

Universal Control Unit MUL..2.. / MUL..4..

This programming and installation advice does include all necessary information and technical support for a successful and secure function instant of the electronic transmitter above mentioned.

Validity for the follow types:

- MULD21 2 Relay; Current output 0 / 4...20 mA; Power supply 18 ... 36 VDC
- MULD22 2 Relay; Current output 0 / 4...20 mA; Power supply 115 VAC
- MULD23 2 Relay; Current output 0 / 4...20 mA; Power supply 230 VAC
- MULD41 4 Relay; Current output 0 / 4...20 mA; Power supply 18 ... 36 VDC
- MULD42 4 Relay; Current output 0 / 4...20 mA; Power supply 115 VAC
- MULD43 4 Relay; Current output 0 / 4...20 mA; Power supply 230 VAC

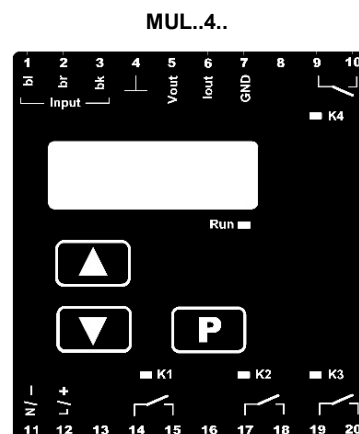
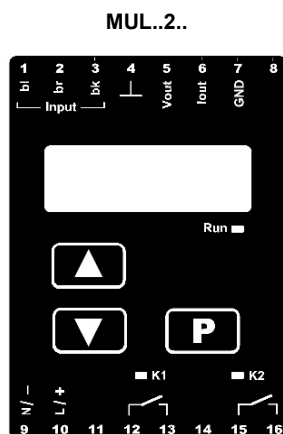
- MULE21 2 Relay; Current output 0 / 4...20 mA; Power supply 18 ... 36 VDC; with linearization
- MULE22 2 Relay; Current output 0 / 4...20 mA; Power supply 115 VAC; with linearization
- MULE23 2 Relay; Current output 0 / 4...20 mA; Power supply 230 VAC; with linearization
- MULE41 4 Relay; Current output 0 / 4...20 mA; Power supply 18 ... 36 VDC; with linearization
- MULE42 4 Relay; Current output 0 / 4...20 mA; Power supply 115 VAC; with linearization
- MULE43 4 Relay; Current output 0 / 4...20 mA; Power supply 230 VAC; with linearization

Technical information

Ambient:	Temperature range 0 ... 55°C Protection IP 40 (connections IP 20) Altitude max. 2000 m
Power supply	Variations 230 VAC ±10%; 115 VAC ±10% Variation 18 ... 36 VDC
Input signal:	1...100 kΩ, 3-wire, shielded, max. input cable length < 40 m
Output signal:	0 ... 20mA or 4 ... 20mA; load max. 400 Ω; max. output cable length < 200 m
Relay Outputs:	Normally open 230 VAC / 2A
Housing:	ABS, grey, B 45 / 55 mm x H 75 mm x T 110 mm
Connection size for cable:	Wire max. 2.5 mm ²

Safety advices

- Sensor cable and single isolated power supply wires are no to place in the same cable channel





INSTALLATION AND OPERATING INSTRUCTIONS



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1 Description

The universal transmitter MULD does transform a 3-wire potentiometer signal into a norm-signal 0...20 mA or 4...20 mA. The 4-digit LED indicator is programmed by standard configuration 0 ... 100 %, accuracy 0.1 %. The local indicated value, also the set points are free adjustable. There are 2 or 4 relay set points existing on those a output relay will be switched. A typical application: pump control system with high and low level alarm indication.

The unit shows by a broken-wire failure the follow indications:

- Interruption on screwed connection 1 (bl): Display shows the min. value
- Interruption on screwed connection 2 (br): Display shows the min. value and is blinking
- Interruption on screwed connection 3 (bk): Display shows the max. value

The unit shows by a broken-wire failure the follow indications ([only on instruments with version 01 or later](#)):

- Interruption on screwed connection 1 (bl): Display shows the max. value - blinking
- Interruption on screwed connection 2 (br): Display shows the middle value - blinking
- Interruption on screwed connection 3 (bk): Display shows the max. value - blinking

On any broken wire detection output signal will be 3.5mA (if the output signal has been programmed in code 131 for min. value of 0.0mA or 0.0V DC then this function can be not used).

The transmitter type MULE has an additional option for a possible linearization. This can be for example used by cylindrical tank forms or special customised tank forms. This optional linearization (with 16 linearization fix points between 0 ... 100 %. The final signal will be an interpolated linear output signal) is free programmable and free adjustable for any tank forms (according to part: configuration).

2 Mounting and installation advices

2.1 Connection

- Has to be connected according to the diagram mentioned on each panel (according to: technical information).
- The connections 1,2 and 3 are to be used or the connection of the 3-wire input signal. By long distances or the possibility of an influence thru other cables, a shielded cable is to use. The shield has to be connected to PE (preferred).
- Connection 4 has an internal GND potential.



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2.2 Configuration

Switch on the power supply and push at the same time the bottom „▼“ and „P“. After indication of software name and version it appears code „C100“. With the bottoms „▲“ and „▼“ select your code and confirm with „P“. During the time of configuration the transmitter is not active.

Adjustable code range: 100...139.

Code 100:	Leaving configurations area
Code 104:	Programming protection on
Code 105:	Programming protection off
Code 122:	Standard parameter new loading (display 1 sec: „Ld_S“)
Code 123:	----
Code 130:	Parameter adjustments for input signal (only MULE)
Code 131:	Parameter adjustments for display and output signal
Code 132:	Parameter adjustments set-point relays

Change with bottoms „▲“ and „▼“ parameter-value and confirm with „P“. The indicated value with the bottoms „▲“ and „▼“ changeable. A changed value is always blinking. The bottom „P“ confirms the new entered value and moves automatically to the next parameter. Leaving and store the parameter table: Push bottom „P“ for 3 sec. constantly. It appears again the table code.

Table Code 130:

Parameter	Indication	Value	Norm	Standard	Notes
With linearization curve Input signal	Linr	0/1	-	0	0: linear 1: non linear
Table range non linear	i 0.0 i 6.3 i 12.5 ... i 50 ... i100	0...100.0 (full table)	%	0.0 2.6 7.2 ... 50.0 ... 100.0	Standard table for lying cylindrical tank (The table only appears on Linr = 1)

Table Code 131:

Parameter	Indication	Value	Norm	Standard	Notes
Decimal point indication (by normal function)	didP	0/1/2/3	-	1	0: XXXX 1: XXX.X 2: XX.XX 3: X.XXX
Begin of indicated value	diLo	-999...9999	-	0.0	
End of indicated value	diHi	-999...9999	-	100.0	
Begin of indicated output	AnLo	-999...9999	-	[d-LO]	Related to indicated value
End of indicated output	AnHi	-999...9999	-	[d-HI]	
Output signal	AnSE	0/1/2	-	0	0: 0...20mA 1: 4...20mA 2: 0...10V

Table Code 132:

Parameter	Indication	Value	Norm	Standard	Note
Polarisation relay K1 (set point 1, down)	Pol1	0/1/2	-	1	0: relay not active 1: relay on by S > G * 2: relay off by S > G *
Polarisation relay K2	Pol2	0/1/2	-	1	(according to K1)
Polarisation relay K3	Pol3	0/1/2	-	1	(according to K1)
Polarisation relay K4	Pol4	0/1/2	-	1	(according to K1)

* S > G: Signal on input bigger the switch point



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3 Normal function

The working LED is lighting. By normal function the unit shows the actual value measured in the tank according to programmed values. The condition of the relays is showed by a LED indication.

Programmed switch points can be visual controlled by pushing the bottom "▲". The set points will be indicated with 1, 2, 3, ...

By the same time the selected relay LED blinks. Without pushing any bottom by 5 sec. the unit goes back to normal program run.

4 Programming Set point relays

The programming of the set points will be done out of the normal function without activated programming-protection.

Depending on version of each unit there can be programmed 2 or 4 relays with hysteresis. A short push on the bottom "P" gets into the programming modus. Select the requested parameter by with the arrows „▲“ or „▼“ and confirm with the bottom "P".

The indicated value is to change with the bottoms „▲“ and „▼“. A changed value is always blinking. The bottom "P" confirms the new entered value and steps to the next one. Changed values are immediately active after change conformation "P".

Five seconds after last push of a bottom the program does switch back to normal function. All changed parameters are stored permanently.

Parameter	Indication	Value	Norm	Standard	Notes
Switch-point 1	L1	-999...9999		10.0 / 10.0	Switch-point down (beginning)
Hysteresis 1	H1	0...99	%	1 / 1	
Switch-point 2	L2	-999...9999		90.0 / 25.0	Switch-point top (Relay)
Hysteresis 2	H2	0...99	%	1 / 1	
Switch-point 3	L3	-999...9999		-- / 75.0	
Hysteresis 3	H3	0...99	%	-- / 1	
Switch-point 4	L4	-999...9999		-- / 90.0	Switch-point top (4 Relay)
Hysteresis 4	H4	0...99	%	-- / 1	

Notes:

- The **Switch-point** is a free selectable number with free selectable decimal point positioning. The decimal point position will be programmed in the configurations menu.

- The **Hysteresis** is in % related to the output signal / LED indication. The hysteresis is divided symmetric by the set-point value (for example. programming 4 % -> Hysteresis = ± 2 %)