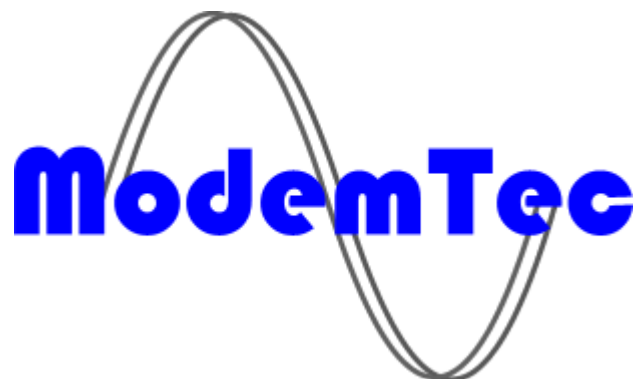


Technical description

MT25-X



PANEL DESCRIPTION AND SIZE



The equipment makes a set of two basic modules – PS and MT21-1x PS link module and MT25-X status module. Just this setup is safe from point of electrical hazard. Therefore do not use other power supplies or circuits than mentioned in this direction.

The equipment is continuously powered from 230V/50Hz network. From this reason any manipulation with the cabinet, leads or parts inside requires extensive care and can be executed just by an authorized person (§6).

The equipment is sufficiently covered just in an IP65 installation box against water and high humidity. (IP65 – dust proof, jetting water resistant).

Do not place the equipment necessarily in close vicinity of heat sources (heat guns, hot air equipment, etc.).



The equipment will work reliably just in an environment given in this service manual. Any unruly changes of operation and servicing can cause equipment function deterioration or destruction.

GENERAL INSTRUCTIONS – GENERAL DESCRIPTION

It is intended for logic states transition in a pair mode with MT25-Y (4 channels of relay outputs) or in a network mode, (with MT23-S, MT24 etc.) within LV 230V 50Hz power network. Module MT25-X, having 4 logic inputs with a provision of connection of +5VDC to +30VDC control voltage or ~230V 50Hz. All inputs are galvanically isolated by optrons with 5kV isolation voltage. In the pair mode the MT25-X module transmits a message to the opposite MT25-Y module immediately after a change of any input. In the network mode the module must be addressed by a supervising system.

Operation state

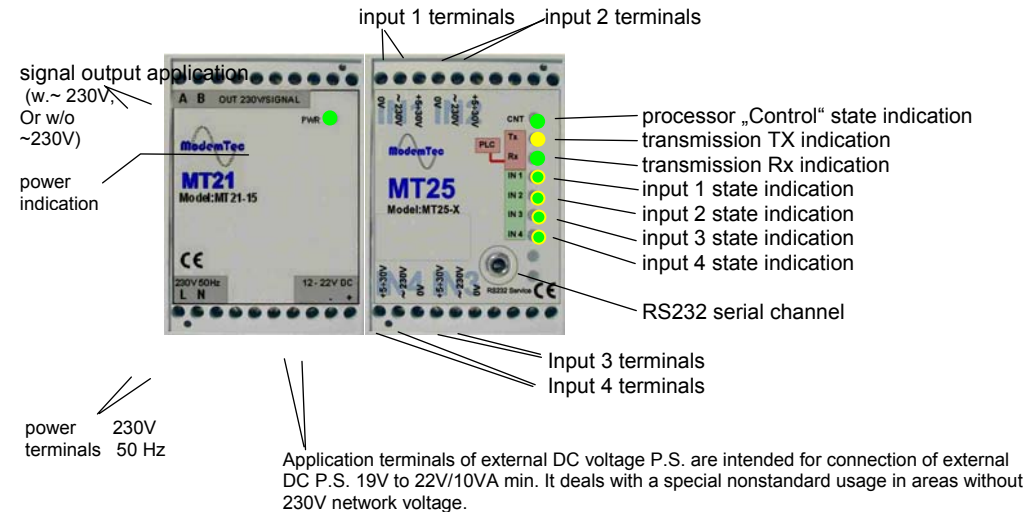
It is a basic function of the equipment. In this state the equipment tracks input logic levels, it transfers their change to a pair replicator over ~230V power network or supervising system when addressed. In the network mode it is necessary to keep the time length of input level min. within two periods of module addressing (e.g. when the time of addressing is 0,5sec, the input level must be maintained at least within 1 sec. period of time).

Programming state

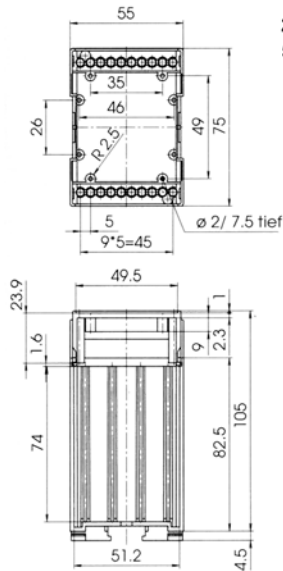
It is a state in which equipment parameters are set-up. This can be reached by two ways. The first way is a computer connection via serial port right to the converter module and its direct programming. The other one is a remote programming by means of data transfer over 230V network from control station (MT23). You can find the necessary instructions in communication protocols description.

PANEL DESCRIPTION AND ITS SIZE

The equipment is embedded inside of Bopla CN 55 AK boxes enabling attachment on DIN35 strip.



Bopla CN 55 AK:
mat.: ABS



Description of indication elements:

Power indication – indication of MT21-1x connection to 230V network and 19VDC output voltage presence

Processor „Control“ state indication – CPU motherboard state indication, when lit – system is OK

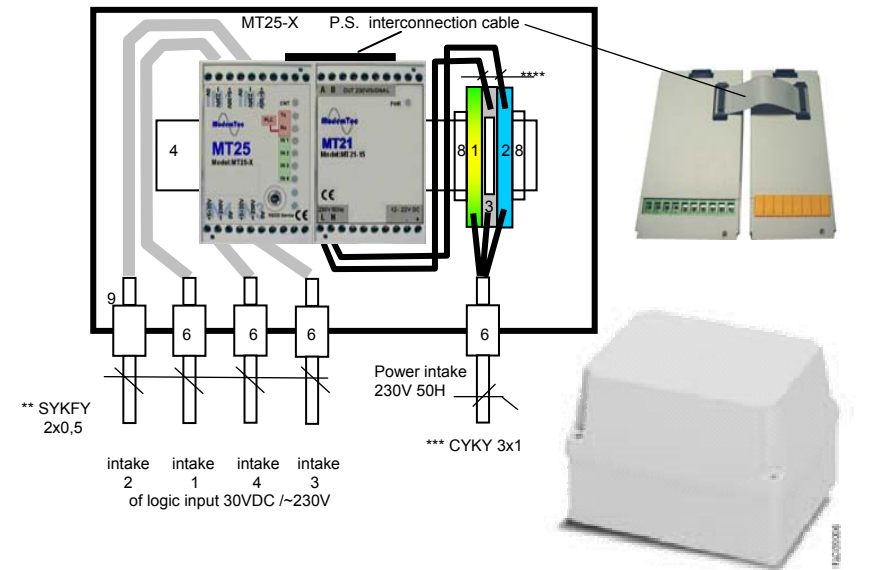
Tx transmission indication – indicates a state of transmission from processor toward MT21-1x source unit power amplifier – when lit the transmission is active

Rx reception indication – indicates a state of reception toward processor from MT21-1x PS front-end amplifier – when lit the reception is active

1 to 4 inputs indication – indication of logic inputs logic state, it means when some of inputs is active (log.1)-a voltage is connected to the input, an appropriate LED lights. When the input is inactive, the LED does not light.

POWER CONNECTION

Electrical installation design:



1 – WAGO 280-607 protection terminal + 280-331 terminal

2 – blue terminal WAGO 280-602

3 – gray terminal WAGO 280-612 with a disconnector or eventually 281-511 fuse holder

4 – DIN 35 stripe (as per the box length)

6 – OBO V-TEC Pg 7 cable bushings or side box wall tight opening usage

8 – WAGO 246-116 DIN 35 strip end shoe

9 – ABB 00 860 box with a high cover, IP55 protection or ABB 12 808 with IP65 protection

* - power lead CYKY 2 x 0,75 (no current load, insulation necessary)

** - power lead accordingly what breaker protects an intake

*** - power lead as per which breaker is used for intake

fuse, breaker 6A – wire 3x1

fuse, breaker 10A – wire 3x1,5

fuse, breaker 16A – wire 3x2,5

**** - use one of power cable wires

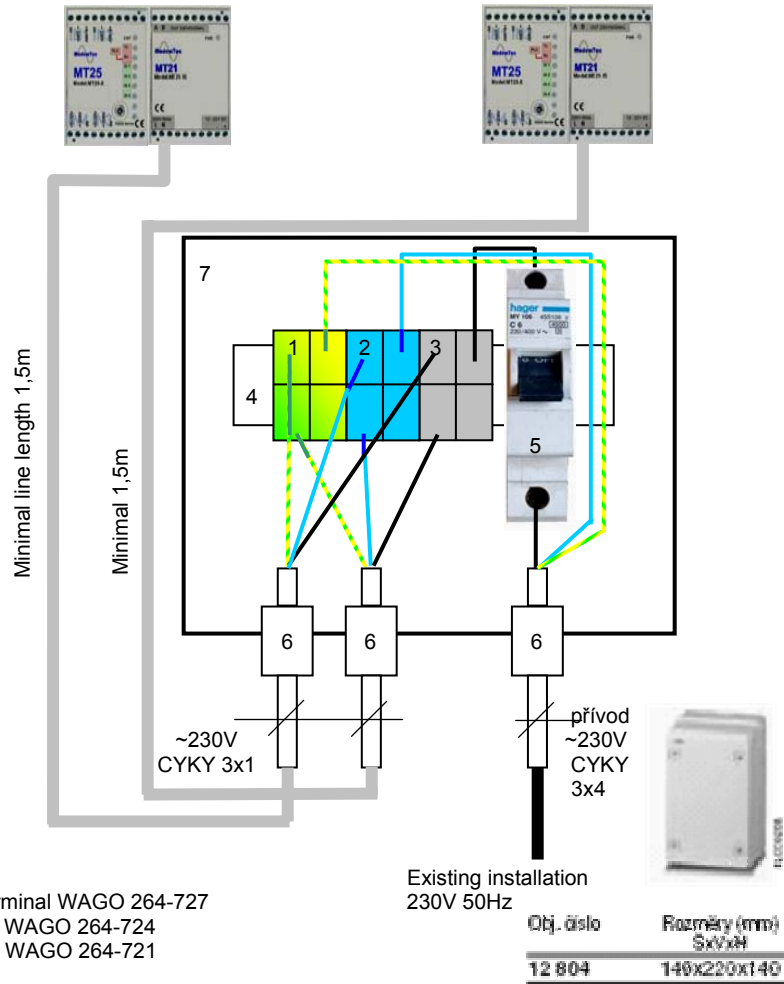
Similar elements of other manufacturers with equivalent parameters can be used.

MT21-1x power supply location in respect of MT25-X module is optional from the point of interaction. Interconnection between MT25-X module and MT21-1x power supply is realized by means of a flat cable.

Obj. číslo	Vnitřní rozměry (mm)	Srouby	Balící jednotka/balení ks
00 860	160x135x150	ocelové	1/16

BINARY INPUTS CONNECTION

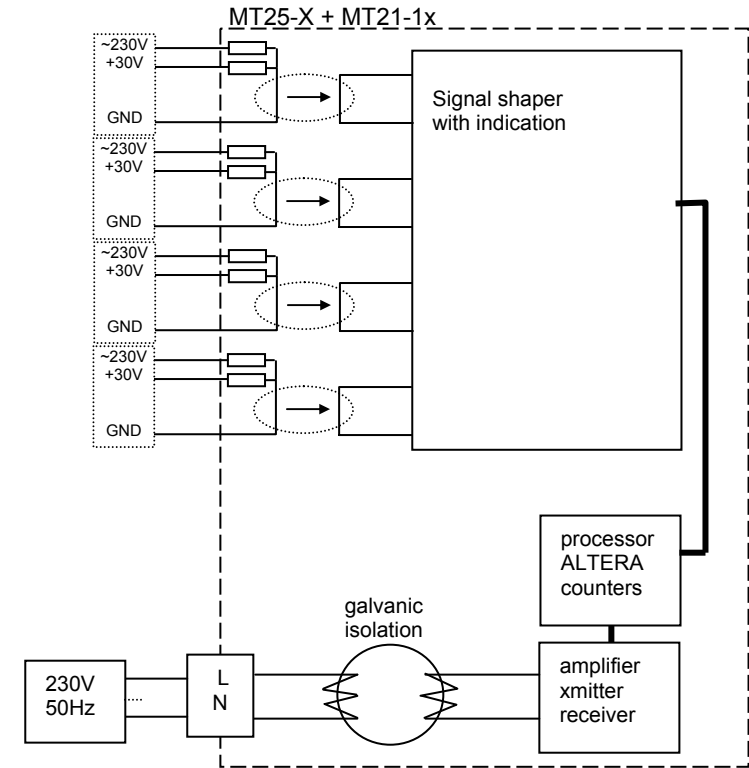
Design of MT25-X modules group electrical installation in vicinity of one power node:



- 1 – protection terminal WAGO 264-727
- 2 – blue terminal WAGO 264-724
- 3 – gray terminal WAGO 264-721
- 4 – DIN 35 stripe
- 5 – 6A (HAGER MY106 C6) breaker
- 6 – OBO V-TEC Pg 7 cable bushings or side box wall tight opening usage
- 7 – ABB 12 804 box, IP65 protection, w x h x d (140 x 220 x 140)

Similar elements of other manufacturers with equivalent parameters can be used.

During individual modules connection to the 230V distribution network principles of using wires of certain minimal cross-section with regard to used line wires must be followed. An impedance loop of breaker reliable cut-off by a short circuit current must not be changed. Otherwise the onwards line must be fused by a new breaker with an appropriate cut-off current (see the picture).
fuse, breaker 10A – wire 3x1,5, fuse, breaker 16A – wire 3x2,5



Logic inputs are optically isolated from evaluation and transmitter module section.

Attention, the specified maximal voltage of an appropriate input must be observed.

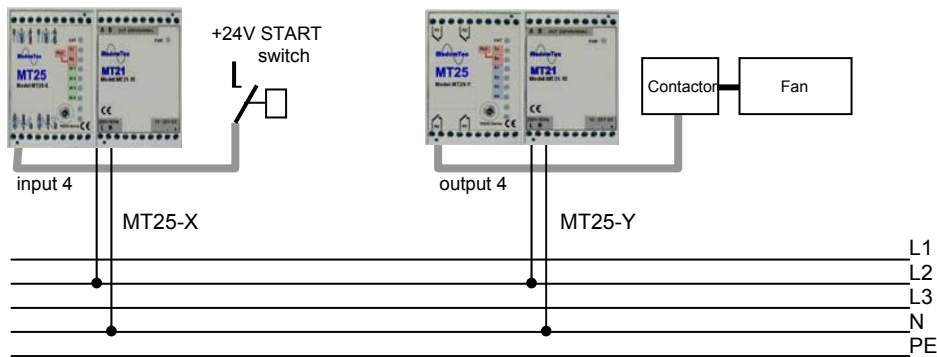
Inputs are designed for continual connection of maximal control voltage. Galvanic isolation complies with 5 kV safety voltage.

PROGRAMMING STATE

Proper PLC MT25-X module setup must be done before its use. This is done by means of „SEMODO“ program which is not a part of supply. Detailed information can be found in SEMOD instruction manual.

PAIR MODE PRINCIPLE

In this mode just two modules can communicate together, the best connected to the same phase. At connection on different phases the communication cannot run safely enough, not at all in the worst case.

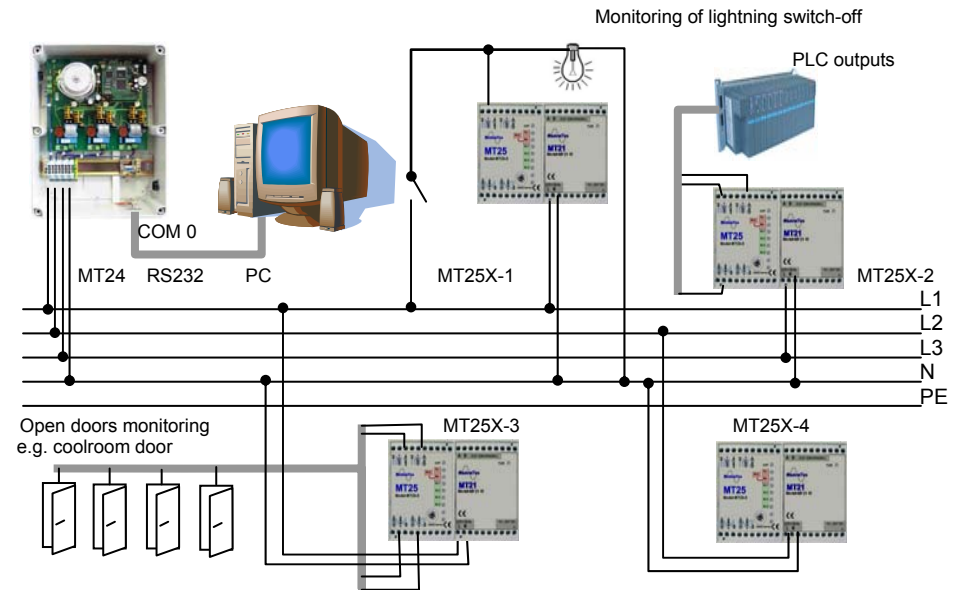


System is used for information transition from MT25-X input side toward MT25-Y output side while the input relay logic can be stopped when needed. At the communication break-up during a time longer than so called set-up refresh time the relay will switch-on (off) according a set-up parameter (emergency conditions). Input level must be static, it means this level is transferred toward input side during each change. In this example a permanent START switch switch-on will actuate a fan. Its switch-off will stop the fan. A thermometer with hysteresis can be connected instead of the switch that can actuate the fan at set-up temperature overshoot.

Warning:

Just one pair on a set up transmission frequency can be operated within a circuit of one distribution transformer in this mode. When several pairs should be operated (maximum 3 pairs) then each pair must use different transmission frequency. Frequencies in the range of 95kHz to 145kHz can be used. Manufacturer sets the frequency up according to customer requirement.

Using a three-phase MT24 module in master system with PC.



The network mode has been designed mainly for tracking and registration of input levels in real time. Various alarms with adjustable parameters can be used. Actually all can be tracked and controlled with help of mechanical contacts (micro switches, reed relay, etc.) or voltage levels in range of 5 to 30VDC, or 230VAC. To actuate four MT25-X an external auxiliary voltage of 5 to 30VDC / 50mA must be used when using mechanical contacts. It is necessary to say that input state must survive minimally two address periods per individual module. The address period duration is adjustable and depends on quantity of modules tracked. It is set-up as a parameter in MT23 master module or MT24 inputs in this example. Instead of MT24 module an MT23 one can be used which is a single-phase one, however. At this alternation a fact must be taken in account that the communication will properly carried just a phase used, no communication will be assured along other two phases.

OPERATION ERRORS

Various module error conditions can arise during operation. Further described are some of basic error conditions with the solution how to get rid of the error.

No.	Indication LED status	Malfunction description	Malfunction elimination
1	no LED is lit	No power on module	<ul style="list-style-type: none"> - check the power supply – whether green LED lights - check the interconnection flat cable between module and power supply - have the module repaired
2	CNT is lit other LEDs do not light at all	module does not transmit	<ul style="list-style-type: none"> - check whether input levels of individual inputs change in the range of distinguishing extents, time period of level, see basic parameters - check module parameters setup - have the module repaired
3	CNT is lit input LEDs light according to input states TX and RX LEDs do not blink	module does not transmit	<ul style="list-style-type: none"> - check module parameters setup - have the module repaired
4	RX LED does not blink CNT is lit input LEDs light according to input states TX LED blinks	module transmits but does not receive	<ul style="list-style-type: none"> - check module parameters setup – mainly address - modules are connected to different phases, different transformation stations – no connection - have the module repaired

BASIC PARAMETERS

usage	reading of logical states
number of measured points	4
input levels of +30V input	
log.0	0 ÷ +2V
log.1	+3,5 ÷ +30V (max)
level duration	
network mode	> 200 ms
pair mode	> 1 sec
insulation strength	5000V
input levels of ~230V input	
log.0	0 ÷ ~30V _{ef}
log.1	~150 ÷ ~230 V _{ef} (max)
level duration	
network mode	> 200 ms
pair mode	> 1 sec
insulation strength	5000V
self record of input data	none
climate environment	normal
working temperature	-20 °C to +60 °C
limit temperature	-30 °C to +70 °C
storage temperature	-40 °C to +80 °C
external power supply voltage U _n	+ 15V to +19V
current consumption from PS - standby	cca 0,13 A
- transmission	cca 0,7A
Safety class	II
equipment complies with norms:	ČSN EN 61010-1, ČSN EN 60529, ČSN EN 61000-6-2, ČSN EN 61000-6-3