

Data sheet

LON module

for Kamstrup electricity meters

- For mounting in Kamstrup electricity meters
- FT-X1-topology
- Simple installation with visual module indication (WINK)
- Standard twisted pair transceiver, data speed 78 kbit/sec.
- Flash program memory (exchangeable software)
- Pulse input
- Relay output for load control (230 VAC, max. 100 mA)



Application

The LON module is used for data transfer from electricitymeters Kamstrup 162, 282, 382 and 351B via the LON-bus.

The module is based on the widely used network platform LonWorks designed by the Echelon Corporation. The technology is used in a wide selection of many different industries, including systems for energy surveillance.

The module uses the application protocol LonTalk, which is based on a wide variety of pre-terminated network variables, also called SNVTs.

The LON module reads data from the meter every 30 seconds, and these data will subsequently be available for other components on the LON-bus.

Network variables

Below-mentioned SNVTs have been selected for the individual network variables in the LON module. The listed network variables are described in more detail in the Technical Description of the LON module.

NV name	NV Index	SNVT Type	Unit	Range	OBIS Code	Description
nviRequest	0	SNVT_obj_request	Structure			Node Request
nvoStatus	1	SNVT_obj_status	Structure			Node Status
nvoDateTime	2	SNVT_time_stamp	YY:MM:DD hh:mm:ss	Now ↔ Year 3000	0.9.2-0.9.1	Date and time
nvoTimePowrMax	3	SNVT_time_stamp	YY:MM:DD hh:mm:ss	Now ↔ Year 3000		Time stamp for act.pos. max power (P14)
nvoTimePowrMaxT1	4	SNVT_time_stamp	YY:MM:DD hh:mm:ss	Now ↔ Year 3000		Time stamp for act.pos. max power T1 (P14)
nvoTimePowrMaxT2	5	SNVT_time_stamp	YY:MM:DD hh:mm:ss	Now ↔ Year 3000		Time stamp for act.pos.max power T2 (P14)
nvoPowerRPos	6	SNVT_count_f	VAR	-1.10 ³⁸ ↔ 1.10 ³⁸	3.7.0	Actual Q+ reactive pos. Power (Q12)
nvoPowerRNeg	7	SNVT_count_f	VAR	-1.10 ³⁸ ↔ 1.10 ³⁸	4.7.0	Actual Q- reactive neg. Power (Q34)
nvoEnergyRPos	8	SNVT_count_f	VARh	-1.10 ³⁸ ↔ 1.10 ³⁸	3.8.0	R+ Reactive pos. Energy (R12)
nvoEnergyRNeg	9	SNVT_count_f	VARh	-1.10 ³⁸ ↔ 1.10 ³⁸	4.8.0	R- Reactive neg. Energy (R34)
nvoEnergyReact	10	SNVT_count_f	VARh	-1.10 ³⁸ ↔ 1.10 ³⁸	5.8.0	R1 Reactive energy (R1)
nvoPowerMaxRPos	11	SNVT_count_f	VAR	-1.10 ³⁸ ↔ 1.10 ³⁸		Max Q+ reactive pos. max power (Q12)
nvoPowerMaxRNeg	12	SNVT_count_f	VAR	-1.10 ³⁸ ↔ 1.10 ³⁸		Max Q- reactive neg. max power (Q34)
nvoHourCount	13	SNVT_count_f	Hour	-1.10 ³⁸ ↔ 1.10 ³⁸	96.8.0	Hour counter
nvoPowerMaxRPsAc	14	SNVT_count_f	VAR	-1.10 ³⁸ ↔ 1.10 ³⁸	3.2.0	Accumulated reactive pos. max power (Q12)
nvoPowerMaxRNeAc	15	SNVT_count_f	VAR	-1.10 ³⁸ ↔ 1.10 ³⁸	4.2.0	Accumulated reactive neg. max power (Q34)
nvoPowerAPos	16	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	1.7.0	Actual P+ active pos. Power (P14)
nvoPowerANeg	17	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	2.7.0	Actual P- active neg. Power (P23)
nvoPowerMaxAPos	18	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸		Max P+ active pos. max power (P14)
nvoPowerMaxAPoT1	19	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸		Max P+ T1 active pos. max power (P14)
nvoPowerMaxAPoT2	20	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸		Max P+ T2 active pos. max power (P14)
nvoPowerMaxANeg	21	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸		Max P- active neg. max power (P23)
nvoPowerMaxAPoAc	22	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	1.2.0	Accumulated active pos. max power (P14)
nvoPowerMaxANeAc	23	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	2.2.0	Accumulated active neg. max power (P23)
nvoPowerL1	24	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	21.25.0	Actual power phase L1 (P14)
nvoPowerL2	25	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	41.25.0	Actual power phase L2 (P14)
nvoPowerL3	26	SNVT_power_f	W	-1.10 ³⁸ ↔ 1.10 ³⁸	61.25.0	Actual power phase L3 (P14)
nvoCurrentL1	27	SNVT_amp_f	A	-3.10 ³⁸ ↔ 3.10 ³⁸	31.25.0	Actual current phase L1
nvoCurrentL2	28	SNVT_amp_f	A	-3.10 ³⁸ ↔ 3.10 ³⁸	51.25.0	Actual current phase L2
nvoCurrentL3	29	SNVT_amp_f	A	-3.10 ³⁸ ↔ 3.10 ³⁸	71.25.0	Actual current phase L3
nvoEnergyAPos	30	SNVT_elec_kwh_l	kWh	-2.10 ⁸ ↔ 2.10 ⁸	1.8.0	A+ Active pos. energy (A14)
nvoEnergyANeg	31	SNVT_elec_kwh_l	kWh	-2.10 ⁸ ↔ 2.10 ⁸	2.8.0	A- Active neg. Energy (A23)
nvoEnergyAct	32	SNVT_elec_kwh_l	kWh	-2.10 ⁸ ↔ 2.10 ⁸	15.8.0	Active energy (A1234), NB: not valid in K351B
nvoEnergyAPosT1	33	SNVT_elec_kwh_l	kWh	-2.10 ⁸ ↔ 2.10 ⁸	1.8.1	A+ T1 Active pos. energy in T1 (A14)
nvoEnergyANegT1	34	SNVT_elec_kwh_l	kWh	-2.10 ⁸ ↔ 2.10 ⁸	2.8.1	A- T1 Active neg. energy in T1 (A23)
nvoEnergyAPosT2	35	SNVT_elec_kwh_l	kWh	-2.10 ⁸ ↔ 2.10 ⁸	1.8.2	A+ T2 Active pos. energy in T2 (A14)

Network variables

NV name	NV Index	SNVT Type	Unit	Range	OBIS Code	Description
nvoEnergyANegT2	36	SNVT_elec_kwh_l	kWh	-2·10 ⁸ ↔ 2·10 ⁸	2.8.2	A- T2 Active neg. energy in T2 (A23)
nvoPulseEnergy	37	SNVT_elec_whr_f	Wh	0 ↔ 1·10 ³⁸		Pulse Input Energy
nvoPulseVol	38	SNVT_vol_f	L	0 ↔ 1·10 ³⁸		Pulse Input Volume
nvoVoltageL1	39	SNVT_volt_ac	V	0 ↔ 65534	32.25.0	Actual voltage phase L1
nvoVoltageL2	40	SNVT_volt_ac	V	0 ↔ 65534	52.25.0	Actual voltage phase L2
nvoVoltageL3	41	SNVT_volt_ac	V	0 ↔ 65534	72.25.0	Actual voltage phase L3
nvoMeterNumber1	42	SNVT_count_32	Number	32 bit		Meter number 1
nvoSerialNumber	43	SNVT_count_32	Number	32 bit	96.1.0	Meter serial number
nvoStatusInfo	44	SNVT_count_32	Structure [*1]	32 bit		Meter status info
nvoRelayFeedback	45	SNVT_state	Structure [*2]	16 bit		Meter Relay CutOff Feedback
nvoAuxIn	46	SNVT_count	On / Off	0 or 1		Aux. I/O input
nvoMeterType	47	SNVT_str_asc	ASCII string	31 chars		Meter Type and revision
nviDateTime	48	SNVT_time_stamp	YY:MM:DD hh:mm:ss	Now ↔ Year 3000		New date and time for meter
nviAuxOut	49	SNVT_count	On / Off	0 or 1		Aux. I/O output
nviRelayCutOffSt	50	SNVT_count	State [*3]	1, 2 or 3		Meter Relay CutOff State

*1) Info code direct from the meter

- +0000001: Meter reset
- +0000010: EEPROM error
- +0000100: Critical magnetic field registered
- +0001000: RAM error
- +0010000: ROM checksum error
- +0100000: Alarm input
- +1000000: Front cover open

*2) 16 bit structure with feedback information from cutoff relays (only relevant for meters with cutoff)

- bit 0: Voltage on L1 (1 = voltage, 0 = no voltage)
- bit 1: Voltage on L2 (1 = voltage, 0 = no voltage)
- bit 2: Voltage on L3 (1 = voltage, 0 = no voltage)
- bit 3: Validation of the above (1 = Bit 0-2 are valid)
- bit 4: Communication with cutoff PCB (1 = OK, 0 = error)
- bit 5-7: - n/a -
- bit 8-12: Coupling status [1-8]

*3) Controls the status of the cutoff relays (only relevant for meters with cutoff)

- 1: Disconnection
- 2: Switch on released
- 3: Switch on

See Technical Description for further details.

Technical data

Electrical data

Supply	Internal supply from electricity meter
Current consumption	40 mA (max. 75 mA)
Transceiver type	FT-X1
Cable length	500..2700 m (depending on cable type and network topology)
Recommended cable	22-24 AWG, twisted pair*
Load control	230 VAC, max. 100 mA

Mechanical data

Temperature	-40 °C - +85 °C
Protection class	IP51 mounted in electricity meter
Relative humidity	< 95 %, non-condensing
Weight	Approx. 50 g
Dimensions, W x L x H	42 mm x 92 mm x 17 mm

Marking/approvals

CE Marking	Fulfils electricity meter standards at present in force
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* See "LonMark Layers 1-6, Interoperability Guide-Lines" for further information.

Data/communication

Protocol	LonTalk
Transmission speed	78 kbit/sec.
Data update	The module is updated by the meter every 30 sec.
Data transmission	Data transmission on request

Pulse input

Max. cable length	20 m
Max. cable capacity	100 nF
Max. leak current contact	0.5 µA
Max. frequency	0.5 Hz
Min. pulse duration	1 s.
Min. duration of pause	1 s.

Installation

The LON module can be used in generation J or newer of direct meters Kamstrup 162, 282 and 382 as well as in the indirect meter, Kamstrup 351B. In connection with DIN-rail variants as well as meters of generations BCDE the module must be used in combination with a supply module which is included in the ordering number. The order numbers of the two variants of the LON module can be found under ordering details. The module is mounted in the electricity meter's module area where it is supplied by the meter's internal module supply. The LON module with separate supply module is connected to one of the meter's phase terminals. The module's other external input/output connections are described below.



LON-communication

- 55 LON 1
- 56 LON 2

Pulse input

- 65 Pulse 1 +
- 66 Pulse 2 -

Relay for load control

- 18 Terminal 1
- 19 Terminal 2

The application starts when the module is connected and immediately begins reading the meter.

A meter with LON module can e.g. be installed in a LON-network by means of the installation tool LonMaker from ECHELON.

LON module

Software

The LON module's firmware can e.g. be updated in connection with changes or extensions of SNVTs. The software can be upgraded via the LON-bus by means of the tool LonMaker.

Ordering details

Description	Type number
LON module + supply	6850-057.1
LON module	6850-057.2

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