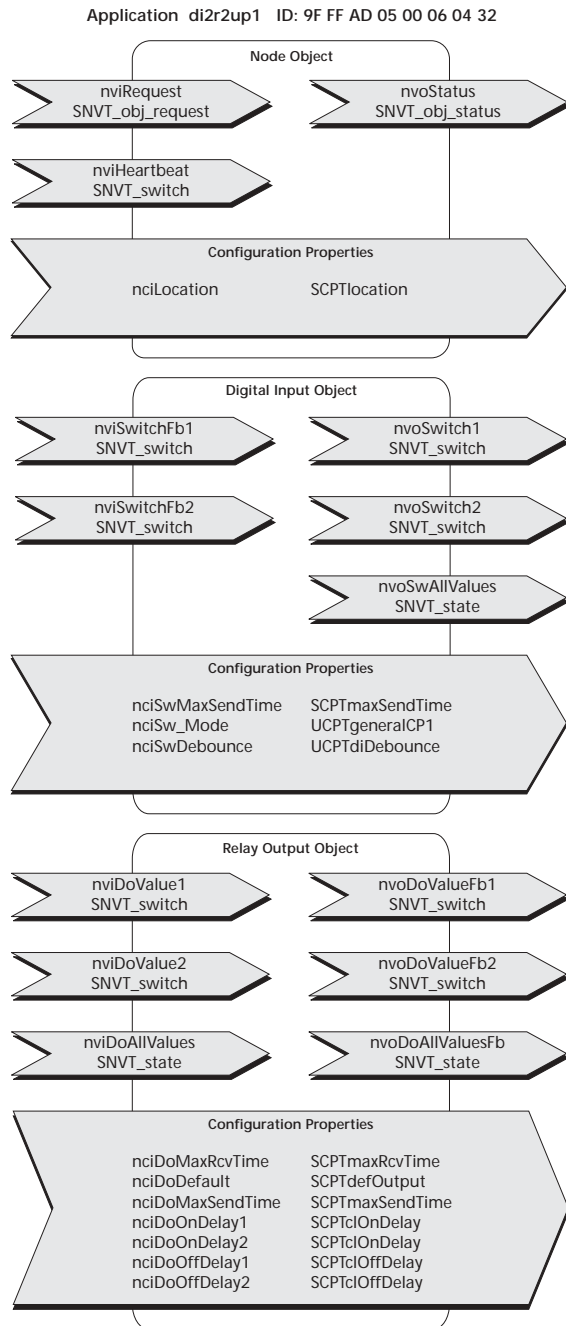


Software Application di2r2up1 (Standard I/O)

For Input-/Output Module Model DI2R2 UP LON



Standard application for status inquiry of digital inputs, control of relays outputs and data output. Application uses standard network variables (SNVT) and standard configuration parameters (SCPT) according to the LonMark® prescriptions. For extended adjustment possibilities, the application uses user-defined configuration parameters (UCPT). The UCPTs used here, are defined in the *Thermokon Device Resource Files* version 1.3 or higher.

Node Object (Node Object 0):

The Node Object monitors and controls the functions of the individual objects in the device. The basic functions required by LonMark® are supported. In addition, the sending of all output variables can be arranged by nviHeartbeat.

Digital Input Object (Switch Object 3200):

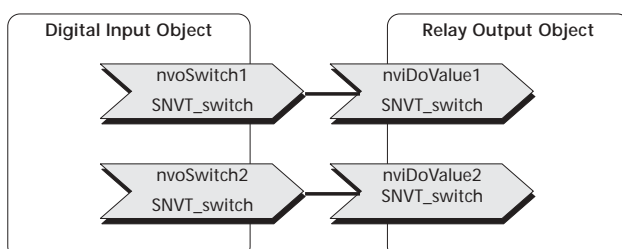
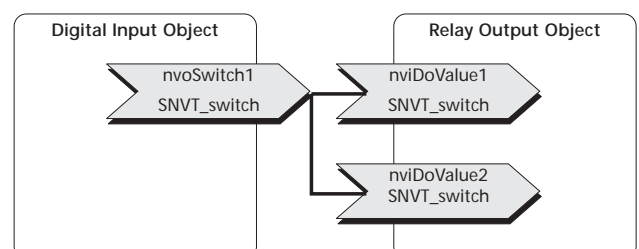
Status detection and interpretation of digital inputs with configurable function for light control. The status of the digital inputs are individually output by nvoSwitch1/2 and commonly by nvoSwAllValues. The digital inputs are configurable as open-/ closed contacts as well as button or switch.

Upon configuration as switch, the switch status open/closed are output. When configured as button, the output variable is switched with any button actuation, respectively the feedback value is inverted when using the feedback variables nviSwitchFb1/2.

Relay Output Object (Closed Loop Actuator Object 4):

The switch commands of the relays are prescribed via nviDoValue1 respectively nviDoValue2 or they are commonly prescribed via nviDoAllValues. Unless an update of the input variables is made within the monitoring time nciDoMaxRcvTime, the relays are turned on or off, according to the values of nciDoDefault.

After receipt of a new control command, the control of the relays is made time delayed. The switch delay can be individually adjusted for each relay via the configuration parameter On/OffDelay.

Bindings with direct control of the relays outputs via digital inputs:**a) DI1 controls R01 and DI2 controls R02****b) DI1 controls R01 and R02**

Node Object

The Node Object monitors and controls the functions of the individual objects in the device. The basic functions required by LonMark[®] are supported.

Network Variables Node Object:

nviRequest

SNVT Type: SNVT_obj_request, Index 92

Function: Input variable with the functions RQ_NORMAL, RQ_UPDATE_STATUS and RQ_REPORT_MASK.

nvoStatus

SNVT Type: SNVT_obj_status, Index 93

Function: Output variable with the required status Bits „invalid_id“ and „invalid_request“.

nviHeartbeat

SNVT Type: SNVT_switch, Index 95

Function: If the input variable is set (100.1 1), all output variables of the device are sent after a calculated time $([Node\ number\ 1...127] \times 100\ ms)$.

Configuration Parameter Node Object:

nciLocation

SCPT Type: SCPTlocation, Index 17, SNVT_str_asc

Function: Additional input possibility for storing information for location identification

Digital Input Object

The Object contains the function status detection of the digital inputs and data outputs.

Network Variables Digital Input Object:

nviSwitchFb1, nviSwitchFb2

SNVT Type: SNVT_switch, Index 95

Function: Input variables for current status of the light groups controlled by nvoSwitch1 respectively nvoSwitch2. The values of the input variables are used, if the digital inputs are configured for button with toggle-function.

nvoSwitch1, nvoSwitch2

SNVT Type: SNVT_switch, Index 95

Function: Output variables with the status of the digital inputs. The output variables are output after change of input status, after expiration of heartbeat time (nciSwMaxSendTime) and after module reset. Calculated time for output after module reset: $1s + ([Nodenummer\ 1...127] \times 100ms)$

By **nciSw_Mode**, the functions of the inputs are configurable as **open** or **closed contact** as well as **button** or **switch**.

Potential-free contact active ==> nvoSwitch[1...2] = 100.0 1

Potential-free contact not active ==> nvoSwitch[1...2] = 0.0 0

nvoSwAllValues

SNVT Type: SNVT_state, Index 83

Function: Output variable with status of all digital inputs in one collective network variable.

bit0 = DI1, bit1 = DI2

Interpretation and data output is made analog to nvoSwitch1/2.

Potential-free contact active ==> nvoSwAllValues.bit[0...1] = 1

Potential-free contact not active ==> nvoSwAllValues.bit[0...1] = 0

Configuration Parameter Digital Input Object:**nciSwDebounce**

UCPT Type: UCPTdiDebounce, Index 38, SNVT_count

Function: Configuration parameter for debounce time (in ms). (Preset value: 50 ms)

nciSw_Mode

UCPT Type: UCPTgeneralCP1, Index 7, SNVT_state

Function: Parameter for configuration of potential-free digital inputs.

	DI1		DI2	
	bit 0	bit 1	bit 2	bit 3
Schalter	0	*	0	*
Taster	1	*	1	*
Schliesser	*	0	*	0
Öffner	*	1	*	1

nciSwMaxSendTime

SCPT Type: SCPTmaxSendTime, Index 49, SNVT_time_sec

Function: After expiration of time nciSwMaxSendTime (Heartbeat interval) the digital inputs are inquired and the output variables nvoSwitch[1...2] and nvoSwAllValues are sent. By means of the input values < 1 sec the heartbeat function is deactivated. (Preset value: 0)

Relais Output Object

The object contains the function relais control and data output.

Network Variables Relais Output Object:**nviDoValue1, nviDoValue2**

SNVT Type: SNVT_switch, Index 95

Function: Input variables with the control commands for the relais (100.0 1 = ON, 0.0 0 = OFF). After receipt of a new control command, the control of the relais is made time delayed. The switch delay can be individually adjusted for each relais via the configuration parameter **nciDoOnDelay[1...2]** and **nciDoOffDelay[1...2]**.**nviDoAllValues**

SNVT Type: SNVT_state, Index 83

Function: Input variable with the switch commands for all relais: bit0 = R01, bit1 = R02

nvoDiAllValues.bit[0...1] = 0 ==> Relais = OFF

nvoDiAllValues.bit[0...1] = 1 ==> Relais = ON

The variables nviDoValue and nviDoAllValues are treated equivalent. The last update determines the status of the relais.

nvoDoValueFb1, nvoDoValueFb2

SNVT Type: SNVT_switch, Index 95

Function: Feedback variables for the switch status of the relais (100.0 1 = ON, 0.0 0 = OFF). They are output after change of the relais status, after expiration of heartbeat time (nciDoMaxSendTime) and after module reset. Calculated time for output after module reset: 1s+([Nodenummer 1....127] x 100ms)

nvoDoAllValuesFb

SNVT Type: SNVT_state, Index 83

Function: Feedback variables for the switch status of all relais in a collective network variable. Data transmission is made analog to nvoDoValueFb. The load of the single bits is made just as with nviDoAllValues.

Configuration Parameter Relais Output Object:

nciDoDefault

SCPT Type: SCPTdefOutput, Index 7, SNVT_state

Function: Initialization switch status of relais after module reset or after expiration of time nciDoMaxRcvTime. The load of the individual bits is made just as with nviDoAllValues. (Preset value: 0, i.e. Relais OFF)

nciDoMaxRcvTime

SCPT Type: SCPTmaxRcvTime, Index 48, SNVT_time_sec

Function: Monitoring time, in which the input variables with the switch commands for the relais have to be updated. Unless the update is made right in time, the relais take over the respective value from nciDoDefault. By means of the input values < 1 sec. the LON monitoring function is deactivated. A nv-update to one of the input variables nviDoValue1/2 or nviDoAllValues re-starts the monitoring timer. Preset value: 0 (Timeout function deactivated).

nciDoMaxSendTime

SCPT Type: SCPTmaxSendTime, Index 49, SNVT_time_sec

Function: After expiration of time nciDoMaxSendTime (Heartbeat interval) the switch status of the relais are inquired and the output variables nvoDoValueFb[1...2] and nvoDoAllValuesFb are sent. By means of the input values < 1 sec. the heartbeat function is deactivated. (Preset value: 0).

nciDoOnDelay1, nciDoOnDelay2

SCPT Type: SCPTclOnDelay, Index 86, SNVT_time_sec

Function: Configuration parameter for switch-on delay of relais outputs. With any change of the input variables from OFF to ON, the switch-on delay is restarted. (Preset value: 0).

nciDoOffDelay1, nciDoOffDelay2

SCPT Type: SCPTclOffDelay, Index 85, SNVT_time_sec

Function: Configuration parameter for switch-off delay of relais outputs. With any change of the input variables from ON to OFF, the switch-on delay is restarted. (Preset value: 0)

General Remarks:

Wink - Event

Service LED is triggered and blinking two times.

Configuration Parameter

A download of the application overwrites the adjusted configuration parameters of the manufacturer. The configuration parameters are designed as configuration network variables and are thereby also available as bindable network variables with virtual functional block (from LNS 3.0). Thus parameter changes are possible even without installation tool.

!!An update of the variables is directly written into the non-volatile memory of hardware. User has to make sure !!that the total number of writing cycles does not exceed maximum capacity of non-volatile memory (< 10000).