



## SALMSON-Control IF-Modul LON / IF-Modul Sirius LON

**GB** Installation and operating instructions

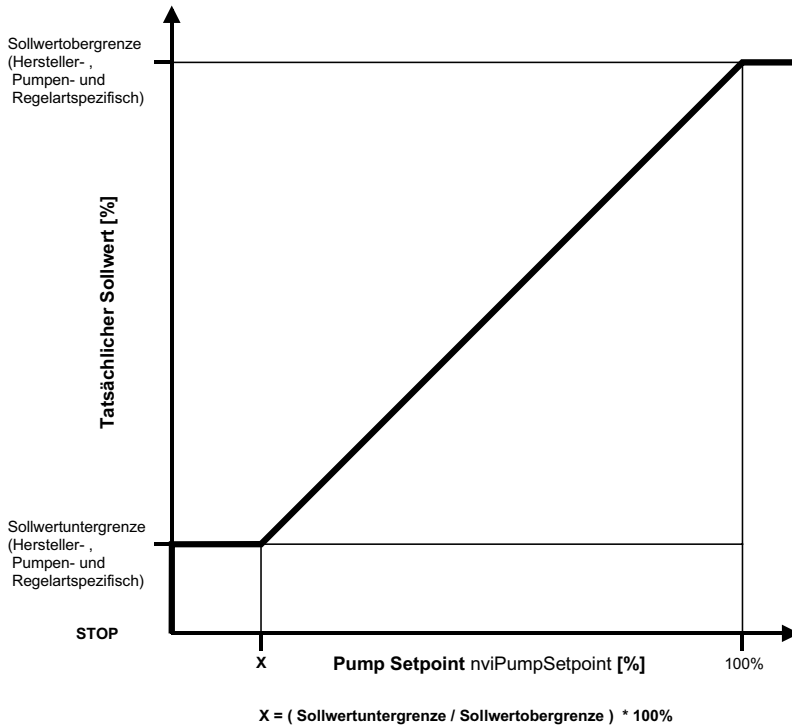
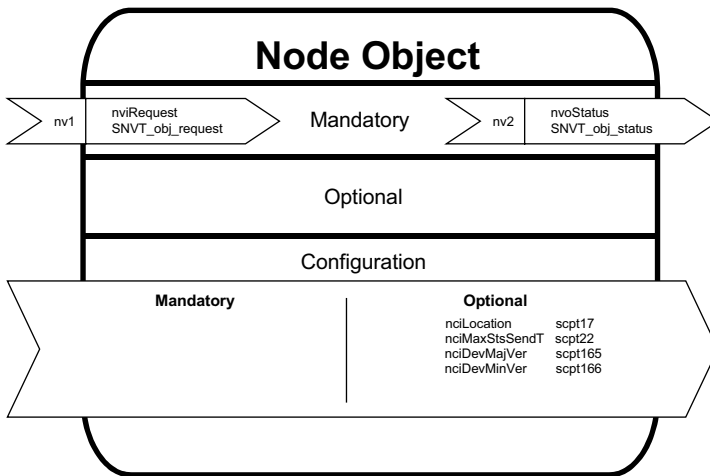


Fig.1b:

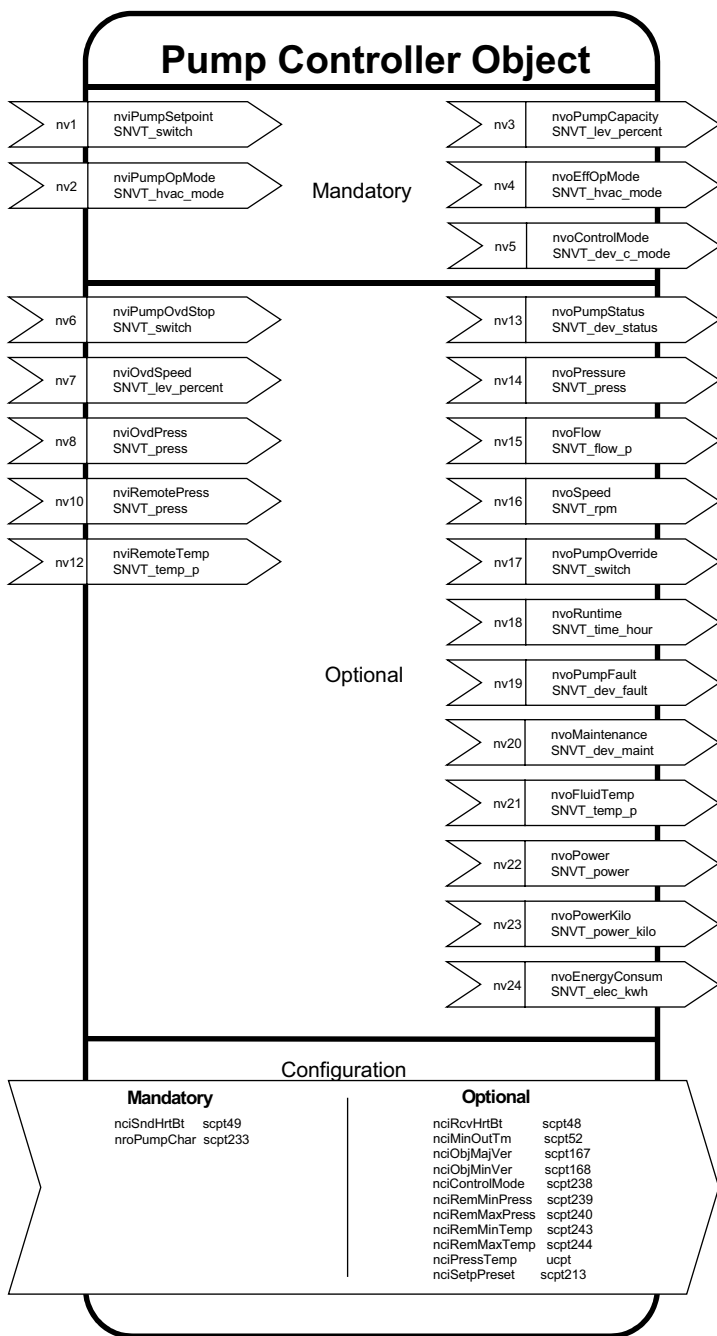


Fig.3a:

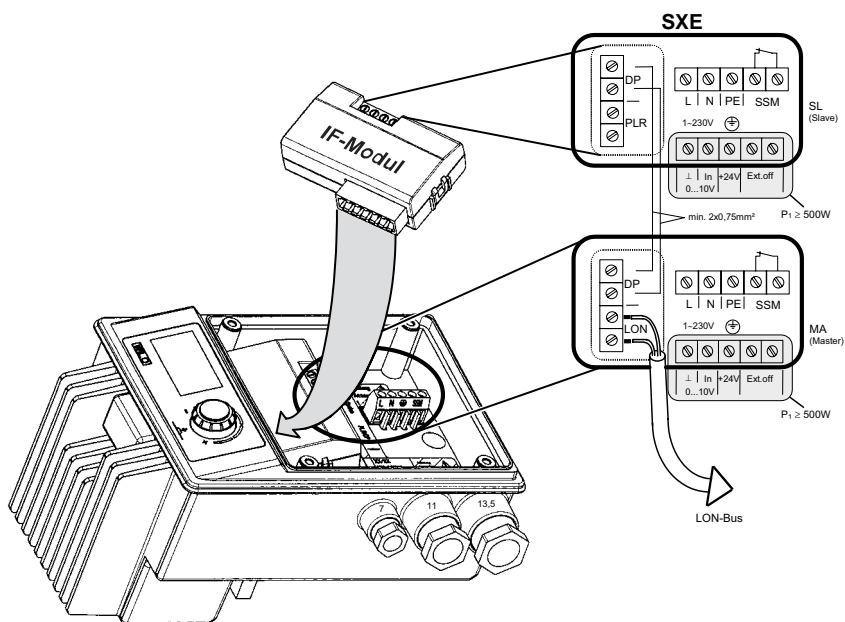


Fig.3b:

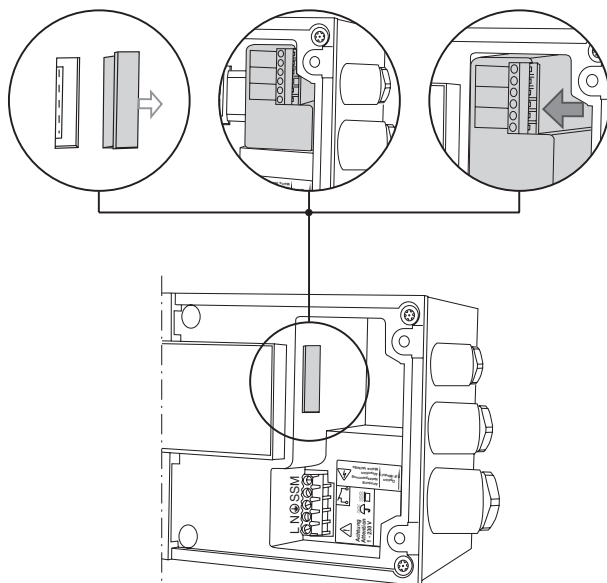


Fig.3c:

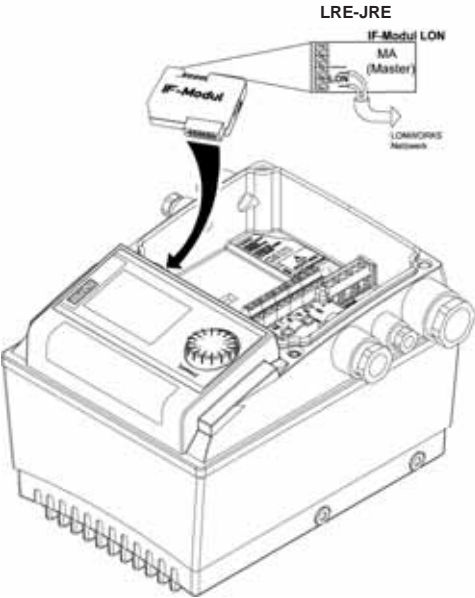


Fig.3d:

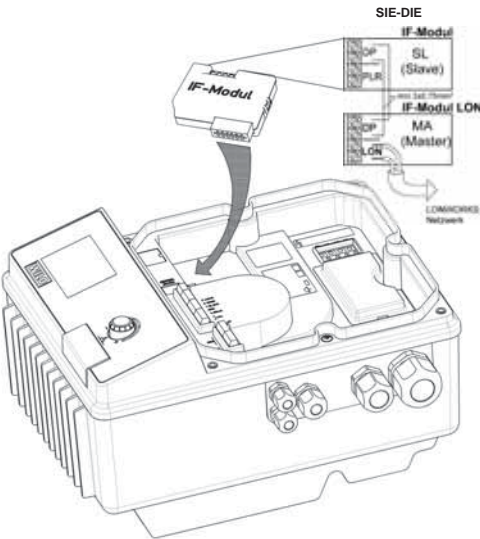


Fig.4:

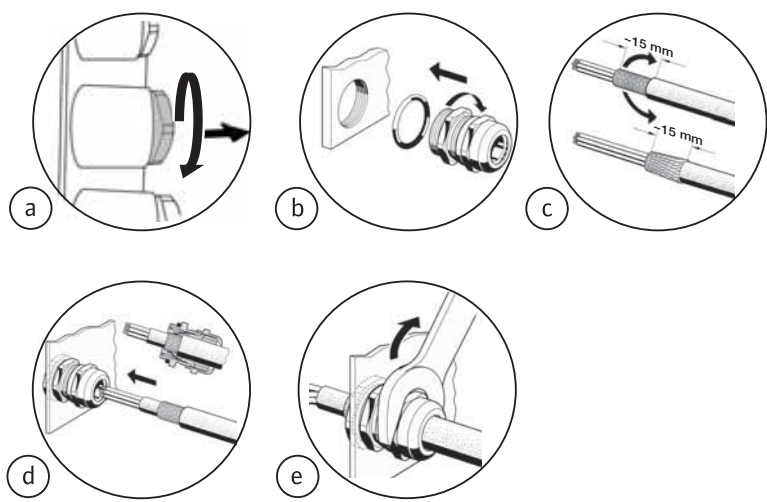


Fig.5:

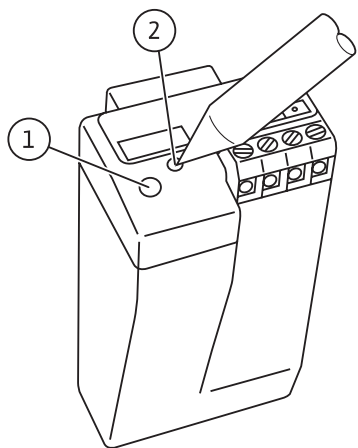
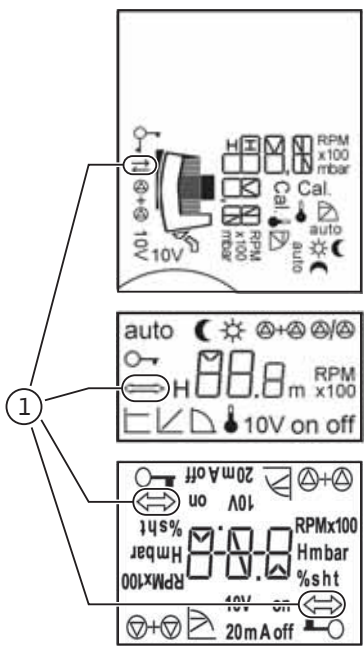


Fig.6:





## 1 General

### 1.1 About this document

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

These installation and operating instructions correspond to the relevant version of the product and the underlying safety standards valid at the time of going to print.

**These Installation and operating instructions are intended as supplement to the Installation and operating instructions for the pumps connected to the LON bus.**

## 2 Safety

These instructions contain important information which must be followed when installing and operating the pump. These operating instructions must therefore be read before assembly and commissioning by the installer and the responsible operator.

### 2.1 Indication of instructions in the Operating Instructions

**Symbols:**

**General danger symbol**



**Danger due to electrical voltage**



**NOTE: ...**



**Signal words:**

**DANGER!**

**Acutely dangerous situation.**

**Non-observance will result in death or serious injuries.**

**WARNING!**

**The user may suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is likely if this information is disregarded.**

**CAUTION!**

**There is a risk of damaging the pump/unit. 'Caution' implies that damage to the product is possible if this information is disregarded.**



NOTE: Useful information on using the product. It also draws attention to potential problems.

## 2.2 Safety instructions for inspection and installation work

The safety instructions in the installation and operating instructions for the entire unit should be observed for all work on the pump(s).



**WARNING! Danger from electric shock**

Any hazards from electrical current should be ruled out.

Work on the unit/pump(s) may only be carried at a mechanical standstill, in electrically isolated condition and with appropriate tools.

## 3 Transport and interim storage

Inspect the pump/system for transport damage immediately upon arrival. Any transport damage found must be reported to the carrier within the prescribed periods.



**CAUTION! Risk of damage to the IF-module!**

Risk of damage due to improper handling during transport and storage.

- The IF-modules should be protected against humidity, frost and mechanical damage during transport and temporary storage.
- They must not be exposed to temperatures outside the range of - 10 °C to + 70 °C.

## 4 Intended use

### IF-module LON, IF-module Sirius LON

The IF-module LON is used to connect electronically controlled glandless or glanded pumps to a LON. The pump can be preset with setpoints, operating modes and data from external sensors, and current operating data and fault signals can be transferred from the pump via the LON bus.

At the same time the IF-module LON allows two pumps to be connected to form a double pump via an additional DP interface. This interface is a separate device. It is not a LON-based interface. That is why the LON bus for the double pump interface is not put under strain and the slave pump can be equipped with an inexpensive IF-module PLR.

Connectable pump types

Glandless pumps	Glanded pumps
<ul style="list-style-type: none"><li>•SXE with IF -module LON</li><li>•DXE with IF -module LON and IF -module PLR</li><li>•Siriox with IF -module Siriox LON</li><li>•Siriox -D with IF -module Siriox LON and IF -module Siriox PLR</li><li>•</li><li>•</li></ul>	<ul style="list-style-type: none"><li>•LREwith IF -module LON</li><li>•JREwith IF -module LON</li><li>•SIE with IF -module LON</li><li>•DIE with IF -module LON and IF -module PLR</li></ul>

Table 4.1

5 Product information

5.1 Type key

Exemple: Salmson IF -module LON		
Control	Series designation	
	Type designation:	IF -module LON IF -module Siriox LON

5.2 Technical specifications	
Processor:	TMPN3150B1AF or CY7C53150
Memory:	32 KB flash
Transceiver:	FTT 10A
Clock:	10 MHz
Firmware:	Version 7
Power supply:	5 V= and 15 V= via the pump
Current input:	Approx. 30 mA
Ambient temperature:	0 °C – 40 °C
Bus cable:	JY(St) Y 2 x 2 x 0.8
Max. bus cable length:	<ul style="list-style-type: none"><li>• 900 m with bus topology with max. 3 m stub length</li><li>• 450 m with free topology, with max. 250 m between 2 inter-communicating nodes</li></ul>
Program ID (software):	9F:FF:CC:51:14:06:04:04

### 5.3 Standards

The IF-module LON complies with the following standards:

- LonMark Application Layer Interoperability Guidelines version 3.2
- LonMark Layers 1–6 Interoperability Guidelines version 3.2
- LonMark node object 0000\_20
- LonMark pump controller object 8120\_10
- LonMark Resource Files version 13.00

The entire documentation can be found at [www.wilo.de](http://www.wilo.de) (– Produkte (Products), – Salmson Schaltgeräte (Salmson switching devices), – LonMark Functional Profile ...).

### 5.4 Scope of delivery

- IF-module LON or IF-module Sirius LON
- PG 7 metallic cable connection
- PG 9 metallic cable connection
- Installation and operating instructions

#### 5.4.1 Delivery condition

According to the LonMark Application Layer Interoperability Guidelines, the IF-module LON is delivered in “application unconfigured” condition.

In this condition, the IF-module LON can be addressed via the LON bus, but the application which normally establishes the communication with the pump is not yet in operation. There is therefore no activity yet after connecting the IF-module LON and switching on the power supply of the pump.

## 6 Description and function

### 6.1 Description of the objects

Two objects, the node object and pump object, are implemented in the IF-module LON. The node object is used to control individual objects within the node; errors which occur in the individual objects are also indicated centrally here.

Fig. 1a shows the node object with the corresponding network variables, Fig. 1b shows the pump controller object with the corresponding network variables.

NOTE:

- Double pumps should always be equipped with the integrated double pump management.
- At double pumps, the IF-module LON is connected to the master.
- If the integrated double pump management is not used for double pumps, the two drives should be treated as two separate individual pumps. In this case, two LON IF modules are necessary.
- The control functions apply to the double pump as entire unit.



6.2 Description of the network variables

6.2.1 Value ranges and resolutions of the input network variables

Input network variable	Mand. / opt.	INVT	Object	No.	Receive heartbeat	Data range and units	Resolution	Default value	Invalid data	Data range and effective resolution
nviRequest	M		0	1	no	-	-	-	-	.object_id: 0 – 1 .object_request: RQ_NORMAL RQ_DISABLED RQ_ENABLE RQ_UPDATE_STATUS RQ_REPORT_MASK RQ_CLEAR_STATUS
nviPumpSetpoint	M		1	1	no	.state: 0 – 1 .value: 0.0 – 100.0%	-	SCP1setpoint	-	.state: 0 – 1 .value: 0.0 – 100.0%
nviPumpOpMode	M		1	2	no	enum 0 ... 17 (hvac_t)	-	HVAC_AUTO	0xFF (HVAC_NUL)	HVAC_AUTO HVAC_MRNG_WRMUP HVAC_PRE_COOL HVAC_ECONOMY
nviPumpOvdStop	O		1	6	no	.state: 0 – 1 .value: 0.0 ... + 100.0%	-	.state: 0xFF .value: 0xFF	.state: 0xFF	.state: 0 – 1 .value: 0.0 – 100.0%
nviOvdSpeed	O		1	7	no	-163.84 ... +163.83 %	0.005 %	0x7FFF	0x7FFF	0 – 100% Eff. resolution: 0.5%
nviOvdPress	O		1	8	no	-3276.8 ... +3276.6 kPa	0.1 kPa	0x7FFF	0x7FFF	Range depends on pump type. Eff. resol.: 0.981 kPa
nviRemotePress	O		1	10	yes	-3276.8 ... +3276.6 kPa	0.1 kPa	0x7FFF	0x7FFF	0 – 3276.6 kPa
nviRemoteTemp	O		1	12	yes	-273.17 ... +327.66 °C	0.01 °C	0x7FFF	0x7FFF	Eff. resol.: 0.981 kPa -273.1 – 327.6 °C Eff. resol.: 0.1 °C

Table 6.2.1

## 6.2.2 Value ranges and resolutions of the output network variables

Output network variable	Mand. / opt.	NVT	Obj	No.	Send heartbeat / Ack	Min. send time	Data range and units	Resolution	Invalid data	Range and effective resolution	Send when value changes more than
nvoStatus	M	SNVT_obj_status	0	2	yes	yes			-	invalid_id invalid_request disabled_fault unable_to_measure manual_control in_alarm	Send upon nvRequest: update
nvoPumpCapacity	M	SNVT_lev_percent	1	3	yes	yes	-163.84 – 163.83 %	0.005 %	0x7FFF	0 – 100.0% Res: 0.2%	5 % of nroPumpChar.pressMax or 2 % of nroPumpChar.speedMax resp.: control mode changes
nvoPressure	O	SNVT_press	1	14	no	yes	-3276.8 – 3276.6 kPa	0.1 kPa	0x7FFF	Range depends on pump type Res.: 0.981 kPa	5 % of nroPumpChar.pressMax
nvoFlow	O	SNVT_flow_p	1	15	no	yes	0 – 655.34 m³/h	0.01 m³/h	0x7FFF	Range depends on pump type Res.: 0.1 m³/h	5 % of nroPumpChar.flowMax
nvoEnergyConsum	O	SNVT_elec_kWh	1	24	no	yes	0 – 65535 kWh	1 kWh	-	0 – 65535 kWh Res.: 1 kWh	1 kWh
nvoPower	O	SNVT_power	1	22	no	yes	0 – 6553.5 W	0.1 W	-	0 – 6553 W Res.: min. 1 W	10 % of max. power
nvoPowerKilo	O	SNVT_power_kilo	1	23	no	yes	0 – 6553.5 kW	0.1 kW	-	0 – 65.5 kW Res.: 0.1 kW	10 % of max. power
nvoRuntime	O	SNVT_time_hour	1	18	no	yes	0 – 65535 h	1 h	-	0 – 65535 h Res.: 10 h	10 h
nvoSpeed	O	SNVT_rpm	1	16	no	yes	0 – 65535 rpm	1 rpm	-	0 – 65535 rpm Res.: min. 1 rpm	2 % of nroPumpChar.speedMax
nvoFluidTemp	O	SNVT_temp_p	1	21	no	yes	-273.17 – 327.66 °C	0.01 °C	0x7FFF	-50 °C – 205 °C Res.: min. 0.1 °C	5 °C
nvoControlMode	M	SNVT_dev_c_mode	1	5	yes	yes	ENUM 0 – 29 (device_c_mode__t)	-	0xFF	DCM_SPEED_CONST DCM_PRESS_CONST DCM_PRESS_COMP DCM_PRESS_AUTO DCM_NUL	Immediately

Table 6.2.2

Mand. / opt.	INVT	Obj	No.	Send heartbeat / Ack	Min. send time	Data range and units	Resolution	Invalid data	Range and effective resolution	Send when value changes more than
O	SNVT_dev_maint	1	20	no	yes	Bit set	-	-	service_required	Immediately
O	SNVT_dev_fault	1	19	no	yes	Bit set	-	-	sf_voltage_low sf_voltage_high sf_phase sf_no_fluid df_motor_temp df_motor_failure df_pump_blocked df_elect_temp df_elect_failure_nf df_elect_failure df_sensor_failure	Immediately
O	SNVT_dev_status	1	13	yes	yes	Bit set	-	-	device_fault supply_fault speed_low speed_high setpt_out_of_range local_control running remote_press remote_temp	Immediately
M	SNVT_hvac_mode	1	4	yes	yes	ENUM 0 – 17 (hvac_t)	-	0xFF	HVAC_AUTO HVAC_MRNG_WRMUP HVAC_PRE_COOL HVAC_ECONOMY HVAC_NUL	Immediately
O	SNVT_switch	1	17	no	yes	.state: 0 – 1 .value: 0.0–100.0%	-	.state: 0xFF	.state: 0 – 1 .value: 0.0%, 100.0%, 0xFF	Immediately

Table 6.2.2, continuation

Output network variable
nvoMaintenance
nvoPumpFault
nvoPumpStatus
nvoEffQpMode
nvoPumpOverride

Table 6.2.2, continuation

### 6.2.3 Value ranges and resolutions of the configuration input network variables

Input configuration variable	Mandatory / optional / user	CPT / NVT	Object	Number	Data range and effective resolution
nciMaxStsSendT	O	SCPTmaxSndT	0	22	0—0d17h59m59s Eff. res: 1 s
nciLocation	O	SCPTlocation	0	17	-
nciRcvHrtBt	O	SCPTmaxRcvTime	1	48	0—6553 s Eff. res: 1 s
nciSndHrtBt	M	SCPTmaxSendTime	1	49	0—6553s Eff. res: 1 s
nciMinOutTm	O	SCPTminSendTime	1	52	0—6553 s Eff. res: 1 s
nciControlMode	O	SCPTdeviceControlMode	1	238	DCM_SPEED_CONST DCM_PRESS_CONST DCM_PRESS_COMP DCM_PRESS_AUTO
nciRemMinPress	O	SCPTminRemotePressureSetpoint	1	239	0—32767 kPa Eff. res: 0.981 kPa
nciRemMaxPress	O	SCPTmaxRemotePressureSetpoint	1	240	0—32767 kPa Eff. res: 0.981 kPa
nciRemMinTemp	O	SCPTminRemoteTempSetpoint	1	243	-273.1—327.6 °C Eff. res: 0.1 °C
nciRemMaxTemp	O	SCPTmaxRemoteTempSetpoint	1	244	-273.1—327.6 °C Eff. res: 0.1 °C
nciPressTemp	U	UCPTPressTemp	1		.TempMin, .TempMax: 0—110 °C Eff. res: 0.1 °C .PressMin, .PressMax: 0—32767 kPa Eff. res: 0.981 kPa
nciSetpPreset	O	SCPTsetpoint	1	213	.state: 0—1 .value: 0—255

Table 6.2.3

6.2.4 Value ranges and resolutions of the configuration output network variables

Output configuration variable	Mandat./ optional	CPT / NVT	Object	Number	Value
nciDevMajVer	O	SCPTdevMajVer	0	165	02
nciDevMinVer	O	SCPTdevMinVer	0	166	00
nroPumpChar	M	SCPTpumpCharacteristic	1	233	Depends on pump type
nciObjMajVer	O	SCPTobjMajVer	1	167	02
nciObjMinVer	O	SCPTobjMinVer	1	168	00

6.2.5 Description of the network variables

Object request

network input SNVT\_obj\_request nviRequest

This input network variable triggers various operations concerning the node and object status. It consists of 2 bytes, the ID byte and the value byte. The ID byte indicates the number of the object to which the request applies. The ID value 0 refers to the node object; in this case requests may also affect all other objects. The ID value 1 refers to the pump-controller object.

Value range

Value	Function with ID = 0	Function with ID = 1
RQ_NORMAL	Normal operation of all objects	Normal operation of pump controller
RQ_DISABLED	Stops all objects	Stops the pump controller
RQ_ENABLE	Enables the node object	Enables the pump controller
RQ_UPDATE_STATUS	Updates the node object status (OR operation for all objects)	Updates the pump controller status
RQ_REPORT_MASK	Supported node object status signals (OR operation for all objects)	Supported pump controller status signals
RQ_CLEAR_STATUS	Deletes certain status signals in all objects	Deletes certain pump controller status signals



**Object status**

network output SNVT\_obj\_status nvoStatus

This output network variable provides status information on the individual objects. The information is bit-coded. All bits are deleted after a reset.

Value range

Bit	Function
invalid_id	A non-existent object was addressed.
invalid_request	An unknown request was sent.
disabled	The object in concern is switched off.
electrical_fault	The pump controller object indicates an electrical error.
unable_to_measure	The pump controller object cannot communicate with the pump.
comm_failure	For the node object only
manual_control	The pump controller object is disabled for controlling by the hardware settings at the pump (ext. off, ext. min, IR monitor)
in_alarm	The pump controller object indicates an error.
report_mask	Indicates that nvoStatus contains the status mask, i.e. the list of all supported bits, due to a preceding RQ_REPORT_MASK request.

**Maximum status send time**

network input config SNVT\_elapsed\_tm nciMaxStsSendT

This optional input configuration network variable defines a clock at which the object statuses are automatically sent. The status of the node object and pump-controller object are sent alternately.

Value range

0d0h0m0s0ms – 0d17h59m59s999ms (in 1 s steps). The value 0d0h0m0s0ms switches off automatic sending.

Default value: 0d0h0m0s0ms (automatic sending switched off)

SCPT reference: SCPTmaxSendT (22)

**Device major version**

network output config unsigned short nciDevMajVer

This optional output configuration network variable provides the high byte of the module version.

SCPT reference: SCPTdevMajVer (165)

**Device minor version**

network output config unsigned short nciDevMinVer

This optional output configuration network variable provides the low byte of the module version.

SCPT reference: SCPTdevMinVer (166)

**Location label**

network input config SNVT\_str\_asc nciLocation

This optional input configuration network variable can be used to save information about the installation location of the pump which goes beyond the information string stored in the Neuron chip, which only consists of 6 Byte.

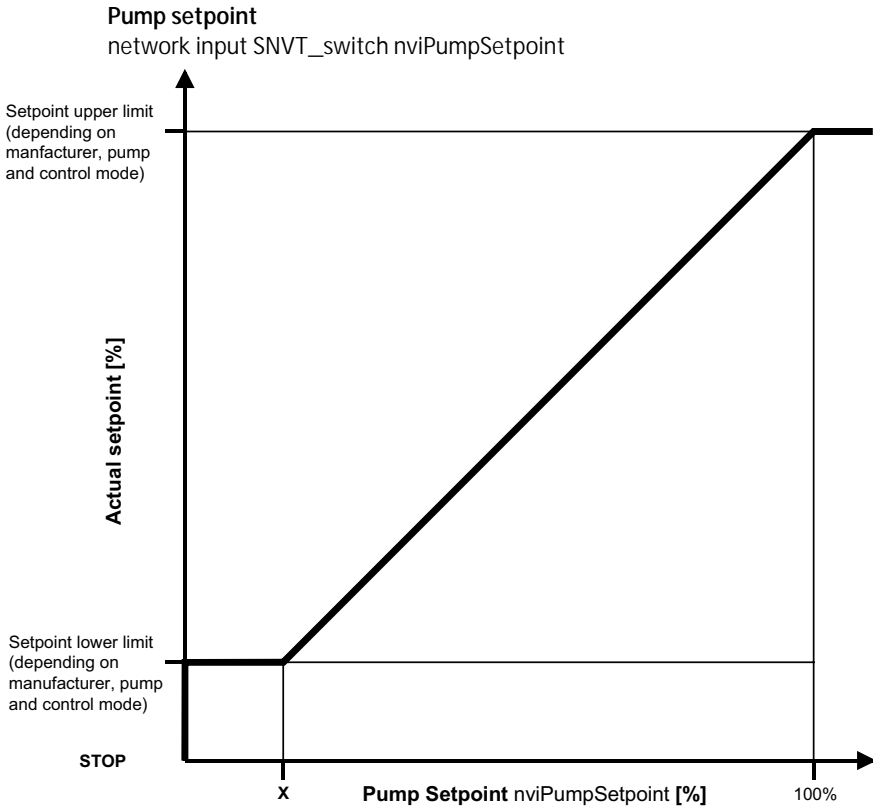
Value range

Optional NUL-terminated ASCII string of max. 31 bytes length (incl. NUL)

Default value

ASCII string which only consists of NUL (" ")

SCPT reference: SCPT\_location (17)



$$X = ( \text{Setpoint lower limit} / \text{setpoint upper limit} ) * 100\%$$

This input network variable is used to switch the pump on and off and specify a setpoint.

The network variable consists of a status byte in which the switch-on condition is transmitted and a value byte in which the setpoint is transmitted.

If a status byte of 0 is set, the pump is switched off. If a status byte of 1 is set, the switch-on condition depends on the value byte.

If a setpoint of 0% is preset, the pump is switched off. If a setpoint greater than 0% is preset, the pump is switched on if the status byte is 1. The setpoint can be changed in steps of 0.5%.

If setpoints greater than the upper setpoint limit value are set, they are reduced to the upper setpoint limit value. Accordingly setpoints below the lower setpoint limit value are raised to the lower setpoint limit value.

The upper and lower setpoint limit values may change if the pump is operated with an external sensor (see nviRemotePress, nciRemMinPress and nciRemMaxPress).

Value range

Status	Value	Function
0	0 – 255	STOP
1	0	STOP
1	1 – 200	0.5 – 100.0%
1	201 – 255	100.0%

Default value: status = 1, value = 200 = 100.0%. The default value corresponds to the setting which can be stored in the SCPTsetpoint configuration parameter in a non-volatile manner.

**Requested pump operating mode**

network input SNVT\_hvac\_mode nviPumpOpMode

This input network variable is used to set an operating mode. If an operating mode is set which is not defined or invalid, the pump remains in the current mode.

Value range

Value	Function	Comments
HVAC_AUTO	Normal operation	Setpoint via nviPumpSetpoint
HVAC_MRNG_WRMUP	Warm-up mode	Maximum speed
HVAC_PRE_COOL	Cooling mode	Maximum speed
HVAC_ECONOMY	Energy-saving mode	Setback operation speed (pump type specific)
HVAC_NUL	Invalid	

Default value: HVAC\_AUTO

**Pump Capacity**

network output SNVT\_lev\_percent nvoPumpCapacity

This output network variable provides the current operating point of the pump as percentage of the maximum setpoint.  
When using an external pressure or temperature sensor, this variable provides the sensor value as a percentage of the maximum sensor value.

**Value range**

-163.840% – 163.830% (in 0,02% steps). 163.835% is an invalid value.

**Transmission**

This value is transmitted automatically if it deviates from the value transmitted last by more than 5% of the value in `nroPumpChar.pressMax` (with differential pressure control) or 2% of the value in `nroPumpChar.speedMax` (with speed controller). Furthermore, this value is regularly transmitted if the `nciSndHrtBt` configuration input was described with a valid clock. This value is also transmitted if the control mode has been changed by overriding settings or the connection of an external sensor.

**Transmission frequency**

The minimum network variable transmission interval can be set by describing the `nciMinOutTm` configuration input with a valid clock.

Preset service type: acknowledged

**Effective operating mode**

network output `SNVT_hvac_mode` `nvoEffOpMode`

This output network variable provides the current operating mode of the pump.

This value corresponds to the setting in the `nviPumpOpMode` input network variable, provided a different operating mode has not been forced by local settings at the pump (ext. off, ext. min or IR monitor).

**Value range**

Value	Function	Comments
HVAC_AUTO	Normal operation	Setpoint via <code>nviPumpSetpoint</code>
HVAC_MRNG_WRMUP	Warm-up mode	Maximum speed
HVAC_PRE_COOL	Cooling mode	Maximum speed
HVAC_ECONOMY	Energy-saving mode	Setback operation speed (pump type specific)
HVAC_OFF	Offline mode	Ext. off or manual operation mode via IR monitor
HVAC_NUL	Invalid	

**Transmission**

This value is automatically transmitted whenever a change is made.

Furthermore, this value is transmitted regularly if the `nciSndHrtBt` configuration input was described with a valid clock.

**Transmission frequency**

The minimum network variable transmission interval can be set by describing the `nciMinOutTm` configuration input with a valid clock.

Preset service type: acknowledged

**Effective device control mode**

network output SNVT\_dev\_c\_mode nvoControlMode

This output network variable provides the current control mode of the pump.

Value range

Value	Function
DCM_SPEED_CONST	Constant speed mode
DCM_PRESS_CONST	Constant pressure mode
DCM_PRESS_COMP	Compensated pressure mode
DCM_PRESS_AUTO	Temperature-dependent differential pressure

Transmission

This value is automatically transmitted whenever a change is made.

Furthermore, this value is transmitted regularly if the nciSndHrtBt configuration input was described with a valid clock.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: acknowledged

**Pump override stop command**

network input SNVT\_switch nviPumpOvdStop

This optional input network variable provides an overriding switch-on/switch-off function and is intended for maintenance work, for example. The network variable consists of a status byte and a value byte.

The “OVDSTOP” setting has priority over the setpoint set in nviPumpSetpoint and the overriding setpoints set in nviOvdSpeed and nviOvdPress.

An overriding setting is indicated in the nvoPumpOverride output network variable.

Value range

Status	Value	Function
0	0 – 255	NORMAL
1	0	NORMAL
1	1 – 255	OVDSTOP
255	0 – 255	Invalid (NORMAL)

Default value: status = 255, value = 255

### **Override setpoint for speed**

network input SNVT\_lev\_percent nviOvdSpeed

This optional input network variable is used for the overriding setting of a speed setpoint, e.g. for maintenance work. The value is set as a percentage of the maximum value of the pump. If a valid range is received, the setpoint set via nviPumpSetpoint or nviOvdPress is overwritten and speed controller mode automatically set.

The pump is reset to normal condition by an invalid value in all overriding nviOvdSpeed and nviOvdPress setpoint settings and a “Normal” setting via nviPumpOvdStop.

An overriding setting is indicated in the nvoPumpOverride output network variable.

Value range

-163.84% – 163.83% (in 0.005% steps). 163.835% is an invalid value.

Values lower than 0% or higher than 100% are limited accordingly and nvoPumpStatus.pump\_ctrl.setpt\_out\_of\_range is set.

Default value: 163.835%

### **Override setpoint for pressure**

network input SNVT\_press nviOvdPress

This optional input network variable is used for the overriding setting of a differential pressure setpoint, e.g. for maintenance work. The value is set as a percentage of the maximum value of the pump. If a valid range is received, the setpoint set via nviPumpSetpoint or nviOvdSpeed is overwritten and the constant differential pressure control mode is automatically set.

The pump is reset to normal condition by an invalid value in all overriding nviOvdSpeed and nviOvdPress setpoint settings and a “Normal” setting via nviPumpOvdStop.

An overriding setting is indicated in the nvoPumpOverride output network variable.

Value range

-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Values outside the valid range for the respective pump are limited accordingly and nvoPumpStatus.pump\_ctrl.setpt\_out\_of\_range is set.

Default value: 3276.7 kPa

### **Remote pressure sensor input**

network input SNVT\_press nviRemotePress

This optional input network variable allows an external differential pressure sensor to be used to control the pump. If a valid value is received, the pump automatically switches to constant differential pressure control mode.

Control by means of an external sensor is indicated in the nvoPumpStatus.pump\_ctrl.remote\_press network variable.

The nvoPumpCapacity output network variable then indicates the current actual sensor value as a percentage of the maximum value of the sensor range.

The nvoPressure output network variable always provides the actual differential pressure value determined internally by the pump, which may vary from the sensor value. This is used to analyse the system behaviour. The differential pressure setpoint is still preset via the nviPumpSetpoint input network variable if the nviRemotePress network input variable is used.

If an invalid value is sent to the nviRemotePress input network variable or no value has been received for longer than defined in nciRcvHrtBt, the pump returns to internal control and the control mode defined in nciControlMode.

The overriding nviOvdSpeed setpoint input also overrides the control with external sensor.

nviRemotePress has priority over nviRemoteTemp.

**Caution:** To ensure stable control, nviRemotePress must be sent every 3 s. Even in this case, stable control of all pump types cannot be ensured however.

Value range

-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Default value: 3276.7 kPa.

### Remote temperature sensor input

network input SNVT\_temp\_p nviRemoteTemp

This optional input network variable allows an external temperature sensor to be used to control the pump. If a valid value is received, the pump automatically switches to temperature-dependent differential pressure control mode. Control by means of an external sensor is indicated in the nvoPumpStatus.pump\_ctrl.remote\_temp network variable.

The nvoPumpCapacity output network variable then indicates the current actual sensor value as a percentage of the upper limit of the sensor range. If an invalid value is sent to the nviRemoteTemp input network variable or no value is received for longer than defined in nciRcvHrtBt, the pump returns to internal control and to the control mode defined in nciControlMode.

The overriding nviOvdSpeed and nviOvdPress setpoint inputs also override control by means of an external sensor.

nviRemotePress has priority over nviRemoteTemp.

Value range

-273.17 ... +327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Default value: 327.67 °C.



**Pump status diagnostic information**

network output SNVT\_dev\_status nvoPumpStatus

This output network variable provides bit-coded information about the pump status.

Value range

Bit	Description
device_fault	Pump error (see nvoPumpFault for detailed information)
supply_fault	Supply error (mains voltage, phase missing, dry run, etc. See nvoPumpFault for detailed information)
speed_low	Lower control limit (pump is running at minimum speed, which is why the required operating point cannot be achieved)
speed_high	Upper control limit (pump is running at maximum speed, which is why the required operating point cannot be achieved)
setpt_out_of_range	Setpoint exceeded/fallen short of
local_control	Local operation (by ext. off, ext. min or IR monitor)
running	Pump is running
remote_press	Control by means of external pressure sensor
remote_temp	Control by means of external temperature sensor

Transmission

This value is automatically transmitted whenever a change is made. Furthermore, this value is transmitted regularly if the nciSndHrtBt configuration input was described with a valid clock.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: acknowledged

**Pump Pressure**

network output SNVT\_press nvoPressure

This optional output network variable provides the differential pressure between the pump flanges determined internally by the pump.

Value range

0 – 3276.6 kPa ( in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Transmission

This value is automatically transmitted if it deviates from the value transmitted last by more than 5% of the value in nroPumpChar.pressMax.

#### Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

#### **Pump flow**

network output SNVT\_flow\_p nvoFlow

This optional output network variable provides the flow rate determined by the pump.

#### Value range

0 - 655.34 m<sup>3</sup>/h (in 0.01 m<sup>3</sup>/h steps). 655.35 m<sup>3</sup>/h is an invalid value.

#### Transmission

This value is automatically transmitted if it deviates from the value transmitted last by more than 5% of the value in nroPumpChar.flowMax.

#### Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

#### **Pump speed**

network output SNVT\_rpm nvoSpeed

This optional output network variable provides the speed of the pump.

#### Value range

0 – 65535 rpm (in 1 rpm steps).

#### Transmission

This value is automatically transmitted if it deviates from the value transmitted last by more than 5% of the value in nroPumpChar.speedMax.

#### Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Pump override active**

network output SNVT\_switch nvoPumpOverride

This optional output network variable provides the status of the overriding settings.

Value range

Status	Value	Function
0	0	NORMAL
1	200	OVERRIDE
255	0 – 255	Invalid

Transmission

This value is transmitted whenever a change is made.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Runtime**

network output SNVT\_time\_hour nvoRuntime

This optional output network variable provides the operating hours of the pump, or with double pumps, the time during which at least one pump was running. The counter is reset to 0 h after 65535 h.

Value range

0 – 65535 h (in 10 h steps), (max. 2730 d or 7.48 a).

Transmission

This value is transmitted whenever a change is made.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Fault states of the pump**

network output SNVT\_dev\_fault nvoPumpFault

This optional output network variable provides bit-coded error information of the pump. Errors can be device errors or supply errors.

Value range

Bit	Description
sf_voltage_low	Supply error, mains voltage too low
sf_voltage_high	Supply error, mains voltage too high
sf_phase	Supply error, phase missing
sf_no_fluid	Supply error, dry running
df_motor_temp	Device error, excess motor temperature
df_motor_failure	Device error, motor defective
df_pump_blocked	Device error, pump blocked
df_elect_failure_nf	Device error, electronic error
df_elect_failure	Device error, electronics defective
df_sensor_failure	Device error, sensor defective

Transmission

This value is transmitted whenever a change is made.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Maintenance states**

network output SNVT\_dev\_maint nvoMaintenance

This optional output network variable provides bit-coded service information of the pump.

Value range

service\_required = service required

Transmission

This value is transmitted whenever a change is made.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Fluid temperature**

network output SNVT\_temp\_p nvoFluidTemp

This optional output network variable provides the fluid temperature.

Value range

-273.17 – 327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Transmission

This value is automatically transmitted if it deviates from the value transmitted last by more than 5 °C.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Power consumption in watts**

network output SNVT\_power nvoPower

This optional output network variable provides the power consumption of the pump or, in the event of double pumps, the total power output of the master and slave.

Value range

0 – 6553,5 W (in 0,1 W steps).

Transmission

This value is automatically transmitted if it deviates from the value transmitted last by more than 10% of the maximum power consumption of the pump.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

**Power consumption in kW**

network output SNVT\_power\_kilo nvoPowerKilo

This optional output network variable provides the power consumption of the pump or, in the event of double pumps, the total power output of the master and slave.

Value range

0 – 6553.5 kW (in 0.1 kW steps).

Transmission

This value is automatically transmitted if it deviates from the value transmitted last by more than 10% of the maximum power consumption of the pump.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Energy consumption

network output SNVT\_elec\_kwh nvoEnergyConsum

This optional output network variable provides the energy consumption of the pump or, in the case of double pumps, the total energy consumption of the master and slave. The counter is reset to 0 kWh after 65535 kWh.

Value range

0 – 65535 kWh (in 1 kWh steps).

Transmission

This value is transmitted whenever a change is made.

Transmission frequency

The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Control mode for normal operation

network input config SNVT\_dev\_c\_mode nciControlMode

This optional input network variable defines the control mode for normal operation of the pump if no external sensors are used and no overriding settings are active.

Value range

Value	Function
DCM_SPEED_CONST	Constant speed mode
DCM_PRESS_CONST	Constant pressure mode
DCM_PRESS_COMP	Compensated pressure mode
DCM_PRESS_AUTO	Temperature-dependent differential pressure

Default value

DCM\_PRESS\_COMP

SCPT reference: SCPTdeviceControlMode (238)

**PressTemp**

network input config UCPTpressTemp nciPressTemp

This SALMSON-specific input network variable defines the characteristic curve for the DCM\_PRESS\_AUTO control mode. This variable is stored in the EEPROM.

If the LON IF-module is connected to a pump with other pump characteristics .

The default values are reset.

**Value range**

The value range depends on the individual network variable types which are used in the following data field:

typedef struct

```
{
    SNVT_temp_p TempMin
    SNVT_temp_p TempMax
    SNVT_press PressMin
    SNVT_press PressMax
}
```

UCPTPressTemp

**Default values**

TempMin = 50 °C

TempMax = 90 °C

PressMin = nroPumpChar.pressMax / 2

PressMax = nroPumpChar.pressMax / 2 + 9.8 kPa

SCPT reference: none; implemented as UCPT

**Remote pressure sensor minimum value**

network input config nciRemMinPress

This optional input configuration network variable defines the lower limit value of an external differential pressure sensor. This network variable is not currently assigned any function.

**Value range**

-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

**Default value**

<nciRemMinPress> = 3276.7 kPa

SCPT reference: SCPTminRemotePressureSetpoint (239)

### **Remote pressure sensor maximum value**

network input config nciRemMaxPress

This optional input configuration network variable defines the upper limit value of an external differential pressure sensor. This network variable has an influence on the relative setpoint settings via nviPumpSetpoint and on the value supplied by nvoPumpCapacity if the preset value is smaller than nroPumpChar.pressMax. Larger values are always limited internally to nroPumpChar.pressMax.

Value range

-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Default value

<nciRemMaxPress> = 3276.7 kPa

SCPT reference: SCPTmaxRemotePressureSetpoint (240)

### **Remote temperature sensor minimum value**

network input config nciRemMinTemp

This optional input configuration network variable is currently not assigned to any function.

Value range

-273.17 – 327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Default value

<nciRemMinTemp> = 327.67 °C

SCPT reference: SCPTminRemoteTempSetpoint (243)

### **Remote temperature sensor maximum value**

network input config nciRemMaxTemp

This optional input configuration network variable is currently not assigned to any function.

Value range

-273.17 – 327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Default value

<nciRemMaxTemp> = 327.67 °C

SCPT reference: SCPTmaxRemoteTempSetpoint (244)



**Pump Characteristic**

network output config nroPumpChar

This output configuration network variable provides a data field with the pump characteristics.

Value range

The value range depends on the individual network variable types which are used in the following data field:

```
typedef struct {
    SNVT_rpm speedMax;
    SNVT_press pressMax;
    SNVT_flow_p flowMax;
} SCPT_PumpCharacteristic;
```

Default value

The default values depend on the respective pump types.

SCPT reference: SCPTpumpCharacteristic (233)

**Receive heartbeat**

network input config SNVT\_time\_sec nciRcvHrtBt

This optional input configuration network variable defines a clock for the reception of the nviRemotePress and nviRemoteTemp network variables. If the network variables in concern are not updated at least once within the clock specified here, the pump assumes the default values, i. e. local control until a valid value is received for nviRemotePress or nviRemoteTemp.

Value range

0.0 – 6553.4 s (in 0.1 s steps). The value 0.0 s switches off the reception monitoring function. The invalid value 6553.5 s has the same effect as the value 0.0 s.

Default value

0.0 s (reception monitoring function switched off)

SCPT reference: SCPTmaxRcvTime (48)

**Setpoint preset**

This additional input configuration network variable stores the setpoint setting for the pump (nviPumpSetpoint) in the EEPROM of the IF-module LON in a non-volatile manner. The pump runs with this value after an interruption to the power supply until a valid value is set for nviPumpSetpoint via the LON.

Value range

See PumpSetpoint

Default value

Status = 1, value = 200 = 100%.

SCPT reference: SCPTSetpoint (213)

### **Send heartbeat**

network input config SNVT\_time\_sec nciSndHrtBt

This input configuration network variable defines a clock at which certain output network variables are automatically sent (nvoPumpCapacity, nvoEffOpMode, nvoControlMode and nvoPumpStatus). A different network variable is sent with each clock.

Value range

0.0 – 6553.4 s (in 0.1 s steps). The value 0.0 s switches automatic sending off. The invalid value 6553.5 s has the same effect as the value 0.0 s.

Default value: 0.0 s (automatic sending switched off)

SCPT reference: SCPTmaxSendTime (49)

### **Minimum send time**

network input config SNVT\_time\_sec nciMinOutTm

This optional input configuration network variable defines a minimum clock for the automatic transmission of network variables. The network variables are normally transmitted automatically if they have changed or if they have been changed at least by a certain amount. This network variable now has the effect that two transmission procedures are performed only at the specified interval. This is used, for example, to reduce the system load. The individual network variables are sent cyclically.

Value range

0.0 – 6553.4 s (in 0.1 s steps). The value 0.0 s switches off the minimum clock. The invalid value 6553.5 s has the same effect as the value 0.0 s.

Default value: 0.0 s

SCPT reference: SCPTminSendTime (52)

### **Object major version**

network output config unsigned short nciObjMajVer

This output configuration network variable provides the high byte for the software version.

SCPT reference: SCPTobjMajVer (167)

### **Object minor version**

network output config unsigned short nciObjMinVer

This output configuration network variable provides the low byte for the software version.

SCPT reference: SCPTobjMinVer (168)

## 7 Installation and electrical connection

The installation and electrical connections should be performed only by skilled staff in compliance with local regulations!



**WARNING! Danger of injury!**

The existing accident prevention regulations should be observed.



**WARNING! Danger from electric shock!**

Any hazards from electrical current should be ruled out.

Any local or general directives [e.g. IEC, VDE etc.] and directives of the local power supply companies should be observed.

### 7.1 Installation and electrical connection of the IF-module



**NOTE:** The IF-module LON is equipped with a Neuron ID double sticker. One sticker remains on the IF-module, the other sticker can, for example, be stuck on the system plan in the position of the corresponding pump. The Neuron ID from the system plan can be read in with a barcode scanner or entered manually during binding.



**CAUTION! Risk of damage to the IF-module!**

**The IF-module LON may only be connected or disconnected if the pump is electrically isolated.**

- Electrically isolate the pump.
- Remove the terminal box cover after undoing the screws.
- Connect the IF-module to the circuit board interface:
  - S X E - D X E                      Fig. 3a
  - Siriux -SiriuxD                      Fig. 3b
  - LRE/JRE                              Fig. 3c
  - SIE /DIE                              Fig. 3d



**NOTE:** In order to adhere to the EMC standards specified in the installation and operating instructions for the Stratos series, a shielded cable should be used to connect the LON interface.

To apply this cable shield at the pump properly, use the metallic cable connections supplied with the IF-module Siriux LON .

To install this cable connection and the corresponding cable, proceed as follows (Fig. 4):

- Remove the plastic cable connection and the corresponding parts from the cable feed of the control module (Fig. 4, pos. 4a).
- Screw the metallic cable connection into the cable feed of the control module (Fig. 4, pos. 4b).
- Separate 10...15 mm of the outer cable sheath of the shielded cable and fold the cable shield over the outer sheath (Fig. 4, pos. 4c).
- Insert the cable in the cable connection until the folded cable shield is held securely by the contact springs (Fig. 4, pos. 4d).



- Connect the individual wires to the “LON” terminals of the IF-module.  
NOTE: The two “LON” terminals at the IF-module are protected against twisting, i.e. the individual wires can be connected to any of these terminals.
- Tighten the cap nuts of the cable connection with a suitable tool (Fig. 4, pos. 4e). If the space in the terminal room of the pump is cramped, an alternative type of installation may make sense:
- Insert the cable through the cable connection.
- Apply the individual wires to the terminals of the IF-module (IF-module is not yet connected).
- Bunch the individual wires of the cable to form a loop and install the IF-module.
- Fit the terminal box cover.

## 8 Commissioning



### CAUTION!

**The installation and operating instructions of the pump should be observed during commissioning.**

Commissioning is described by the example of a pump with IF-module LON. If there are several pumps with IF-module LON, proceed accordingly.

- Switch on the mains voltage of the pump(s).
- A network management tool or the “Nodeutil.exe” program from Echelon is used to configure the IF-module LON and switch it online.
- The network variables should be linked to the network variables of other nodes during the installation.
- The identification of the IF-module LON required for the installation is performed with the sticker with the 128 barcode of the Neuron ID. One half of the sticker can be stuck onto the system plan for example.
- The IF-module LON uses self documentation, i.e. the description of the network variables contained in the IF-module is stored in the IF-module and evaluated by network management tools. Furthermore, corresponding XIF and XFB files are available. The network management tools for non-LonMark-defined data types are supported by device-resource files.
- According to the LonMark Application Layer Interoperability Guidelines, the IF-module LON is delivered in “application unconfigured” condition. If the IF-module receives a “wink” command via the LON bus, a corresponding command is sent to the pump also in this condition and the “Id on/off” menu is displayed at the pump for 30 s.
- The IF-module Stratos LON has a button (Fig. 5, pos. 1) which can be operated with a pointed object (e.g. a ballpoint pen). When this button is actuated, the IF-module Stratos LON sends a network message in which the Neuron ID is transmitted.

An LED (Fig. 5, pos.2) goes on briefly if the IF-module is configured and switched online after switching on the pump or after a reset.

- Once the LON IF-module has been configured and switched online, a double arrow appears on the pump display (Fig. 6, pos. 1) to indicate the existing communication. Local operation of the pump with the red button is disabled. Exceptions:
  - Settings for the peak load or main/standby operation double pump functions
  - You can access the "Id" menu by turning the red button. A network message is sent in which the Neuron ID is transmitted by pressing the red button in this menu item.



NOTE: The IF-module LON no longer works if there is an interruption to the power supply of the pump. All input network variables (nvi...) are reset to their default values when the power supply is switched on again.

## 9 Maintenance

**Have maintenance and repair work carried out by qualified skilled personnel only!**



**WARNING! Danger from electric shock!**

**Any danger from electrical current should be ruled out.**

**The pump should be electrically isolated and secured against unauthorised switch-on during any maintenance or repair work.**



NOTE: The IF-module LON has a program memory which can be deleted and overwritten to allow subsequent software updates to be loaded into this memory via the LON bus.

10 Faults, causes and remedies

10.1 Connection between error codes and LON bus fault signals

LCD code	signification	nvoPumpFault set bits	nvoPumpStatus set bits	nvoMaintenance set bits	nvoStatus Signal
E04	Mains undervoltage	pump_ctrl.sf_voltage_low	pump_ctrl.supply_fault	pump_ctrl.service_required	electrical_fault
E05	Mains overvoltage	pump_ctrl.sf_voltage_high	pump_ctrl.device_fault		in_alarm
E06	2-phase operation	pump_ctrl.sf_phase	pump_ctrl.supply_fault		electrical_fault
E10	Blocking	pump_ctrl.df_pump_blocked	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E11	Motor idling	pump_ctrl.sf_no_fluid	pump_ctrl.device_fault		in_alarm
E12	Impeller/rotor difficult to move	pump_ctrl.df_pump_blocked	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E16	Bearing wear	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E20	Excess winding temperature	pump_ctrl.df_motor_temp	pump_ctrl.device_fault		in_alarm
E21	Motor overload	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault
E23	Short circuit/earth leakage	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E24	Winding fault	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault
E25	Contact error/winding open	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E26	Winding temp. probe open	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault
E27	Speed sensor defective	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E30	Excess module temperature	pump_ctrl.df_elect_failure_nf	pump_ctrl.device_fault		in_alarm
E31	Excess power section temp.	pump_ctrl.df_elect_failure_nf	pump_ctrl.device_fault		in_alarm
E34	Module/pump assignment	pump_ctrl.df_elect_failure_nf	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E36	Loading relay/PFC defective	pump_ctrl.df_elect_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E37	Intermediate gyrocompass defective	pump_ctrl.df_elect_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E38	Medium temp. sensor	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E40	Ext. pressure sensor defective	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E41	Ext. vibration sensor defective	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E50	GLT timeout	pump_ctrl.df_elect_failure	pump_ctrl.device_fault	pump_ctrl.service_required	unable_to_measure
E52	DP timeout	pump_ctrl.df_elect_failure_nf	pump_ctrl.device_fault		in_alarm



NOTE: The installation and operating instructions for the respective pumps should be observed during error diagnostics.

**If the pump/IF-module malfunction is unable to be rectified, please contact a specialist or the nearest Wilo customer service or representative.**

**We reserve the right to make technical changes.**