TAP-CHANGER
DISPLAY

TYPE

N-DIN-X20T

OPERATION MANUAL

CE

INDEX

1. GENERAL UTILIZATION AND COMMISSIONING DIRECTIONS

Always make reference to the specific description of the product and to the Manufacturer's instruction. Carefully observe the following warnings.

1.1 - Storage and Transportation

must comply with the environmental conditions stated on the product's instruction or by the applicable IEC standards.

1.2 - Installation

must be properly made and in compliance with the operational ambient conditions stated by the Manufacturer.

1.3 - Electrical Connection

must be made strictly according to the wiring diagram supplied with the Product, to its electrical characteristics and in compliance with the applicable standards particularly with reference to human safety.

1.4 - Measuring Inputs and Power Supply

carefully check that the value of input quantities and power supply voltage are proper and within the permissible variation limits.

1.5 - Outputs Loading

must be compatible with their declared performance.

1.6 - Protection Earthing

When earthing is required, carefully check its efficiency.

1.7 - Setting and Calibration

Carefully check the proper setting of the different functions according to the configuration of the protected system, the safety regulations and the co-ordination with other equipment.

1.8 - Safety Protection

Carefully check that all safety means are correctly mounted, apply proper seals where required and periodically check their integrity.

1.9 - Handling

Notwithstanding the highest practicable protection means used in designing M.S. electronic circuits, the electronic components and semiconductor devices mounted inside can be seriously damaged by electrostatic voltage discharge which can be experienced when handling the cards.
The damage caused by electrostatic discharge may not be immediately apparent but the design reliability and the long life of the product will have been reduced. The electronic circuits produced by M.S. are completely safe from electrostatic discharge when housed in their case; dismounting the cards without proper cautions expose them to the risk of damage and voids any guarantee and relieves the Manufacture of any liability.

1.10 - Waste Disposal of Electrical & Electronic Equipment

(Applicable throughout the European Union and other European countries with separate collection program).
This product should not be treated as household waste when you wish dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequence to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resource.

1.11 - Maintenance

Make reference to the instruction manual of the Manufacturer ; maintenance must be carried-out by specially trained people and in strict conformity with the safety regulations.

1.12 - Fault Detection and Repair

Internal calibrations and components should not be alterated or replaced.
For repair please ask the Manufacturer or its authorised Dealers.

Misapplication of the above warnings and instruction relieves the Manufacturer of any liability.

2. GENERAL CHARACTERISTICS

N-DIN-X20T measures a (4 ÷ 20)mA current loop signal that comes from the on-load tap-changer and display the tap position. Moreover the (4 ÷ 20)mA signal is optically insulated and repeated on two outputs (on request).
The measured input current is converted in tap position according to the following table:

TAP Indication		Input (mA)	Range (mA)		
-	**10**	**4.00**	0	x	< 4.4
-	**9**	**4.88**	4.4 <	x	< 5.3
-	**8**	**5.77**	5.3 <	x	< 6.2
-	**7**	**6.66**	6.2 <	x	< 7.1
-	**6**	**7.55**	7.1 <	x	< 8.0
-	**5**	**8.44**	8.0 <	x	< 8.9
-	**4**	**9.33**	8.9 <	x	< 9.8
-	**3**	**10.2**	9.8 <	x	< 10.7
-	**2**	**11.1**	10.7 <	x	< 11.6
-	**1**	**12.0**	11.6 <	x	< 12.4
	0	**12.8**	12.4 <	x	< 13.3
+	**1**	**13.7**	13.3 <	x	< 14.2
+	**2**	**14.6**	14.2 <	x	< 15.1
+	**3**	**15.5**	15.1 <	x	< 16.0
+	**4**	**16.4**	16.0 <	x	< 16.9
+	**5**	**17.3**	16.9 <	x	< 17.8
+	**6**	**18.2**	17.8 <	x	< 18.7
+	**8**	**19.1**	18.7 <	x	< 19.6
+	**9**	**20.0**		x	> 19.6

The measuring inputs have the following ratings:

- Rated continuous current (4 ÷ 20)mA
- Overload: 30mA continuous

- Two output relays (R1, R2), each with one Normally Open 6A rating contact, are available.

Make electric connection in conformity with the diagram reported on relay's enclosure.
Check that input currents are same as reported on the diagram and on the test certificate.

2.1 - Power Supply

The auxiliary power is supplied by a built-in module fully isolated an self-protected.

Two options are available:

a) - 24V(-20%) / 80V(+15%) a.c.
24V(-20%) / 90V(+20%) d.c.

b) - 80V(-20%) / 230V(+15%) a.c.
90V(-20%) / 250V(+20%) d.c.

Before energising the unit check that supply voltage is within the allowed limits.

2.1 – Self-diagnostic

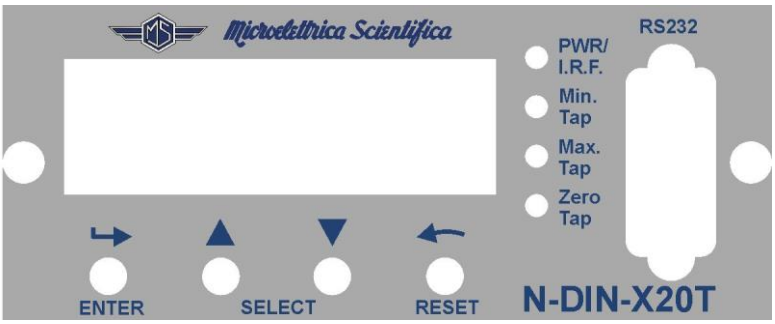
The N-DIN-X20T incorporates a sophisticated self-diagnostic feature that continuously checks the following elements:

- A/D conversion
- Checksum of the settings stored into E^2P.
- DSP general operation (Power, Routines, etc.)
- Lamp test (only on manual test).

Any time Power is switched on, a complete test is run; then, during normal operation, the test is run continuously and the checksum is done any time a parameter is stored into E^2P.
If during the test any Relay Internal Failure (I.R.F) is detected the led “Power/IRF” will flash.

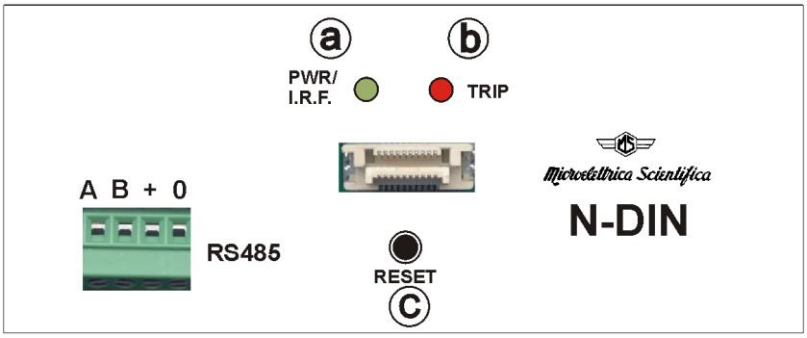
3. SIGNALIZATIONS

Four signal leds are available on the removable **F**ront **F**ace **P**anel (FFP):



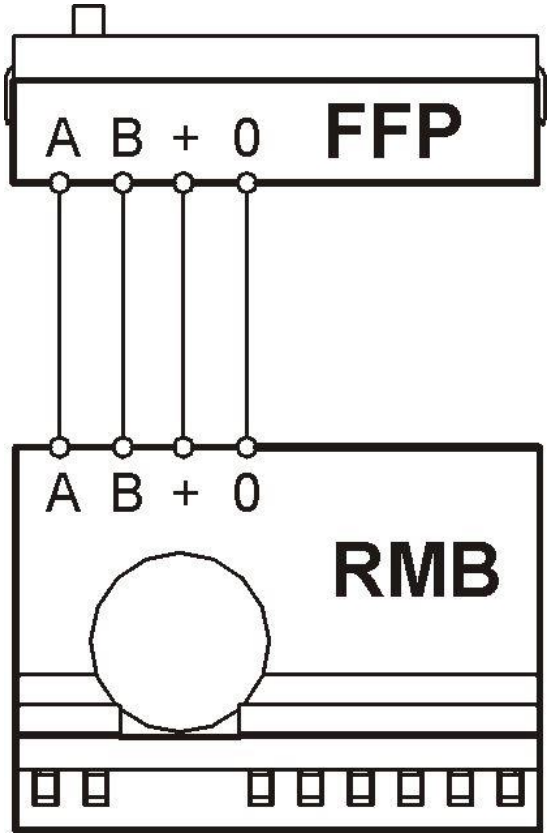
a)	Green LED	**PWR/ I.R.F.**	❑ ❑	Illuminated during normal operation when Power Supply is ON. Flashing when a Relay Internal Fault is detected.
b)	Yellow LED	**Min. Tap**	❑	Illuminated when Tap-changer is in Minimum Tap position
c)	Red LED	**Max. Tap.**	❑	Illuminated when Tap-changer is in Maximum Tap position
d)	Green LED	**Zero Tap**	❑	Illuminated when Tap-changer is in Zero Tap position

Other two leds are provided on the **R**elay **M**ain **B**ody (RMB) visible when the front face is removed



a)	Green LED	**PWR/ I.R.F.**	❑ ❑	Illuminated during normal operation when Power Supply is ON. Flashing when a Relay Internal Fault is detected.
b)	Red LED	**TRIP**	❑	Not Used on this version
c)	Button	**RESET**	❑	Not Used on this version

4. CONNECTION FFP to RMB



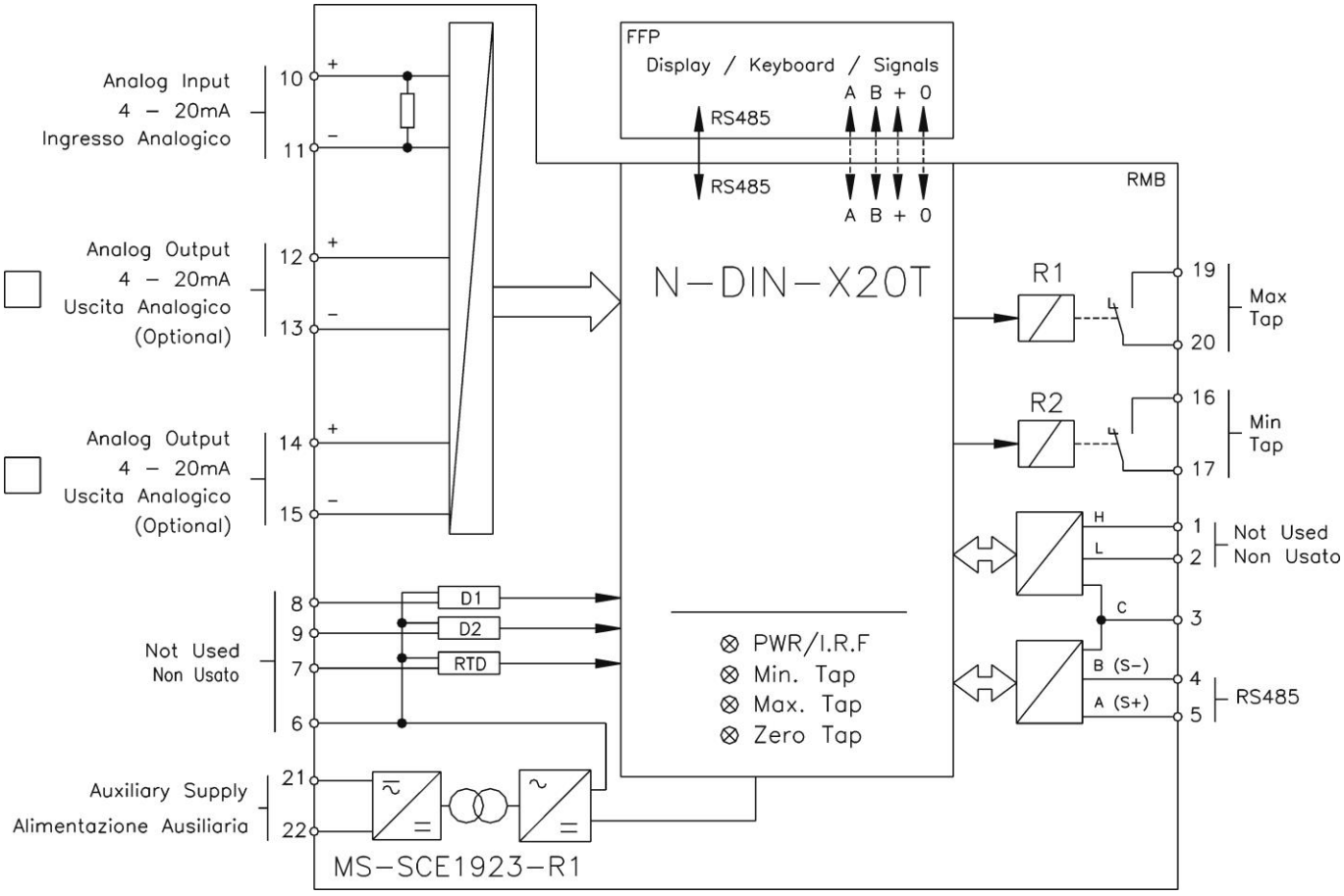
5. MAINTENANCE

No maintenance is required. In case of malfunctioning please contact Microelettrica Scientifica Service or the local Authorised Dealer mentioning the relay's Serial No reported in the label on relays enclosure.

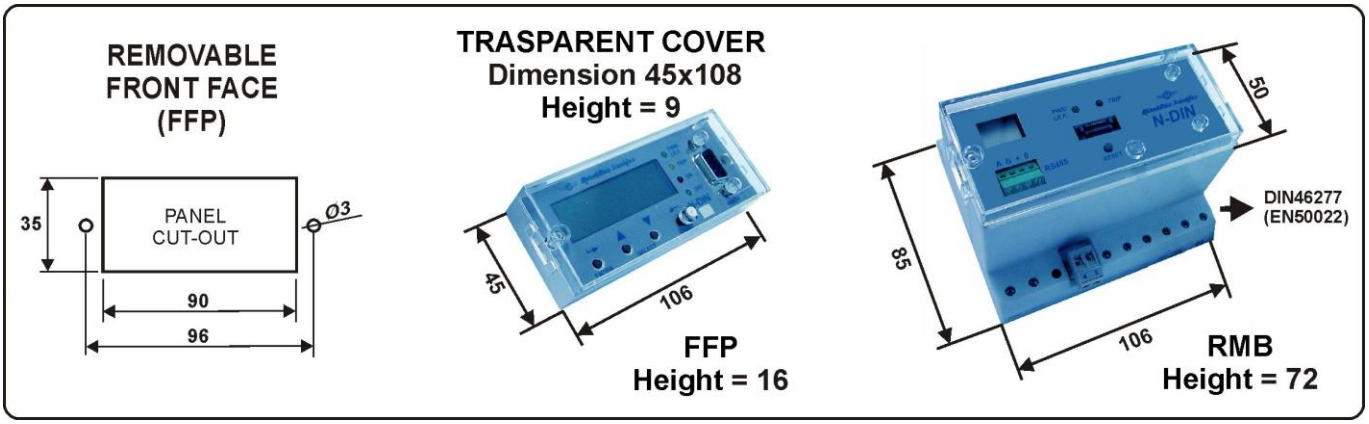
6. POWER FREQUENCY INSULATION TEST

Every relay individually undergoes a factory insulation test according to IEC255-5 standard at 2 kV, 50 Hz 1min. Insulation test should not be repeated as it unusefully stresses the dielectrics. When doing the insulation test, the terminals relevant to serial output, digital inputs and RTD input must always be short circuited to ground. When relays are mounted in switchboards or relay boards that have to undergo the insulation tests, the relay should be isolated. This is extremely important as discharges eventually tacking place in other parts or components of the board can severely damage the relays or cause damages, not immediately evident to the electronic components.

7. CONNECTION DIAGRAM



8. OVERALL DIMENSIONS



1) To mount FFP on RMB plug-in the connector and tighten the two screws.

2) To remove FFP from RMB loosen the two screws and pull-out.

Note: Before plugging in removing the FFP, the Auxiliary Power Supply must be switched OFF

N.B.

A sealable transparent cover is also available for protection of the controls on the removable Front Panel. – To remove the cover slightly pull the side fastening clips.

9. ELECTRICAL CHARACTERISTICS

APPROVAL: CE

REFERENCE STANDARDS	**IEC 60255 - CE Directive - EN/IEC61000 - IEEE C37**			
❑ Dielectric test voltage	IEC 60255-5	2kV, 50/60Hz, 1 min.		
❑ Impulse test voltage	IEC 60255-5	5kV (c.m.), 2kV (d.m.) – 1,2/50μs		
❑ Insulation resistance	> 100MΩ			
Environmental Std. Ref. (IEC 68-2-1 - 68-2-2 - 68-2-33)				
❑ Operation ambient temperature	-10°C / +55°C			
❑ Storage temperature	-25°C / +70°C			
❑ Humidity	IEC68-2-3 RH 93% Without Condensing AT 40°C			
CE EMC Compatibility (EN61000-6-2 - EN61000-6-4 - EN50263)				
❑ Electromagnetic emission	EN55011		industrial environment	
❑ Radiated electromagnetic field immunity test	IEC61000-4-3 ENV50204	level 3	80-1000MHz 900MHz/200Hz	10V/m 10V/m
❑ Conducted disturbances immunity test	IEC61000-4-6	level 3	0.15-80MHz	10V
❑ Electrostatic discharge test	IEC61000-4-2	level 3	6kV contact / 8kV air	
❑ Power frequency magnetic test	IEC61000-4-8		1000A/m	50/60Hz
❑ Pulse magnetic field	IEC61000-4-9		1000A/m, 8/20μs	
❑ Damped oscillatory magnetic field	IEC61000-4-10		100A/m, 0.1-1MHz	
❑ Electrical fast transient/burst	IEC61000-4-4	level 3	2kV, 5kHz	
❑ HF disturbance test with damped oscillatory wave (1MHz burst test)	IEC60255-22-1	class 3	400pps, 2,5kV (m.c.), 1kV (d.m.)	
❑ Oscillatory waves (Ring waves)	IEC61000-4-12	level 4	4kV(c.m.), 2kV(d.m.)	
❑ Surge immunity test	IEC61000-4-5	level 4	2kV(c.m.), 1kV(d.m.)	
❑ Voltage interruptions	IEC60255-4-11		50ms	
❑ Resistance to vibration and shocks	IEC60255-21-1 - IEC60255-21-2 10-500Hz 1g			
ELECTRIC RATED VALUE				
❑ Rated Current	4 – 20 mA			
❑ Current overload	30 mA			
❑ Average power supply consumption	≤ 7 VA			
❑ Output relays	rating 6 A; Vn = 250 V A.C. resistive switching = 1500VA (400V max) make = 30 A (peak) 0,5 sec. break = 0.2 A, 110 Vcc, L/R = 40 ms (100.000 op.)			

Microelettrica Scientifica S.p.A. - 20089 Rozzano (MI) - Italy - Via Alberelle, 56/68
Tel. (+39) 02 575731 - Fax (+39) 02 57510940
http://www.microelettrica.com **e-mail :** info@microelettrica.com