume flow rates (constant and variable) from other controllers.

nvoVolTotalSup

Type: SNVT_flow

Unit: l/s

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the total supply air flow rate of an EASYLAB room
- This includes the supply air volume flow rates of all supply air controllers as well as the additional supply air volume flow rates (constant and variable)

nvoPressSet

Type: SNVT_press_p

Unit: Pa

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - PR*/PD*, PR*/PD* with RMF

Function

- Output of the differential pressure control setpoint value

nvoPressAct

Type: SNVT_press_p

Unit: Pa

Equipment function:

- EASYLAB
 - RR with RMF, TAM with RMF
- TROX UNIVERSAL
 - PR*/PD*, PR*/PD* with RMF

Function

- Output of the differential pressure control actual pressure value
- The actual value is recorded by a differential pressure transducer connected to the RR with RMF or to the TAM with RMF.

nvoLocalAlarm

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of a local alarm for a fume cupboard controller, extract air controller, supply air controller, room controller or TAM – Alarm conditions can be defined using the EasyConnect configuration software

nvoLocalAlarm functional values

Value	State	Description
0	0	Local alarm is inactive
100	1	Local alarm is active

nvoSummaryAlarm

Type: SNVT_switch

Equipment function:

- EASYLAB
 - RR with RMF and TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of a consolidated alarm
- An alarm signal is generated when a controller emits an alarm or fault message.
- Alarm conditions can be defined using the EasyConnect configuration software.
- Standard configuration: volume flow rate alarm.

nvoSummaryAlarm functional values

Value	State	Description
0	0	Consolidated alarm is inactive
100	1	Consolidated alarm is active

nvoPressAlarm

Type: SNVT_switch

Equipment function:

- EASYLAB
 - RR with RMF and TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of a room pressure alarm when room pressure control is active.
- Alarm conditions can be defined using the EasyConnect configuration software.

nvoPressAlarm functional values

Value	State	Description
0	0	Room pressure alarm inactive
100	1	Room pressure alarm active

nvoVelocitySet

Type: SNVT_speed_mil

Unit: m/s

Equipment function:

- EASYLAB
 - FH
- TROX UNIVERSAL
 - not used

Function

- Output of the face velocity setpoint value if the fume cupboard controller is equipped with a face velocity transducer (FH-VS)

nvoVelocityAct

Type: SNVT_speed_mil

Unit: m/s

Equipment function:

- EASYLAB
 - FH
- TROX UNIVERSAL
 - not used

Function

- Output of the face velocity actual value if the fume cupboard controller is equipped with a face velocity transducer (FH-VS)

nvoSwitchPos

Type: SNVT_count

Equipment function:

- EASYLAB
 - FH
- TROX UNIVERSAL
 - not used

Function

- Output of the current switching step of the fume cupboard as a numeric value if the fume cupboard controller is equipped with switch contacts for 2-point or 3-point control (FH2P, FH3P)

nvoSwitchPos functional values

Value	Description
1	Switching step 1
2	Switching step 2
3	Switching step 3
0	invalid

nvoWireSensorPos

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH
- TROX UNIVERSAL
 - not used

Function

- Output of the actual sash position of the fume cupboard as a percentage (value) between closed position (0 %) and open position (100 %). Only works if the fume cupboard controller is equipped with a sash distance sensor (FH-DS, FH-DV, FH-VD)

nvoDampPos

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position
- Damper blade position 0 – 100 %

nvoSystemDevices

Type: SNVT_count

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Number of identified EASYLAB system components

nvoStateDIO

Type: SNVT_state

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Bit string indicating the states of the switch inputs and outputs of the controller or adapter module

Bit list

us16_varState_IO	LonWorks bit
Switching state DO6	2
Switching state DO5	3
Switching state DO4	4
Switching state DO3	5
Switching state DO2	6
Switching state DO1	7
Switching state DI6	10
Switching state DI5	11
Switching state DI4	12
Switching state DI3	13
Switching state DI2	14
Switching state DI1	15

nvoSC_LockHP

Equipment function: not used

nvoSC_GetPos

Equipment function: not used

nvoSC_Alarm

Equipment function: not used

nvoDO_SetByLocal

Type: SNVT_state

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Feedback from digital outputs (relays) which are used by the control system and can hence not receive signals from external devices

Default values for nvoDO_SetByLocal

Bit	Function
7	DO1
6	DO2
5	DO3
4	DO4
3	DO5
2	DO6
0 = inactive	
1 = active	

nvoVoltageAI2

Type: SNVT_volt

Unit: V

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the voltage at analogue input AI2
- 0 – 10 V DC, in increments of 0.1 V

nvoVoltageAI3

Type: SNVT_volt

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the voltage at analogue input AI3
- 0 – 10 V DC, in increments of 0.1 V

3.1.3.1 Additional information for nvoDampMin_** and nvoDampMax_** functional values

nvoDampPosMax_** (State)

0 = All damper blades in standard operating mode. Override is possible.

–1 = All damper blades in OPEN position (special operating mode, value = 100 %). Override is possible.

1 = At least one damper blade in OPEN position (special operating mode)

nvoDampPosMin_** (State)

0 = All damper blades in standard operating mode. Override is possible.

–1 = All damper blades in shut-off mode (special operating mode, value = 0 %). Intervention is not possible.

1 = At least one damper blade in shut-off mode (special operating mode).

nvoDampPosMax_FH

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the damper blade position of the fume cupboard controller with the widest open damper blade
- For the evaluation of the damper blade positions in separate extract air systems (2 fans), i.e. fume cupboard extract air and room extract air

nvoDampPosMax_FH functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_FH

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the damper blade position of the fume cupboard controller with the least wide open damper blade
- For the evaluation of the damper blade positions in separate extract air systems (2 fans), i.e. fume cupboard extract air and room extract air

nvoDampPosMin_FH functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_RE

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the room extract air controller with the widest open damper blade
- For the evaluation of the damper blade positions in separate extract air systems (2 fans), i.e. fume cupboard extract air and room extract air

nvoDampPosMax_RE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_RE

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the room extract air controller with the least wide open damper blade
- For the evaluation of the damper blade positions in separate extract air systems (2 fans), i.e. fume cupboard extract air and room extract air

nvoDampPosMin_RE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_TE

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*

Function

- Output of the damper blade position of the fume cupboard or extract air or room extract air controller with the widest open damper blade
- For the evaluation of the damper blade positions in the extract air system (1 fan) for fume cupboard, extract air and room extract air
- When used with TROX UNIVERSAL:
 - Output of the position of the extract air damper blade within the system which is closest to the open position 1, 3, 4

nvoDampPosMax_TE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_TE

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the fume cupboard or extract air or room extract air controller with the least wide open damper blade
- For the evaluation of the damper blade positions in the extract air system (1 fan) for fume cupboard, extract air and room extract air
- When used with TROX UNIVERSAL:
 - Output of the position of the extract air differential pressure control damper blade within the system which is closest to the closed position 1, 3, 4

nvoDampPosMin_TE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_RS

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the room supply air controller with the widest open damper blade

nvoDampPosMax_RS functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_RS

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the room supply air controller with the least wide open damper blade

nvoDampPosMin_RS functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_EC

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the damper blade position of the extract air controller with the widest open damper blade
- For the evaluation of the damper blade positions in separate extract air systems (2 fans), i.e. fume cupboard, extract air and room extract air

nvoDampPosMax_EC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_EC

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the damper blade position of the extract air controller with the least wide open damper blade
- For the evaluation of the damper blade positions in separate extract air systems (2 fans), i.e. fume cupboard, extract air and room extract air

nvoDampPosMin_EC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_SC

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the damper blade position of the supply air controller with the widest open damper blade
- For the evaluation of the damper blade positions in separate supply air systems (2 fans), i.e. supply air and room supply air

nvoDampPosMax_SC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_SC

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - not used

Function

- Output of the damper blade position of the supply air controller with the least wide open damper blade
- For the evaluation of the damper blade positions in separate supply air systems (2 fans), i.e. supply air and room supply air

nvoDampPosMin_SC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_TS

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the room supply air or room extract air controller with the widest open damper blade
- For the evaluation of the damper blade positions in supply air systems (1 fan) for supply air and room supply air
- When used with TROX UNIVERSAL:
 - Output of the position of the supply air duct differential pressure control damper blade within the system which is closest to the open position 1, 3, 4

nvoDampPosMax_TS functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_TS

Type: SNVT_switch

Equipment function:

- EASYLAB
 - FH, RR, RR with RMF, EC, SC, TAM, TAM with RMF
- TROX UNIVERSAL
 - RE/RS, RE/RS with RMF, PR*/PD*, PR*/PD* with RMF

Function

- Output of the damper blade position of the room supply air or room extract air controller with the least open damper blade
- For the evaluation of the damper blade positions in supply air systems (1 fan) for supply air and room supply air
- When used with TROX UNIVERSAL:
 - Output of the position of the supply air duct differential pressure control damper blade within the system which is closest to the closed position 1, 3, 4

nvoDampPosMin_TS functional values

Value	State
Damper blade position	Additional information

4 Index

C

Copyright.....	3
Correct use.....	5

D

Damage to property.....	6
Defects liability.....	3

E

Electric current.....	5
Electrostatic charge.....	6
Environmental protection	
Batteries.....	6
Electrical and electronic parts.....	6
Rechargeable batteries.....	6

H

Hotline.....	3
--------------	---

I

Incorrect use.....	5
Interface information	
LonWorks.....	8

L

Limitation of liability.....	3
------------------------------	---

O

Other applicable documentation.....	3
-------------------------------------	---

Q

Qualification.....	6
--------------------	---

R

Residual risks.....	5
---------------------	---

S

Security.....	5
Service.....	3
Signs.....	5
Software version.....	7
Staff.....	6
Symbols.....	5
System owner's obligations.....	6

T

Technical service.....	3
Temperature differences.....	6

TROX[®] TECHNİK

The art of handling air

TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany

+49 2845 202-0
+49 2845 202-265
trox@trox.de
<http://www.troxtechnik.com>

© TROX GmbH 2017