



EXPANSION MODULE LON
FTT 10



**LONMARK[®]
PARTNER**

LONMARK-PARTNER

TYPE EM-LON

LONWORKS INTERFACE FOR EASYLAB CONTROLLERS AND ADAPTER MODULES

Expansion module for EASYLAB fume cupboard controllers, room controllers, extract air controllers, supply air controllers, and adapter modules, for the integration of rooms or individual volume flow controllers with the central BMS

- LonWorks FTT-10A interface
- Communication only using standard network variables (SNVT)
- The expansion module is fitted into the casing with the EASYLAB base component
- Easy retrofitting
- Double-stack terminal blocks for the LonWorks network
- Service pin push button and corresponding indicator light

Interface to central BMS

- When used on a controller with active room management function (RMF) the module provides also data points for the entire room, e.g. for total volume flows or consolidated alarms
- When used on a single controller: data points for volume flow rate, alarm, damper blade position, or others
- Centralised operating mode default setting, e.g. night-time operation

Application

Application

- Expansion module Type EM-LON for the EASYLAB system
- LonWorks FTT-10A interface to the central BMS
- Data points for individual controllers or for the room
- Room interface: Default setting of room operating modes within the EASYLAB system, increase or reduction of the air change rate, readout of the actual room operating values or evaluated damper blade positions, consolidated alarms
- Controller interface: Operating mode default setting for a single fume cupboard controller, readout of individual operating values such as volume flow rates for single controllers, or individual alarms
- Can be used with fume cupboard, supply air, extract air or differential pressure controller EASYLAB TCU3 and with adapter module TAM
- For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements
- Factory mounted or for retrofitting into the EASYLAB base component casing

Special characteristics

- LonWorks free topology network with an arbitrary number of branches (star, line, and arbitrary combinations)
- Communication only using standard network variables (SNVT)
- Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- System integration (binding) into the LonWorks network is required

Description

Parts and characteristics

- Microprocessor with basis programme stored in nonvolatile memory to load LonWorks applications
- LonWorks transceiver FTT-10A – free topology – twisted pair
- Double stack terminal block for LonWorks network (simple wiring)
- Service pin push button and corresponding indicator light for sending the Neuron ID required for system integration
- Two indicator lights to indicate 'sending data' and 'receiving data'

Construction features

- PCB dimensions and fixing points correspond to the EASYLAB main PCB and the casing
- Fixing with screws
- Pin header to connect the module to the main PCB of the TCU3 or TAM

TECHNICAL INFORMATION

Function, Technical data, Specification text, Order code, Related products

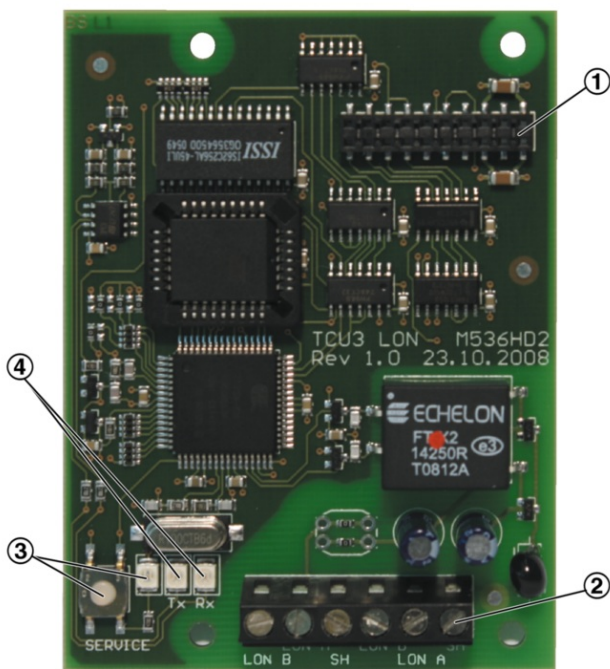


The expansion module EM-LON supplements the EASYLAB base components (controller TCU3 or adapter module TAM) with a LonWorks interface to link rooms or individual volume flow controllers to the central BMS.

The LonWorks interface supports the EASYLAB room operating mode concept. It is possible to set operating mode defaults in order to control different volume flow rates for daytime and night-time operation; it is also possible to increase or reduce the air change rate by a certain amount (volume flow rate setpoint change), e.g. to influence the room temperature.

Using the LonWorks interface, an individual alarm management system can be set up by consolidating configurable EASYLAB alarms. The interface also enables the transfer of actual operating values such as volume flow rates and damper blade position for a controller or for all controllers in a room.

EM-LON



- ① Plug base for connection with the EASYLAB main PCB
- ② Terminals for the LonWorks network
- ③ Service pin push button and corresponding indicator light
- ④ Indicator lights – data transfer

Supply voltage	5 V DC from controller or adapter module
Communication interface	LonWorks-Transceiver FTT-10A, free topology, twisted pair
Connection to LonWorks network	6 terminals for cable cross sections of 0.12 – 1.5 mm ² (LON A, LON B and screen, two of each)
Operating temperature	0 – 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU
Dimensions (B x H x T)	78 x 65 x 100 mm

Expansion module to supplement an EASYLAB base component (controller TCU3 or adapter module TAM) with a LonWorks interface to link rooms or individual volume flow controllers to the central BMS.

The expansion module includes a LonWorks transceiver FTT-10A (free topology, twisted pair), a service pin push button for LonWorks integration, and indicator lights for 'sending data' and 'receiving data'.

Special characteristics

- LonWorks free topology network with an arbitrary number of branches (star, line, and arbitrary combinations)
- Communication only using standard network variables (SNVT)
- Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- System integration (binding) into the LonWorks network is required

Technical data

- Communication: LonWorks-Transceiver FTT-10A, free topology, twisted pair
- Connection to LonWorks using the double-stack terminal blocks

Data points for a single controller

- Volume flow rate actual and setpoint values
- Damper blade position
- Operating mode
- Alarm/status messages
- Total supply air and total extract air actual values (room)
- Evaluated damper blade positions for all controllers in a room
- Number of controllers within the EASYLAB system
- Integration of volume flows
- Status of the digital inputs and outputs

Additional data points for a fume cupboard controller

- Operating mode default setting for the fume cupboard controller equipped with the expansion module
- Selection of priority for operating mode default setting
- Face velocity actual value and setpoint value (only for fume cupboard controllers with face velocity transducer, equipment function FH-VS)

Data points for an EASYLAB room

- Operating mode default setting for the room: Just one data point is required to set the default operating mode for all controllers in a room
- Selection of priority for operating mode default setting (central BMS or room)
- Room operating mode
- Volume flow rate setpoint change (by the central BMS, for example) for an external temperature or differential pressure control
- Setpoint value switching for differential pressure control: Switching between two differential pressure setpoint values
- Total supply air and total extract air actual values (room)
- Evaluated damper blade positions for all controllers in a room
- Room differential pressure actual and setpoint values
- Room pressure alarm
- Number of controllers within the EASYLAB system
- Integration of volume flows
- Status of the digital inputs and outputs
- Configurable consolidated alarm (operating statuses, hardware faults)
- Control input signal for sun protection/blinds (to be provided by others)

- Any attachments are to be defined with the order code of the VAV terminal unit.
- Retrofit possible

ELAB / ...L... / ...

EM – LON

Single controller, EASYLAB room, LonWorks interface, Product details



Single controller

Interface for one EASYLAB controller

- Local data interface for a fume cupboard controller, supply air controller, extract air controller, or adapter module TAM

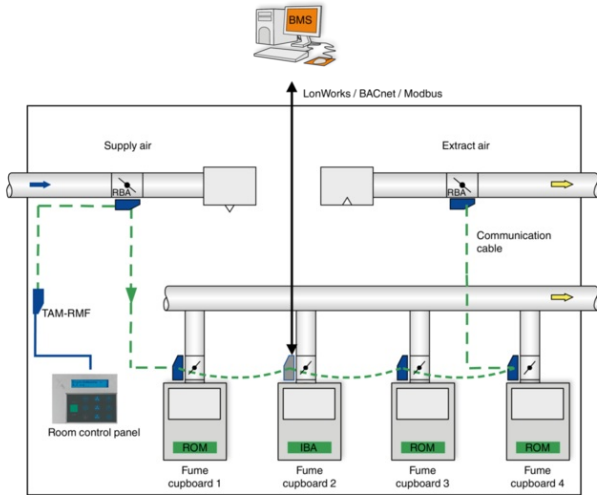
Data points for a single controller

- Volume flow rate actual and setpoint values
- Damper blade position
- Operating mode
- Alarm/status messages
- Total supply air and total extract air actual values (room)
- Evaluated damper blade positions for all controllers in a room
- Number of controllers within the EASYLAB system
- Integration of volume flows
- Status of the digital inputs and outputs

Additional data points for a fume cupboard controller

- Operating mode default setting for the fume cupboard controller equipped with the expansion module
- Selection of priority for operating mode default setting
- Face velocity actual value and setpoint value (only for fume cupboard controllers with face velocity transducer, equipment function FH-VS)

LonWorks, BACnet or Modbus interface on a single controller, e.g. fume cupboard controller



- BMS central building management system
- RMF Controller with active room management function
- ROM Room operating mode, from the room control panel
- IOM Individual operating mode, transmitted via BACnet or Modbus interface

EASYLAB room

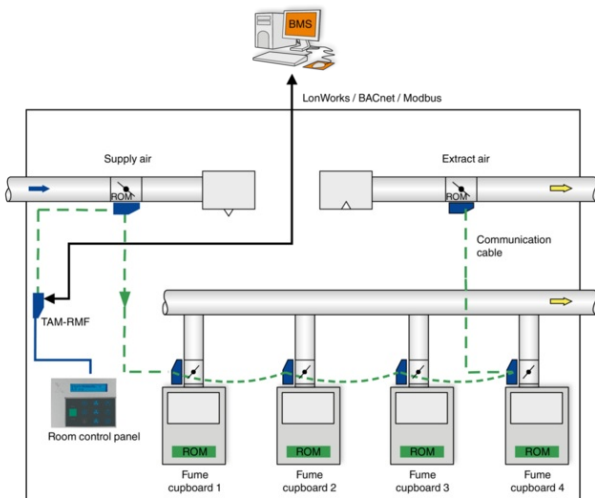
Interface for one EASYLAB room

- Local data interface for a TCU3 room controller (supply air or extract air) or TAM adapter module with active room management function
- Room management function reduces the required number of network data points and hence the commissioning costs
- Transmission of local data for the single controller and for the room

Data points for an EASYLAB room controller

- Operating mode default setting for the room: Just one data point is required to set the default operating mode for all controllers in a room
- Selection of priority for operating mode default setting (central BMS or room)
- Room operating mode
- Volume flow rate setpoint change (by the central BMS, for example) for an external temperature or differential pressure control
- Setpoint value switching for differential pressure control: Switching between two differential pressure setpoint values
- Total supply air and total extract air actual values (room)
- Evaluated damper blade positions for all controllers in a room
- Room differential pressure actual and setpoint values
- Room pressure alarm
- Number of controllers within the EASYLAB system
- Integration of volume flows
- Status of the digital inputs and outputs
- Configurable consolidated alarm (operating statuses, hardware faults)
- Control input signal for sun protection/blinds (to be provided by others)

LonWorks, BACnet or Modbus interface for an EASYLAB room, e.g. on a room controller with active room management function



BMS central building management system

RMF Controller with active room management function

ROM Room operating mode, from the controller with room management function

LonWorks interface

Description of network variables (SNVT)

All variables and parameters are based on standard network variables (SNVT); this ensures integration of the 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.

Abbreviations

- FH: Fume cupboard controller

- EC/SC: Extract air controller / supply air controller
- RR: Room controller for supply air or extract air
- TAM: Adapter module
- RR-RMF: Room controller with active room management function
- TAM-RMF: Adapter module with active room management function

Operating mode default setting

- Input variables nviManOverride (SNVT_hvac_overid), nviOccCmd (SNVT_occupancy) 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 daytime (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 mode

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

Overview of input variables for LonWorks interface EM-LON

Variable	Data type	Unit						Meaning
		TCU3			TAM			Meaning
Variable	Data type	Available with equipment function						Meaning
		FH	RR	RR RMF	EC, SC	TAM	TAM RMF	Meaning
nviManOverride	SNVT_hvac_overid	x ¹		x			x	Operating mode default setting for controller or room
nviMode	SNVT_state	x ¹		x			x	Operating mode default setting for controller or room
nviOccCmd	SNVT_occupancy	x ¹		x			x	Operating mode default setting for controller or room
nviManOP_Disable	SNVT_switch	x ¹		x			x	Enabling/disabling manual control
nviVolOffset_T	SNVT_switch			x			x	Signalling of a volume flow rate setpoint change for temperature control
nviVolOffset_P	SNVT_switch			x			x	Signalling of a volume flow rate setpoint change for differential pressure control
nviPressSetSel	SNVT_switch			x			x	Switching between differential pressure setpoint values 1 and 2
nviSunblinder	SNVT_switch			x			x	Control input signal for sun protection/blinds
nviVolflowExh	SNVT_flow	x	x	x		x	x	Connection of an extract air flow
nviVolflowSup	SNVT_flow	x	x	x		x	x	Connection of a supply air flow
nviSC_LockHP	SNVT_switch							Close and lock sash, high priority
nviSC_SetPos	SNVT_switch							Default setting from central BMS: Close sash
nviDO_Set	SNVT_state	x	x	x	x	x	x	Signalling to relays which are not used by the control system
nviVolflowSet_R	SNVT_flow							Default setting of volume flow rate setpoint (room), only for standard mode
nviPressSet	SNVT_press_p							Local default setting of room pressure or duct pressure setpoint value
nviVoltageAO2	SNVT_volt	x	x	x	x	x	x	Default setting of voltage for output AO2

¹ only for individually selected operating mode (stand-alone operation)

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

Overview of output variables for LonWorks interface EM-LON

Variable	Data type	Unit						Meaning
		TCU3			TAM			Meaning
Variable	Data type	Available with equipment function						Meaning
		FH	RR	RR RMF	EC, SC	TAM	TAM RMF	Meaning
nvoManOverride	SNVT_hvac_overid	x	x	x	x			Operating mode for a single controller
nvoManOverride_R	SNVT_hvac_overid			x			x	Operating mode for the room
nvoMode	SNVT_state	x	x	x	x			Operating mode for a single controller

nvoMode_R	SNVT_state			x			x	Operating mode for the room
nvoOccCmd	SNVT_occupancy	x	x	x	x			Operating mode for a single controller
nvoOccCmd_R	SNVT_occupancy			x			x	Operating mode for the room
nvoVolflowSet	SNVT_flow	x	x	x	x			Volume flow rate setpoint value for the controller
nvoVolflowAct	SNVT_flow	x	x	x	x			Volume flow rate actual value for the controller
nvoVoTotalExh	SNVT_flow	x	x	x	x	x	x	Total extract air for the room
nvoVoTotalSup	SNVT_flow	x	x	x	x	x	x	Total supply air for the room
nvoPressSet	SNVT_press_p			x			x	Differential pressure setpoint value for the room
nvoPressAct	SNVT_press_p			x			x	Differential pressure actual value for the room
nvoLocalAlarm	SNVT_switch	x	x	x	x	x	x	Alarm for the single controller
nvoSummaryAlarm	SNVT_switch			x			x	Consolidated alarm for the room
nvoPressAlarm	SNVT_switch			x			x	Differential pressure alarm
nvoVelocitySet	SNVT_speed_mil	x						Face velocity actual value
nvoVelocityAct	SNVT_speed_mil	x						Face velocity setpoint value
nvoSwitchPos	SNVT_count	x						Sash position (stage 1,2,3)
nvoWireSensorPos	SNVT_switch	x						Sash position (sash opening %)
nvoDampPos	SNVT_switch	x	x	x	x			Damper blade position of single controller
nvoSystemDevices	SNVT_count	x	x	x	x	x	x	Number of EASYLAB controllers
nvoStateDIO	SNVT_state	x	x	x	x	x	x	State of the digital inputs and outputs (TCU3)
nvoSC_LockHP	SNVT_switch							Feedback, sash has been locked, high priority
nvoSC_GetPos	SNVT_switch							Signalling of position status
nvoSC_Alarm	SNVT_switch							Signal for automatic sash device
nvoDO_SetByLocal	SNVT_state	x	x	x	x	x	x	Indicates which relay is already being used by the controller
nvoVoltageAI2	SNVT_volt	x	x	x	x	x	x	Actual voltage at input AI2
nvoVoltageAI3	SNVT_volt	x	x	x	x	x	x	Actual voltage at input AI3
nvoDampPosMax_FH	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position for fume cupboards – max
nvoDampPosMin_FH	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position for fume cupboards – min
nvoDampPosMax_RE	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position, extract air – max
nvoDampPosMin_RE	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position, extract air – min
nvoDampPosMax_TE	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position, total extract air – max
nvoDampPosMin_TE	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position, total extract air – min
nvoDampPosMax_RS	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position, supply air – max
nvoDampPosMin_RS	SNVT_switch	x	x	x	x	x	x	Evaluated damper blade position, supply air – min

nvoDampPosMax_EC	SNVT_switch	x	x	x	x	x	x	Output of the damper blade position of the extract air controller with the widest open damper blade
nvoDampPosMin_EC	SNVT_switch	x	x	x	x	x	x	Output of the damper blade position of the extract air controller with the least wide open damper blade
nvoDampPosMax_SC	SNVT_switch	x	x	x	x	x	x	Output of the damper blade position of the supply air controller with the widest open damper blade
nvoDampPosMin_SC	SNVT_switch	x	x	x	x	x	x	Output of the damper blade position of the supply air controller with the least wide open damper blade
nvoDampPosMax_TS	SNVT_switch	x	x	x	x	x	x	Output of the damper blade position of the supply air controller with the widest open damper blade
nvoDampPosMin_TS	SNVT_switch	x	x	x	x	x	x	Output of the damper blade position of the supply air controller with the least wide open damper blade

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

Virtual function block

nviDO_Set	nvoDampPos
nviManOP_Disable	nvoDampPosMax_EC
nviManOverride	nvoDampPosMax_FH
nviMode	nvoDampPosMax_RE
nviOccCmd	nvoDampPosMax_RS
nviPressSetSel	nvoDampPosMax_SC
nviSC_LockHP	nvoDampPosMax_TE
nviSC_SetPos	nvoDampPosMax_TS
nviSunblinder	nvoDampPosMin_EC
nviVolflowExh	nvoDampPosMin_FH
nviVolflowSup	nvoDampPosMin_RE
nviVolOffset_P	nvoDampPosMin_RS
nviVolOffset_T	nvoDampPosMin_SC
nviVolflowSet_R	nvoDampPosMin_TE
nviPressSet	nvoDampPosMin_TS
nviVoltageAO2	nvoDO_SetByLocal
	nvoLocalAlarm
	nvoManOverride
	nvoManOverride_R
	nvoMode
	nvoMode_R
	nvoOccCmd
	nvoOccCmd_R
	nvoPressAct
	nvoPressAlarm
	nvoPressSet
	nvoSC_Alarm
	nvoSC_GetPos
	nvoSC_LockHP
	nvoStateDIO
	nvoSummaryAlarm
	nvoSwitchPos
	nvoSystemDevices
	nvoVelocityAct
	nvoVelocitySet
	nvoVolflowAct
	nvoVolflowSet
	nvoVolTotalExh
	nvoVolTotalSup
	nvoWireSensorPos
	nvoVoltageAI2
	nvoVoltageAI3

Configuration parameter

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.

Input variables

nviManOverride

Type: SNVT_hvac_overid

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

nviOccCmd

Type: SNVT_occupancy

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

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

nviMode

Type: SNVT_state

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

nviManOp_Disable

Type: SNVT_switch

Equipment functions: FH, RR with RMF, TAM 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.

nviVolOffset_T

Type: SNVT_switch

Equipment functions: RR with RMF, TAM with RMF

Function

- Signalling of an external volume flow rate setpoint change, e.g. for adjusting the room air change rate or for external temperature control
- The change 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

nviVolOffset_P

Type: SNVT_switch

Equipment functions: RR with RMF, TAM with RMF

Function

- Signalling of a flow rate setpoint change for external differential pressure control
- The change 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

nviPressSetSel

Type: SNVT_switch

Equipment functions: RR with RMF, TAM with RMF

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

nviSunblinder

Type: SNVT_switch

Equipment functions: RR with RMF, TAM with RMF

from firmware version EM-LON 2.0 and TCU3, TAM 3.0

Function

- Control input signal for sun protection/blinds, 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

nviVolflowExh

Type: SNVT_flow, unit l/s

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

from firmware version EM-LON 2.0 and TCU3, TAM 3.0

Function

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

nviVolflowSup

Type: SNVT_flow, unit l/s

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

from firmware version EM-LON 2.0 and TCU3, TAM 3.0

Function

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

nviSC_LockHP

Type: SNVT_switch

Function

- Control of an automatic sash device, high priority

nviSC_SetPos

Type: SNVT_switch

Function

- Control of an automatic sash device

nviDO_Set

Type: SNVT_State

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

Function

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

nviVolflowSet_R

Typ: SNVT_flow

Function

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

nviPressSet

Typ: SNVT_flow

Function

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

nviVoltageAO2

Type: SNVT_volt, unit V

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

from firmware version EM-LON 4.0 and TCU3, TAM 7.0

Function

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

Output variables

nvoManOverride

Type: SNVT_hvac_overid

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

Function

- Output of the operating mode for the volume flow controller

nvoManOverride_R

Type: SNVT_hvac_overid

Equipment functions: RR with RMF, TAM with RMF

Function

- Output of the room operating mode

nvoMode

Type: SNVT_state

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

Function

- Output of the operating mode for the volume flow controller

nvoMode_R

Type: SNVT_state

Equipment functions: RR with RMF, TAM with RMF

Function

- Output of the room operating mode

nvoOccCmd

Type: SNVT_occupancy

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

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 functional values of SNVT_occupancy in controller or room operating modes can be adapted by means of nciConfig_Occ.

nvoOccCmd_R

Type: SNVT_occupancy

Equipment functions: RR with RMF, TAM 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 nciConfig_Occ.

nvoVolflowAct

Type: SNVT_flow, unit: l/s

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

Function

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

nvoVolflowSet

Type: SNVT_flow, unit: l/s

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

Function

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

nvoVolTotalExh

Type: SNVT_flow, unit: l/s

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

Function

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

nvoVolTotalSup

Type: SNVT_flow, unit: l/s

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

nvoVelocityAct

Type: SNVT_speed_mil, unit: m/s

Equipment function: FH

Function

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

nvoVelocitySet

Type: SNVT_speed_mil, unit: m/s

Equipment function: FH

Function

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

nvoWireSensorPos

Type: SNVT_switch

Equipment function: FH

Function

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

nvoSwitchPos

Type: SNVT_count

Equipment function: FH

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 (FH-2P, FH-3P)

nvoPressAct

Type: SNVT_press_p, unit: Pa

Equipment functions: RR with RMF, TAM with RMF

Function

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

nvoPressSet

Type: SNVT_press_p, unit: Pa

Equipment functions: RR with RMF, TAM with RMF

Function

- Output of the differential pressure setpoint value within the EASYLAB system

nvoDampPos

Type: SNVT_switch

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

Function

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

nvoLocalAlarm

Type: SNVT_switch

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

nvoSummaryAlarm

Type: SNVT_switch

Equipment functions: RR with RMF, TAM 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

nvoPressAlarm

Type: SNVT_switch

Equipment functions: RR with RMF, TAM 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

nvoSystemDevices

Type: SNVT_count

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

from firmware version EM-LON 2.0 and TCU3, TAM 3.0

Function

- Number of identified EASYLAB system components

nvoStateDIO

Type: SNVT_state

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

from firmware version EM-LON 2.0 and TCU3, TAM 3.0

Function

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

nvoSC_LockHP

Type: SNVT_switch

Function

- Feedback, sash has been locked, high priority

nvoSC_GetPos

Type: SNVT_switch

Function

- Sash status (open/closed)

nvoSC_Alarm

Type: SNVT_switch

Function

- 'Automatic sash device not ready' signal

nvoDO_SetByLocal

Type: SNVT_state

Equipment functions: FH, EC/SC, RR, TAM, RR with RMF, TAM with RMF
from firmware version EM-LON 3.0 and TCU3, TAM 4.0

Function

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

nvoVoltageAI2

Type: SNVT_volt, unit V

Equipment functions: FH, EC/SC, RR, TAM, RR with RMF, TAM with RMF
from firmware version EM-LON 4.0 and TCU3, TAM 7.0

Function

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

nvoVoltageAI3

Type: SNVT_volt, unit V

Equipment functions: FH, EC/SC, RR, TAM, RR with RMF, TAM with RMF
from firmware version EM-LON 4.0 and TCU3, TAM 7.0

Function

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

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

nvoDampPosMax_ (State)**

0 All damper blades in standard operating mode. Intervention is possible.

-1 All damper blades in OPEN mode (special operating mode, value = 100 %). Intervention is possible.

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

nvoDampPosMin_ (State)**

0 All damper blades in standard operating mode. Intervention 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 functions: FH, EC/SC, RR, TAM, RR with RMF, TAM with RMF

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

nvoDampPosMin_FH

Type: SNVT_switch

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

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

nvoDampPosMax_RE

Type: SNVT_switch

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

nvoDampPosMin_RE

Type: SNVT_switch

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

nvoDampPosMax_TE

Type: SNVT_switch

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

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

nvoDampPosMin_TE

Type: SNVT_switch

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

nvoDampPosMax_RS

Type: SNVT_switch

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

Function

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

nvoDampPosMin_RS

Type: SNVT_switch

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

Function

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

nvoDampPosMax_EC

Type: SNVT_switch

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

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

nvoDampPosMin_EC

Type: SNVT_switch

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

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

nvoDampPosMax_SC

Type: SNVT_switch

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

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

nvoDampPosMin_SC

Type: SNVT_switch

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

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

nvoDampPosMax_TS

Type: SNVT_switch

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

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

nvoDampPosMin_TS

Type: SNVT_switch

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

from firmware version EM-LON 3.0 and TCU3, TAM 5.0

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

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 mode	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 mode	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 mode	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 mode	0	1	0	0
OPEN position	1	0	0	0

Default values for nviManOverride

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

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 mode
0xFF	OC_NUL	No default

Default values for nviMode

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

Default settings for nviManOp_Disable

Value	State	Function
-	0	- Manual control has been enabled on the control panel - Operating mode defaults set on DI override LON
-	1	- Manual control has been disabled on the control panel - Operating mode default settings from LON have the highest priority

Default settings for nviVolOffset_T

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

Default settings for nviVolOffset_P

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

Default settings for nviPressSetSel

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

Default settings for nviSunblinder

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

Default values for nviDO_Set

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

0 inactive

1 active

nvoManOverride functional values

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

nvoManOverride_R functional values

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

nvoMode functional values

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

nvoMode_R functional values

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

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 mode

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 mode

nvoSwitchPos functional values

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

nvoLocalAlarm functional values

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

nvoSummaryAlarm functional values

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

nvoPressAlarm functional values

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

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

Default values for nvoDO_SetByLocal

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

0 inactive

1 active

nvoDampPosMax_FH functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_FH functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_RE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_RE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_TE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_TE functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_RS functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_RS functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_EC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_EC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_SC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_SC functional values

Value	State
Damper blade position	Additional information

nvoDampPosMax_TS functional values

Value	State
Damper blade position	Additional information

nvoDampPosMin_TS functional values

Value	State
Damper blade position	Additional information

Installation details ▼

Installation and commissioning

Installation

- As attachment for the EASYLAB base component: factory mounted
- For retrofitting: Mount the expansion module into the base casing
- Connect to the LonWorks network

Commissioning

- The EASYLAB controller identifies the expansion module automatically
- Integrate system with the LonWorks network and link the data points logically (binding) using a network management tool (e.g. Echelon LonMarker, to be provided by others)
- Load EASYLAB LonWorks application
- Applications are available for download from our website

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