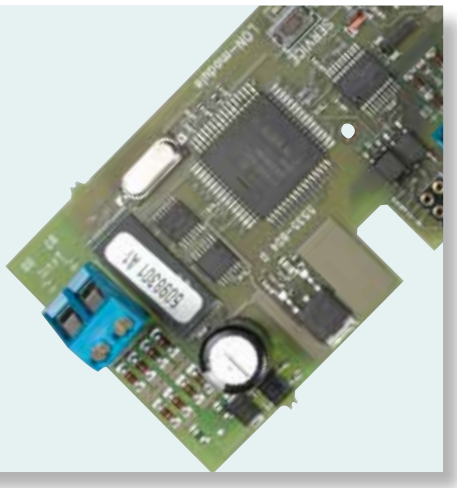
# LON module for MULTICAL® 601 & 801

## DATA SHEET

- **Free topology, FTT-10A and FT-X1**
- **Plug-in module for MULTICAL® 601/801**
- **2 extra pulse inputs**
- **Easy to fit with visual indication of module (WINK)**
- **Standard twisted pair transceiver78 kBit/s**
- **24 VAC ±30% supply**
- **Coprocessor for improving the LON Bus communication**
- **Flash program memory (replaceable software)**



## Application

The LON-module is used to transmit data from MULTICAL® 601/801, either in connection with data acquisition or regulation, by means of a LON-network. An ideal solution for air conditioning and building automation. The communication rate is high, making it possible to connect a large number of applications on the same LON-network.

The cables between the LON-module and the LON-nodes are standard twisted pair cables with lengths up to 2700 m in bus topology or 500 m in free topology.

The LON-module comprises an independent network node and a neuron-chip, memory, transceiver and an input circuit. The module can be supplied by 24 VAC. The optimal solution is to supply the module parallel to MULTICAL® 601 (24 VAC version).

In MULTICAL® 801 the module can be internally supplied from terminals 97A and 98A.

The LON-module reads new MULTICAL® data in a cycle ensuring that all data are updated every 30 seconds. Network variables that have changed since the last reading will be updated on the bus. All network variables can be polled from the other LON-nodes on the network.

If heartbeat is selected, data ("HB-data") will be sent every 30 seconds.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## Network variables

The LON-module manages the following MULTICAL® 601/801 data strings as 36 SNVTs (standard network variables):
For further information on SNVT formats, please refer to the SNVT Master List, published by the Echelon Corporation. During installation the LON-module is self-documenting.

| D1 | NV Name | NV Index | SNVT Type | Unit | MULTICAL® 601/801 Register | Description | HB |
|---|---|---|---|---|---|---|---|
| Node Object | nviRequest | 0 | SNVT_obj_request | Structure | | Node Request | |
| | nvoStatus | 1 | SNVT_obj_status | Structure | | Node Status | ✓ |
| | nvoInfoCode | 2 | SNVT_state | Structure (*1) | Info | Info code from MULTICAL® 601/801 | ✓ |
| | nvoHourCount | 3 | SNVT_count_f | hour | Hour | Hour counter from MULTICAL® 601/801 | |
| | nvoDateTime | 4 | SNVT_time_stamp | YY:MM:DD hh:mm:ss | Date & Time | Date and Time from MULTICAL® 601/801 | |
| Heat Meter | nvoE1_HeatV1 | 5 | SNVT_elec_whr_f | Wh | E1 | Heat Energy (V1) | ✓ |
| | nvoE1_HeatV1_Raw | 6 | SNVT_reg_val | Raw, Unit, Decimal | E1 | Scaled heat energy (V1) | ✓ |
| | nvoE2_Control | 7 | SNVT_elec_whr_f | Wh | E2 | Control energy | |
| | nvoE3_Cool | 8 | SNVT_elec_whr_f | Wh | E3 | Cooling energy | ✓ |
| | nvoE4_Forward | 9 | SNVT_elec_whr_f | Wh | E4 | Flow energy | |
| | nvoE5_Return | 10 | SNVT_elec_whr_f | Wh | E5 | Return energy | |
| | nvoE6_TapWater | 11 | SNVT_elec_whr_f | Wh | E6 | Tap water energy | |
| | nvoE7_HeatV2 | 12 | SNVT_elec_whr_f | Wh | E7 | Heat energy (V2) | |
| | nvoPowerV1 | 13 | SNVT_power_f | W | Power1 | Power (V1) | ✓ |
| | nvoMeterNo | 14 | SNVT_str_asc | ASCII string | Meter No | Meter number | ✓ |
| | nvoConfigNo | 15 | SVNT_str_asc | ASCIi string | Config No | Meter configuration DDDEFFGGMN | |
| Flow Sensor | nvoV1_Volume | 16 | SNVT _vol_f | L | V1 | V1 Volume | ✓ |
| | nvoV1_Mass | 17 | SNVT _mass_f | g | M1 | V1 Mass | ✓ |
| | nvoV1_Flow | 18 | SNVT _flow_f | L/s | Flow1 | V1 Flow | ✓ |
| Flow Sensor | nvoV2_Volume | 19 | SNVT _vol_f | L | V2 | V2 Volume | |
| | nvoV2_Mass | 20 | SNVT _mass_f | g | M2 | V2 Mass | |
| | nvoV2_Flow | 21 | SNVT _flow_f | L/s | Flow2 | V2 Flow | |
| Temperature Sensors | nvoTemperature1 | 22 | SNVT_temp_p | °C | T1 | Temperature T1 | ✓ |
| | nvoTemperature2 | 23 | SNVT_temp_p | °C | T2 | Temperature T2 | ✓ |
| | nvoTemperature3 | 24 | SNVT_temp_p | °C | T3 | Temperature T3 | |
| | nvoTemperature4 | 25 | SNVT_temp_p | °C | T4 | Temperature T4 | |
| | nvoTemperatuDiff | 26 | SNVT_temp_p | °C | T1-T2 | Temperature difference (T1-T2) | ✓ |
| Pulse Counter | nvoPulseVA_Vol | 27 | SNVT_vol_f | L | Pulse input A Volume | Pulse input VA Volume | |
| | nvoPulseVA_E | 28 | SNVT_elec_whr_f | Wh | Pulse input A Energy | Pulse input VA Energy | |
| Pulse Counter B | nvoPulseVB_Vol | 29 | SNVT_vol_f | L | Pulse input B Volume | Pulse input VB Volume | |
| | nvoPulseVB_E | 30 | SNVT_elec_whr_f | Wh | Pulse input B Energy | Pulse input VB Energy | |
| | nvoV1_Volume_Raw | 31 | SNVT_reg_val | Raw. Unit. Decimal | V1 | V1 Volume As shown in MULTICAL® display. | |
| | nvoV2_Volume_Raw | 32 | SNVT_reg_val | Raw. Unit. Decimal | V2 | V2 Volume As shown in MULTICAL® display. | |
| | nvoE3_Cool_Raw | 33 | SNVT_reg_val | Raw. Unit. Decimal | E3 | Cooling Energy As shown in MULTICAL® display. | |
| | nvoMeterType | 34 | SNVT_str_asc | ASCII string | | | |
| | nviDateTime | 35 | SNVT_time_stamp | YY:MM:DD | Date & Time | New date and time for MULTICAL® | |
| | nviHeartbeat | 36 | SNVT_count | Off or 30sec | | 30sec heartbeat (for nvo's marked ✓ ) | ↻ |

*1) 16 bit structure primarily representing the info codes from MULTICAL® 601/801

| | |
|---|---|
| Bit 0: | MULTICAL® Reset |
| Bit 1: | -n/a- |
| Bit 2: | Temperature sensor T2 outside measuring range |
| Bit 3: | Temperature sensor T1 outside measuring range |
| Bit 4: | Flow sensor V1 communication error |
| Bit 5: | Temperature sensor T3 outside measuring range |
| Bit 6: | Leakage in the cold-water system |
| Bit 7: | Flow sensor V2 pulse value error |
| Bit 8: | Leakage in the heating system |
| Bit 9: | Burst in the heating system |
| Bit 10: | Flow sensor V10 communication error |
| Bit 11: | Flow sensor V1 pulse value error |
| Bit 12: | Flow sensor V1 air error |
| Bit 13: | Flow sensor V2 air error |
| Bit 14: | Flow sensor V1 wrong direction |
| Bit 15: | Flow sensor V2 wrong direction |

Not all info codes apply for all meters.
See Technical Description, MULTICAL® 601/801 for details.

## Technical data

### Electrical data

| | |
|---|---|
| Supply | 24 VAC ±30% |
| Power consumption | +40 mA DC |
| Transmission speed | 78 kBit/sec. |
| Transceiver type | FTT-10A and FT-X1 |
| Recommended cable | 22-24 AWG, twisted pair *). |
| Cable length | 500..2700 m, depending on cable type and installation conditions *). |
| Updating | Full update every 30 sec. |
| Transmission | When change in value since previous reading from MULTICAL®. Furthermore, all variables can be polled as required. Heartbeat can be activated. |

*) Please refer to the LONmark Layers 1-6, Interoperability Guidelines for further information.

| | |
|---|---|
| Pulse inputs | The module has two pulse inputs, which can be used for totalization of pulses from water and electricity meters.<br>The inputs, pulse resolution and unit are self-configuring based on the MULTICAL® 601/801 setup (FF and GG Codes). |

# LON module for MULTICAL® 601/801

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## Technical data

### Mechanical data

| | |
|---|---|
| Dimensions, WxHxD | 90 x 70 x 20 mm |
| Ambient temperature | 0...55°C |
| Fitting | A plug-in module for MULTICAL® 601/801. |

### Marking and approvals

Approved by the Danish TS and PTB in Germany for integration in MULTICAL® 601/801.

Requirements for CE-marking are fulfilled when the LON- module is fitted into MULTICAL® 601/801.

## Software

New software for updating or extending the module can be downloaded into the module via the LON-Network.

## Order specification

| Description | Type No. |
|---|---|
| LON-module for MULTICAL® 601 | 670024000-000 |
| LON-module for MULTICAL® 801, module 1 | 670024000-000 |
| LON-module for MULTICAL® 801, module 2 | 670Y00000-000 |
| Kamstrup Trafo 230/24 VAC | 66-99-403 |

XIF-files and standard software are available on www.kamstrup.com