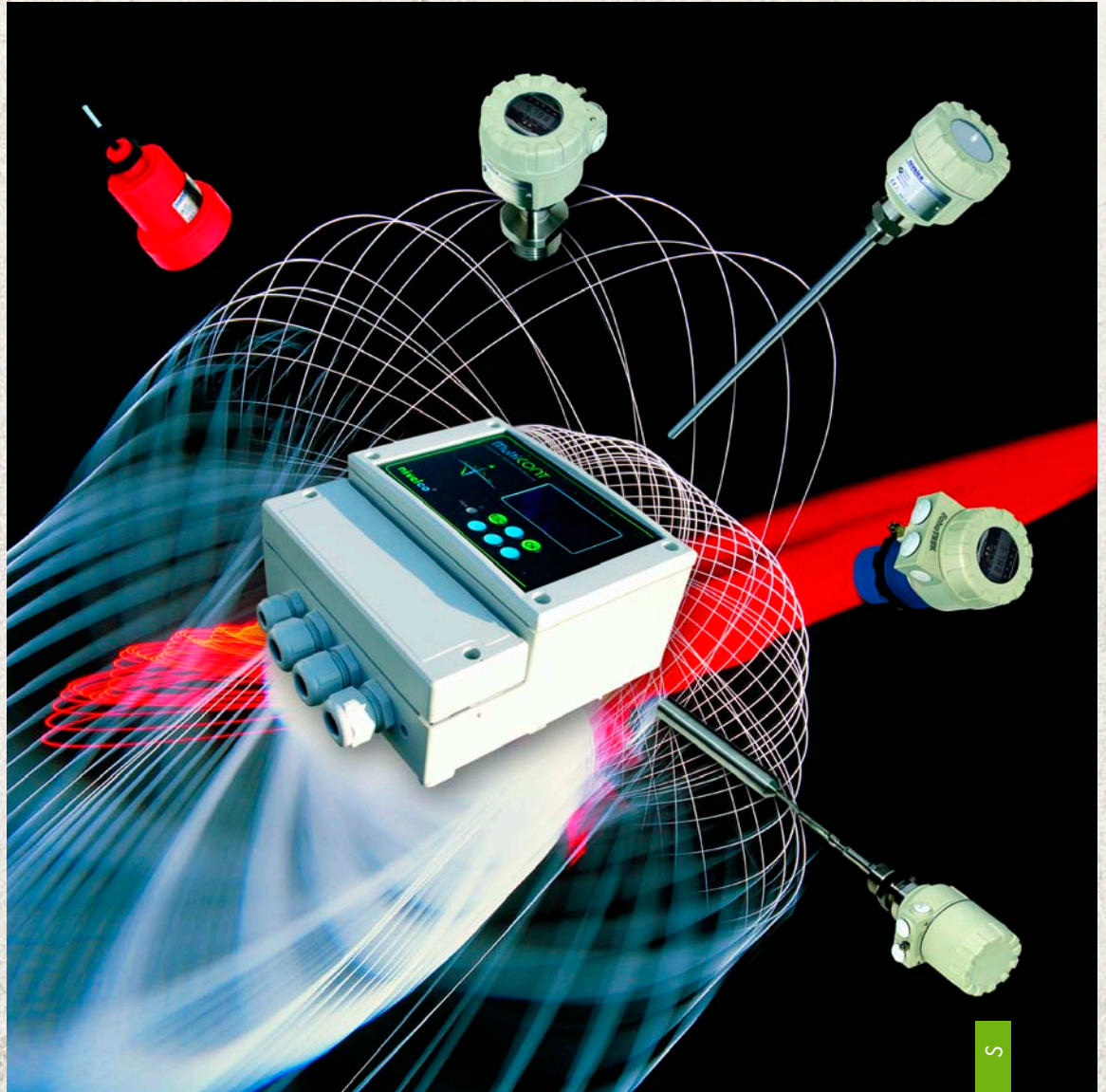




# MULTICONT

MULTICHANNEL PROCESS CONTROLLER



OUR PROFESSION IS YOUR LEVEL

S Y S T E M S

## APPLICATION

The **MULTICONT** is a universal interface between Nivelco's HART-capable intelligent level transmitters and other elements of the process control system like PC-s, PLC-s, displays and actuators. **MULTICONT** receives digital data from the transmitters using HART protocol, processes, displays and, if needed, re-transmits them. The device is capable to act as independent controller. With the help of the RS485 communication line (User RS485) **MULTICONT** can be connected to other process control devices and solve complex control tasks. The device provides power supply for 2-wire transmitters while 4-wire transmitters need to be powered by an external source. Max. 15 standard and 4 Ex-version HART capable transmitters can be connected to one **MULTICONT**. Programming of Nivelco transmitters and displaying measured data is also possible. Measured values and values calculated from the measured ones can control different outputs such as 4...20 mA, relay and digital. The internal current outputs (max. 2 pcs.) of the **MULTICONT** can transfer and even modify information supplied by the transmitters. The built-in relays (max. 4 pcs.) can be freely programmed and assigned to the transmitters. If a system contains more transmitters than one **MULTICONT** can handle, further **MULTICONT** units can be organised in chain via RS485 interface. The large dot-matrix display allows visualisation of a wide range of informative display functions. One special feature is the "Echo-Map" visualisation when communicating with NIVELCO's EchoTREK and EasyTREK transmitters.

## MAIN FEATURES

**MULTICONT** is optimal for users having a system of a large number of transmitters to be operated at low cost without using a PLC.

- As a Universal Process Controller provides for a flexible solution for commissioning a process control system consisting of any HART-based intelligent (level, temperature or pressure) transmitters
- Simple 6-key programming
- 1 to 15 (standard) or 1 to 4 (Ex) channels
- Highly informative large dot-matrix display (128x64 pixels)
- Ex ia model is available
- Galvanically isolated 4...20 mA outputs for transmitters
- Expandable with Universal Interface Modules (UNICONT PJK) via RS485 interface
- Echo Map for EchoTREK and EasyTREK ultrasonic transmitters

## OTHER FEATURES

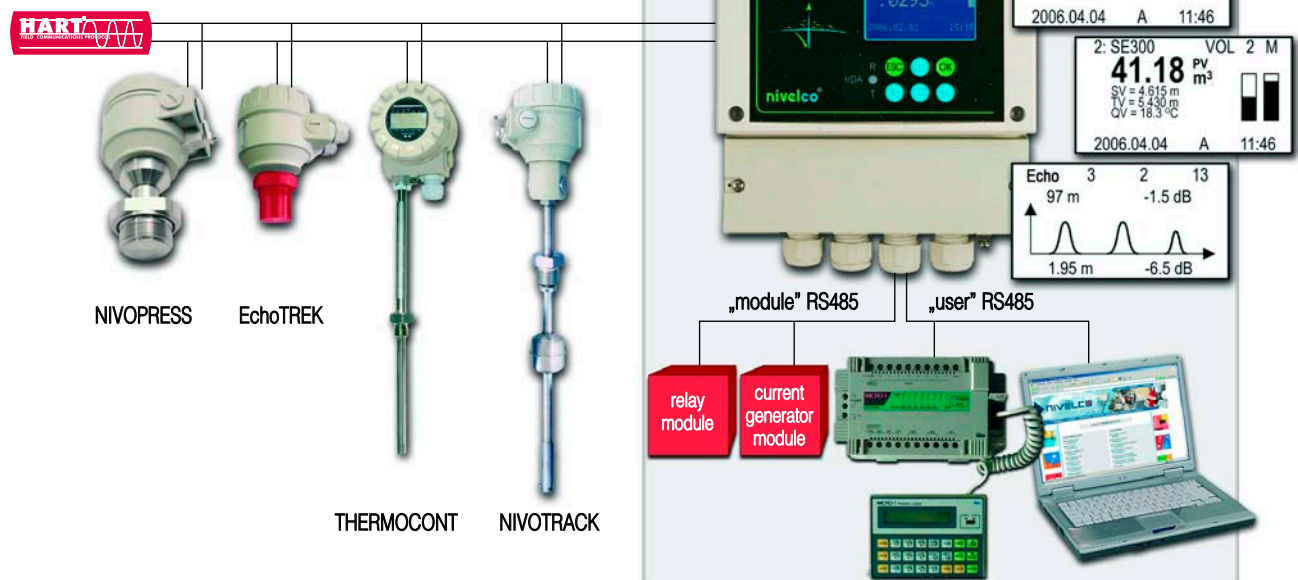
### Infrared (IrDA) port

The built-in IrDA communication port of the device allows upgrading or modifying the operating software (firmware). This is useful if some technical features of the device are improved during a latter development so the user can benefit from the new features. To complete the upgrade the user needs a PC and a commercial IrDA adapter connected to it.


### NIVISION Process Visualisation Software (optional)

The **NIVISION** software running on a PC operating under Windows is capable of visualizing a process measured by Nivelco's transmitters. Linking the **MULTICONT** to the PC is done via a dedicated serial port (user RS485). The **Nivision** performs data logging, trend monitoring, database handling and various other tasks in addition to a basic visualization. The software is sold as a custom-tailored product.

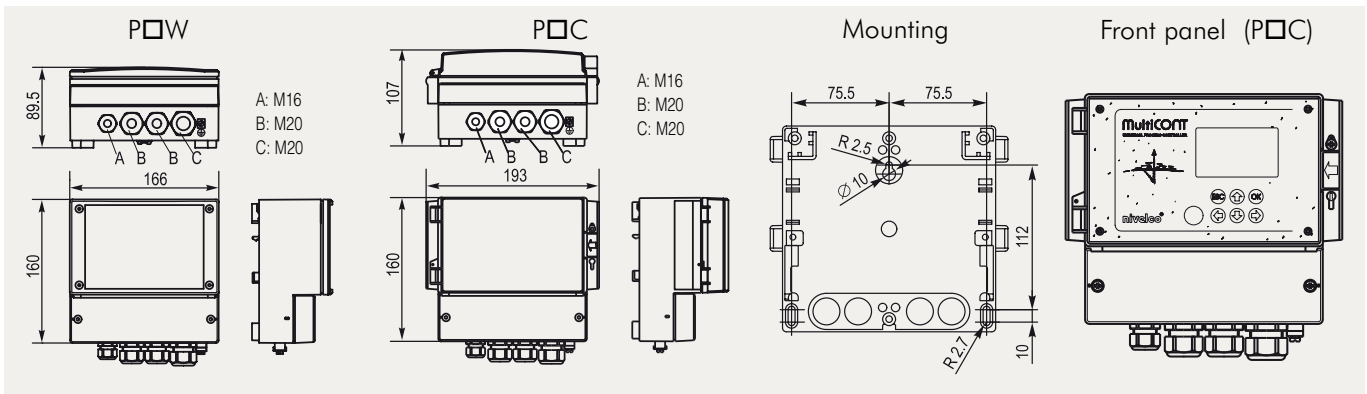
## TYPICAL NETWORK CONTROLLED BY MULTICONT



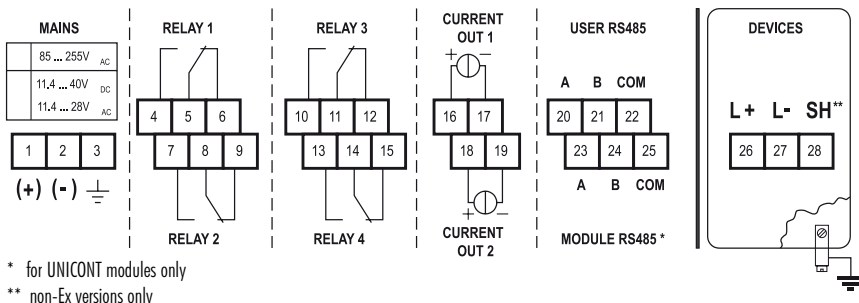
## TECHNICAL DATA

TYPE		P □ □ - 1 □ □ - □
Power supply / Consumption		85 ... 255 V AC 50 ... 60 Hz / 12 VA, or 11,4 ... 40 V DC / 11 W; 11,4 ... 28 V AC 50 ... 60 Hz / 12 VA
Transmitter power supply		30 V DC / 60 mA (for Ex version: 25 VDC / 22 mA)
Display		128 x 64 dotmatrix with backlight
Relay output		max. 4 x (SPDT) 250 V AC, 5 A, AC1
Analogue output		Max. 2x, 4 ... 20 mA, galvanically isolated max load 500 ohm, over-voltage protection
Number of transmitters to be powered		max. 15 standard or max 4 Ex transmitters
RS 485 interface	"user"	Galvanically isolated, HART and MODBUS protocol
	"module"	Galvanically isolated, HART protocol
Mounting		Wall mounting, DIN-rail mounting
Housing material		Polycarbonate (PC)
Ingress protection		IP 65
Electrical protection		Class I / III
Ex marking		ATEX  II (1) G [EEx ia] IIB
Ambient temperature		-20 °C ... +50 °C
Mass		0.9 kg

## DIMENSIONS



## ELECTRICAL CONNECTION



After loosening screws and removing cover of the wiring terminal the cables can be connected. Separate cable is to be used for AC and DC as well as different cables should be applied for SELV and mains voltage.

For wiring of the transmitters shielded, twisted cable pair (STP) should be used with length depending on number of units and technical data of cable (see table for cable capacity).

RS485 interface: A: TRD+  
B: TRD-  
COM: shielding

The grounding of the STP wire of transmitters should be connected to the internal or external grounding screw.

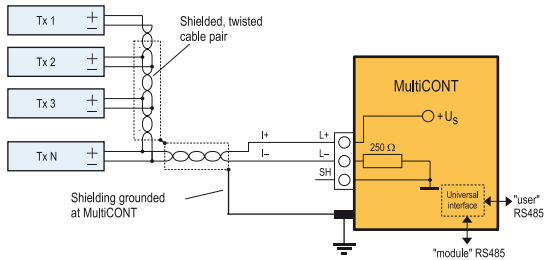
Number of transmitters	Length of cable (m)			
	65 pF/m	95 pF/m	160 pF/m	225 pF/m
1	2800	2000	1300	1000
5	2500	1800	1100	900
10	2200	1600	1000	800
15	1900	1400	900	700

\* for UNICONT modules only  
\*\* non-Ex versions only

## SYSTEM SET-UP

There is a Master-Slave relation between **MULTICONT** and the connected transmitters. Through the **MULTICONT** the transmitters can be programmed or their parameters checked and modified. Reading the process values of the transmitters is easy to do by the **MULTICONT**. In case of using **MULTICONT** with multiple transmitters, the units should be addressed with numbers (Short address) differing from zero. Using two transmitters with the same Short address is not possible. **MULTICONT** can handle a number of max. 15 transmitters with HART communication. When using 2-wire transmitters, the current output of the transmitters will be limited to 4 mA, because of the capacity of the **MULTICONT**'s power supply, which is rated at 60 mA with standard transmitters.

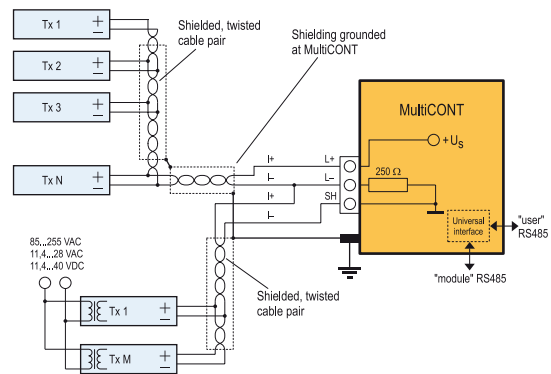
### Wiring of 2-wire transmitters



#### 2-wire transmitters made by NIVELCO:

- EchoTREK / EasyTREK 2-wire ultrasonic level transmitter
- NIVOTRACK magnetostrictive level transmitter
- NIVOCAP capacitive level transmitter
- NIVOPRESS hydrostatic level transmitter
- THERMOCONT temperature transmitter

### Wiring of a combined system (containing 2- and 4-wire transmitters)

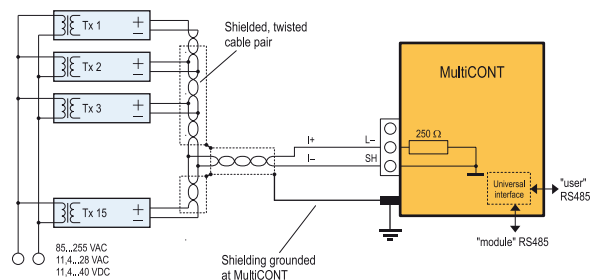


- MicroTREK microwave TDR level transmitter (only for querying measured data)
- PiloTREK 2-wire microwave level transmitter (only for querying measured data)

### Wiring of 4-wire transmitters

#### 4-wire transmitters made by NIVELCO:

- EchoTREK ultrasonic level transmitter
- EasyTREK ultrasonic level transmitter
- PiloTREK microwave level transmitter (only for querying measured data)

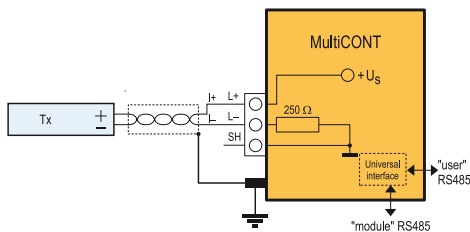


## COMMUNICATION BETWEEN MULTICONT AND TRANSMITTERS

**MULTICONT** uses a standard Master-Slave type HART communication, where **MULTICONT** is the Master and the transmitters are Slave devices.

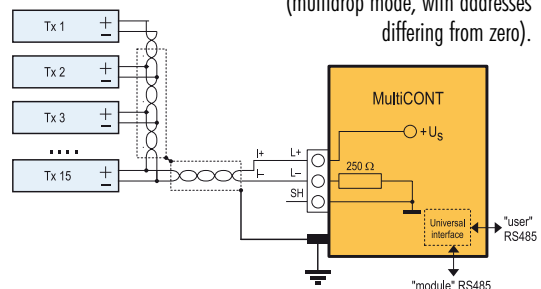
### Point-to-point connection

With using a master (**MULTICONT**) and one slave in a system, a point-to-point connection is established.



### Multidrop connection (more slave devices in parallel connection)

Using this type of connection, the current outputs of the transmitters are automatically set to 4 mA (multidrop mode, with addresses differing from zero).



## PROGRAMMING OF MULTICONT

During programming the following operations can be performed:

- Automatic detection and listing the selected devices (transmitters) connected to the **MULTICONT**
- Activation, inactivation of devices (transmitters)
- All devices in the system can measure irrespective of whether they are being listed or not. The listed devices will automatically be activated since **MULTICONT** will query the active transmitters only and not the inactive ones. Devices to be temporarily out of use for any reason can be switched off by inactivation
- Activation, inactivation of relays and current generators, and their assignment to devices (transmitters)
- Setting composition of functional values (difference, sum or average of two measurement values)
- Remote programming of devices. Programming of devices is suggested to be performed prior to installation
- Programming the outputs of **MULTICONT**

## PUTTING A NETWORK INTO OPERATION WITH MULTICONT

- **Preparing transmitters and universal interface modules**  
Transmitters should be given a "Short address". For multiple transmitters, this should not be zero (0)
- **Detecting and registering devices in the loop**
- **Setting the status of the transmitters**  
The detected transmitters appear with active status, and MULTICONT keeps querying their results  
This could be suspended by marking the device as inactive
- **Detecting Universal Interface Modules**  
The detected modules (relays, current generators) are taken as inactive devices, so MULTICONT will not operate them
- **Relay configuration**  
The relay is to be assigned to transmitter(s) (source), its operation mode is to be selected, the switching points (parameters RP1...RP3) are to be set and finally the relay is to be activated
- **Programming of current generators**  
First a transmitter (source) should be assigned to a current generator and then setting of the operation mode (function) and parameters is needed

## UNICONT UNIVERSAL INTERFACE MODULES

### APPLICATION

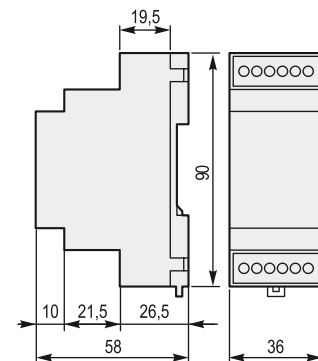
If the number of the built-in relays or current generators is not enough, MULTICONT can be extended with external modules using the "module" RS485 interface. The sum of relays in UNICONT PJK-100 extension modules and MULTICONT must not exceed 64, the sum of analogue outputs (4...20mA) must not exceed 16. There is a universal module with both relay and current output in the variety of the UNICONT PJK series. Max. number of these modules may be 32. Programming of the modules is done by MULTICONT. The DIP switch in the front panel of the module is for setting the address.

### TECHNICAL DATA

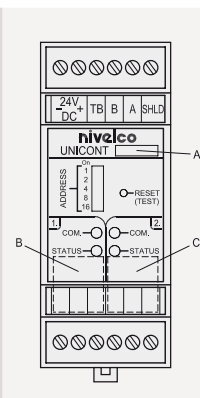
#### GENERAL DATA









TYPE	PJK - 1□□ - 4
Power Supply	24 V DC ±10%
Power consumption	(10 mA + N <sub>relay</sub> x 11 mA + N <sub>current-gen</sub> x 25 mA) ±10%
Ambient temperature	-20 °C ... +50 °C
Electrical connection	max. 2,5 mm <sup>2</sup> twisted or max. 4 mm <sup>2</sup> solid cable
Electrical protection	Class III.
Mechanical connection	DIN EN 60715 rail
Ingress protection	IP 20
Mass	0.11 kg

#### DIMENSIONS



#### TYPE SPECIFIC DATA



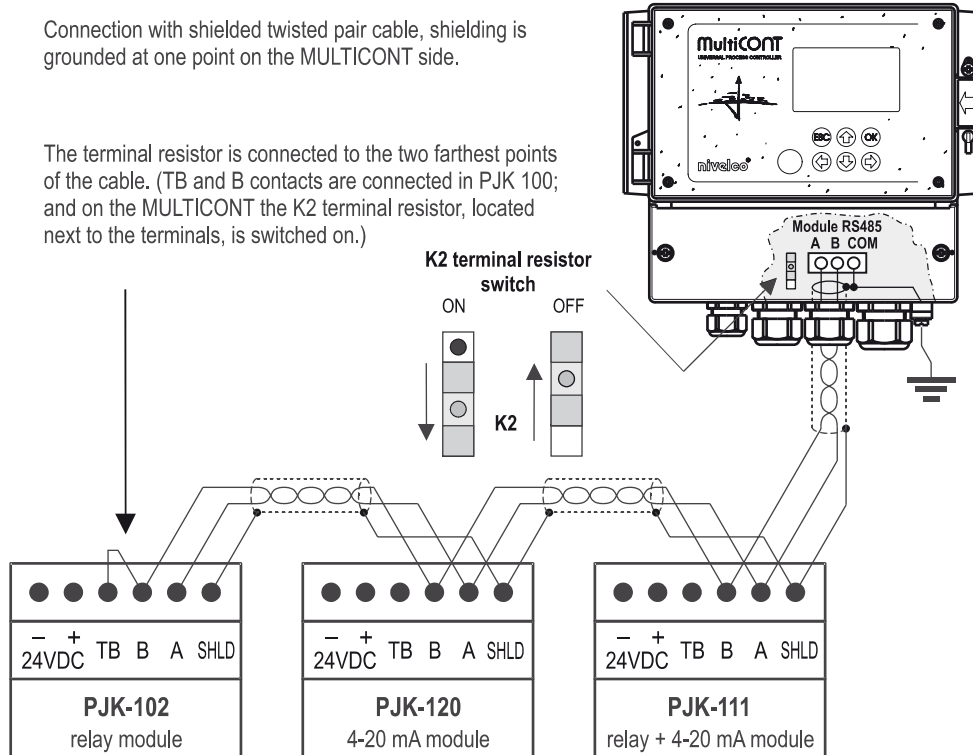
TYPE	PJK-102-4		PJK-111-4		PJK-110-4		PJK-120-4			
	B	C	B	C	B	C	B	C		
Relay	Output units		 		 		 		 	
	Output		1 x SPDT		-		-		-	
	Rating		250 V AC, 8 A, AC1		-		-		-	
	Insulation voltage		2500 V 50 Hz		-		-		-	
	Electrical / Mechanical life		10 <sup>5</sup> / 2 x 10 <sup>6</sup> switches		-		-		-	
	Pulse width in pulse mode		0.1 ... 25.5 s		-		-		-	
Electrical protection		Class II.		-		-		-		
Current generator	Linear range		-		3.601 mA ... 21.999 mA		-		-	
	Error indication		-		≤ 3.6 mA, or ≥ 22 mA		-		-	
	Resolution		-		14 bit		-		-	
	Accuracy		-		40 μA		-		-	
	Temperature dependence		-		max. 15 μA / 10 °C		-		-	

## CONNECTION EXAMPLE FOR USE WITH MULTICONT

**MULTICONT** can be extended with max. 32 **UNICONT** Universal Interface Modules. These modules should be distinguished with different Short Addresses. A system can not contain two or more modules with the same Short Addresses. Setting is possible with the DIP switch on the front panel of the module (0...31).

Connection with shielded twisted pair cable, shielding is grounded at one point on the MULTICONT side.

The terminal resistor is connected to the two farthest points of the cable. (TB and B contacts are connected in PJK 100; and on the MULTICONT the K2 terminal resistor, located next to the terminals, is switched on.)



## ORDER CODE

**MULTICONT P ■ ■ -1 ■ ■ - ■ ■**

Extension	Code	Enclosure	Code	Power supply / Ex	Code	Output	Code
Standard	E	IP 65	W	85 ... 255 V AC / none	1	Display only	0
Expandable *	R	IP 65 with transp. cover	C	12 ... 40 V DC / none	2	Display + 1 relay	1
				12 ... 28 V AC / none	2	Display + 2 relay	2
				85 ... 255 V AC Ex	5	Display + 3 relay	3
				12 ... 40 V DC / Ex	6	Display + 4 relay	4
				12 ... 28 V AC / Ex	6	Display + 1 relay + 1 x 4...20 mA	5
						Display + 2 relay + 1 x 4...20 mA	6
						Display + 3 relay + 1 x 4...20 mA	7
						Display + 4 relay + 1 x 4...20 mA	8
						Display + 1 relay + 2 x 4...20 mA	9
						Display + RS485 interf.	A
						Display + RS485 interf. + 1 x 4...20 mA	B
						Display + RS485 interf. + 2 relay + 1 x 4...20 mA	C

\* Expandable with relay, analogue and combined modules

**UNICONT PJK-1 ■ ■ -4**

Current generator	Code	Relay	Code
-	0	-	0
1 x 4 ... 20 mA	1	1 x SPDT	1
2 x 4 ... 20 mA	2	2 x SPDT	2

Input	Code
1 tx with HART	1
2 tx with HART	2
4 tx with HART	4
8 tx with HART	8
16 tx with HART	M