

## R710

## Digital counter module



- Summary** The R710 digital counter module is a microprocessor-controlled, communicative 4 binary input counter module. The module uses Modbus RTU on a RS485 bus for communication, and can be easily integrated in a variety of supervision and control systems.
- Application**
- HVAC and industrial control systems – pulse counting from meters, load shedding etc.
- Function** The M710 module has four binary inputs which provide 12 V for external contact or open collector signal. The COM terminals are interconnected inside of the module and are common for all inputs.
- The module communicates by means of a RS485 data bus. The Modbus RTU communication protocol ensures smooth and easy integration in a number of control and data acquisition systems.
- The counters provide 4 byte values (longint). The module offers advanced functions for load shedding algorithm (E-Max): use CNT1 for energy pulses, CNT2 for 15 min. sync pulses. Additional variables are:
- pulses in current 15 min. period (resets with each sync pulse)
  - pulses in last 15 min. period (copy of pulses in current period on period end)
  - seconds in current 15 min. period (resets with each sync pulse).
- Removable connectors are used for incoming and outgoing data line so that mounting is fast and easy. The module is mounted on a DIN rail.
- The communication circuits are protected against overvoltage and galvanically separated from the rest of the module. If the module is terminating the communication bus, i.e. it is the last in line, a terminating 120 Ω resistor may be

switched on by short-circuiting of the BUS END jumpers. Two LEDs located inside of the housing enable fast diagnostics – power up and communication. To set the module to factory defaults (9600 bps, address 1), set the INIT switch to ON and remove power for 2...3 secs.

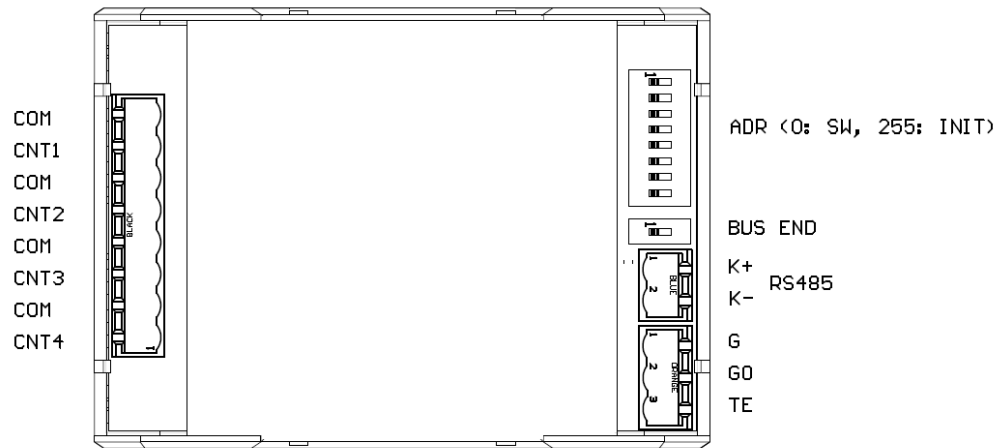
See *domat - Technical application notes* for connection examples.

All the settings are backed up in a EEPROM chip. The module is equipped with a watchdog circuit and the communication part is galvanically separated.

## Technical data

Power	24 V AC/DC ±20 %
Consumption	0.8 W
Communication	Modbus RTU RS485, 1200...115200 bit/s
Galvanic isolation	1 kV
Max. bus length	1200 m
Max. amount of modules on the bus	256
Number of inputs	4 × dry contact or open collector, 5 mA
Max. input frequency	50 Hz
Min. duty time	10 ms
Max. distance to contact	10 m
SW	ModComTool 4.2.4.6 or higher for parameters setting, Merbon IDE, SoftPLC IDE – predefined Modbus devices
Housing	Polycarbonate box (certification UL94V0) elbox 4
Terminals	screw terminals M3 (bus, power), M2 (AI inputs)
Dimensions	70.4 × 98.7 × 61.5 mm
Protection degree	IP20 (EN 60529)
Recommended wire	0.14...1.5 mm <sup>2</sup>
Ambient temperature	external conditions: -5...45 °C; 5...95 % relative humidity; non-condensing gases and chemically non-aggressive conditions (according to EN 60721-3-3 climatic class 3K5) storage: -5...45 °C; 5...95 % relative humidity; non-condensing gases and chemically non-aggressive conditions (according to EN 60721-3-1 climatic class 1K3)
Standards conformity	EMC EN 61000-6-2 ed.3:2005, EN 61000-6-4 ed.2:2006 + A1:2010 (industrial environment) Electrical safety EN 60950-1 ed.2:2006 + A11:2009 + A12:2011 + A1:2010 + A2:2014 + Opr.1:2012 + Z1:2016 Hazardous substances reduction EN 50581:2012

## Terminals



### Terminals and connectors

<b>RS485 K+</b>	port COM1 - serial link RS485, positive
<b>RS485 K-</b>	port COM1 - serial link RS485, negative
<b>G</b>	G power supply
<b>G0</b>	G0 power supply
<b>TE</b>	optional connection for shielding, technical ground
<b>COM</b>	common terminals for inputs AI1...AI8
<b>CNT1 ... CNT4</b>	inputs 1...8

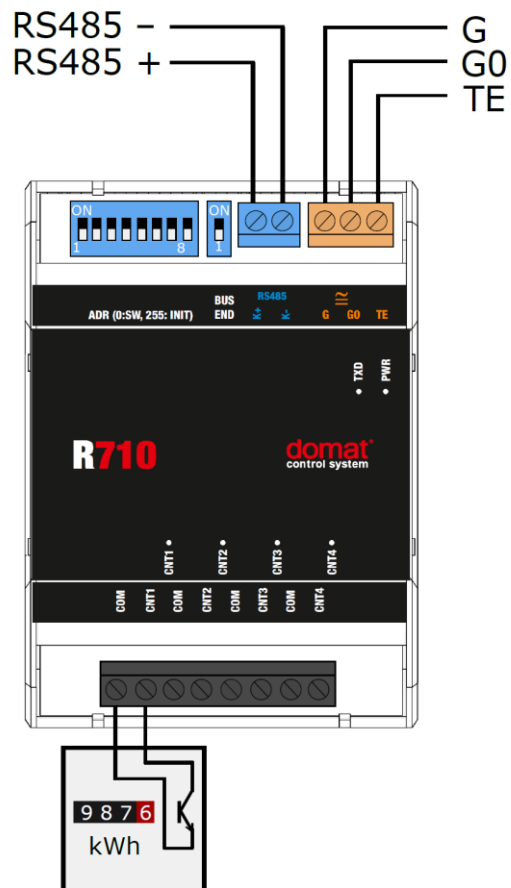
### LED indication

<b>TxD</b>	red LED – RS485 transmitting data at COM1 (flashing: transmitting data; OFF: no data traffic)
<b>PWR</b>	green LED – power supply (ON: power OK; OFF: no power applied, weak or damaged power supply, ...)

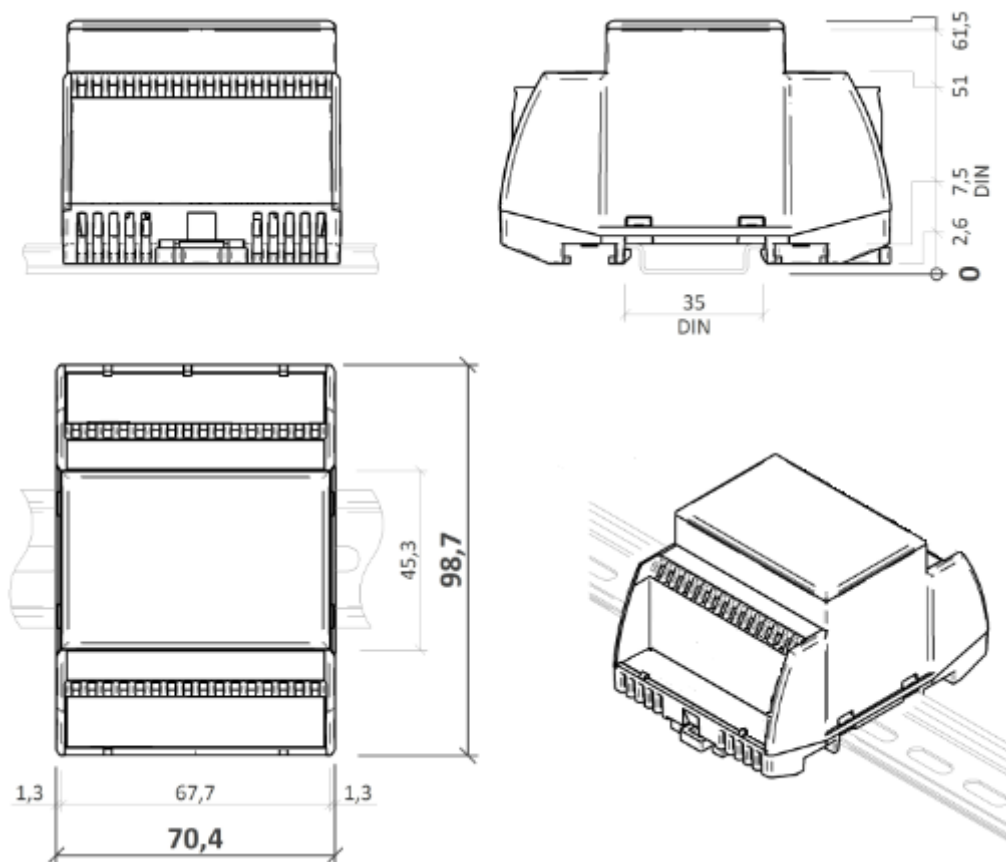
### DIP switches

<b>ADR</b>	AUTO – if all switches are OFF, the address is used according to Modbus register 4 LSB USER – address is set by DIP switches configuration INIT - if are all switches ON at power-up, configuration parameters are set to defaults DIP 8 = bit 0; switches increase their bit weight from right to left, see below
<b>BUS END</b>	Switch for bus RS485 termination (located at the RS485 connector); ON = bus end; the first and last devices on bus should have bus end ON

## Connection



## Dimensions

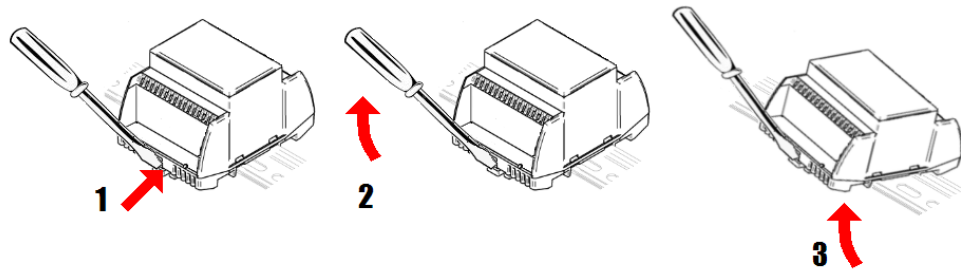


Dimensions are in *mm*.

## Installation

The R710 module is fixed on standard DIN rail (by snapping).

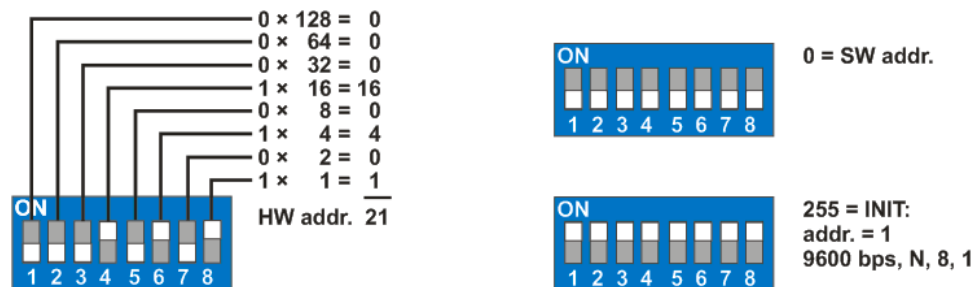
When removing the module from the DIN rail proceed as follows: Place a screwdriver in the plastic slot which is in the middle of bottom part of the module (1). Then push the screwdriver upwards (2). After that, the module can be removed by tilting it upwards (3).



## Addressing

The Modbus address can be set as follows:

- **hardwarewise:** using DIP switches. The switches increase their bit weight from right to left, see image with example where address of 21 is set by activation of switches 4, 6, and 8 with bit weight of 16, 4, and 1 respectively. Valid settable range is 1 to 254. Address 0 (all switches OFF) means that the address is set as entered in the Modbus table. Address 255 (all switches ON) brings the module to INIT mode, where Modbus address is 1 and communication parameters are set to N, 8, 1, see image below. All changes apply after the module is switched off and on again.



- **softwarewise** using the ModComTool software, available for free at [www.domat-int.com/en/](http://www.domat-int.com/en/). The default address (factory setting) is 1, default communication parameters are 9600, 8, N, 1. Parity and stopbits can be set in Modbus register 1005 LSB.  
**The software address is only active if the hardware addressing switch is set to 0.**  
All changes apply after the module is switched off and on again.

## Safety note

The device is designed for monitoring and control of heating, ventilation, and air conditioning systems. It must not be used for protection of persons against health risks or death, as a safety element, or in applications where its failure could lead to physical or property damage or environmental damage. All risks related to device operation must be considered together with design, installation, and operation of the entire control system which the device is part of.

**Changes in  
versions**

01/2020 – First datasheet version.

08/2021 – Stylistic adjustments, change of logo.