



MORE

EXTENDED **MO**DULAR **RE**LAYS

**MORE ADVANCED,
HIGH-END IEDs
FOR PROTECTING,
MONITORING AND
CONTROLLING ELECTRIC
POWER SYSTEMS.**



THYTRONIC

ENERGY FOR A SAFER FUTURE

OUR COMMITMENT TO THE FUTURE

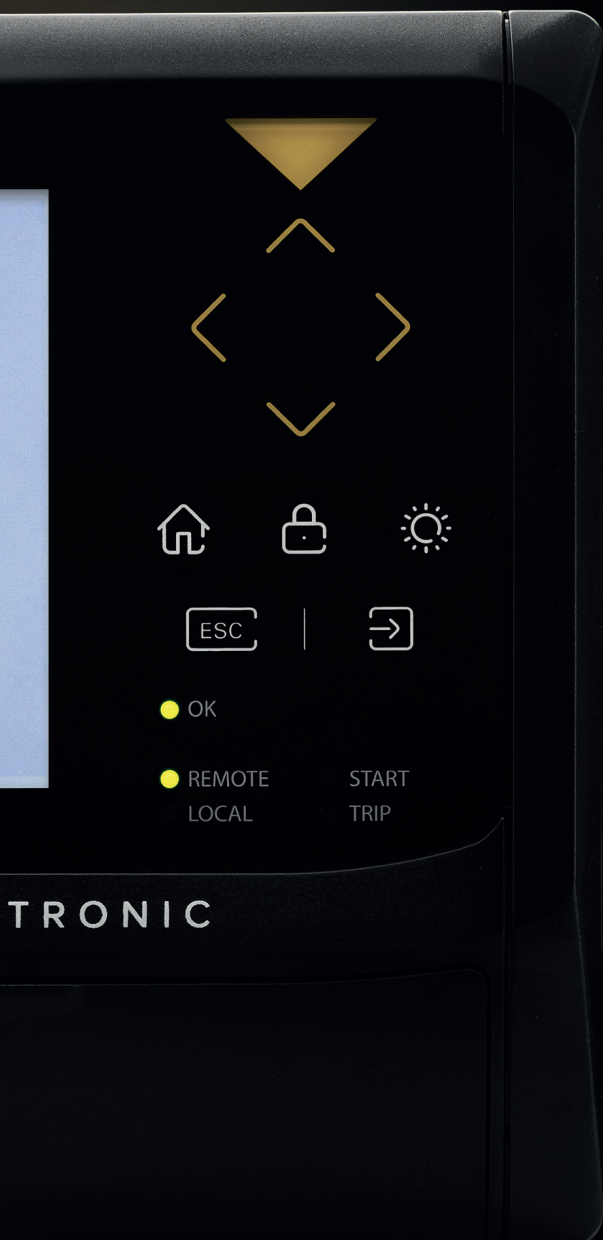
Every day, we wonder how we can face the challenge of a future in which electric power - from generation to distribution - will be a value to protect and use responsibly, as Power Grids have become one of the most complex systems built by humans, adding the latest innovative solutions to basic electrical engineering to produce flexible, intelligent and environmentally sustainable systems.

Our answer to those important challenges is more than 50 years of expertise in designing and manufacturing Protective Relays and Digital Solutions for safer, more reliable and more intelligent Power Grids. And above all, our vision is a world where human and artificial intelligence will merge to create new working systems, products and connections: only through this policy will we enhance our potential for development, growth and progress, and have the opportunity to deal with increasingly interesting issues, contact key clients, improve our skills and employ cutting-edge technologies to develop new products.

This is our commitment: to use all our energy for a safer future.



 THY



INTRODUCING XMORE: THE X MORE THAT MAKES THE DIFFERENCE

The XMORE platform is the latest Thytronic product line to protect power generation and distribution and covers all energy market solutions:

- ▶ Utility
 - ▶ Renewable generation
 - ▶ Oil&Gas
 - ▶ Transportation
 - ▶ Large energy-consuming industry

Highly flexible and scalable in terms of performance, XMORE offers tailor-made solutions thanks to the modularity of the hardware and software components. Basic solutions and more complex configurations can be engineered referring to the same product platform: evolving your application at any time.

The long-term protection solution: XMORE's higher computing capabilities and expandable architecture increase the lifespan of the products and lower overall total ownership costs.



ACCURATE MEASUREMENTS

Enhancements to protect and analyze power system operation in disturbance conditions:

- ▶ Up to 12 analogue inputs
- ▶ Non conventional CT's/VT's inputs
- ▶ 32 sample for cycle Oscillography fault recording
- ▶ Up to 0,5 class Power and Energy measurement
- ▶ 64 sample for cycle measurement for accuracy of protection element

HARDWARE AND SOFTWARE MODULARITY

Customization of the product from the basic solution to the more complex configuration:

- ▶ Plug in modules for HW expansion
- ▶ Licensable SW Pack
- ▶ I/O's cards
- ▶ ArcFlash module
- ▶ Analogue (PT100, 4-20mA) cards
- ▶ Communication cards
- ▶ Short circuiting CT's connector

TIME SYNCHRONIZATION

Enhanced Time synchronization solution for SOE recording:

- ▶ Precision Time Protocol PTP according to IEC1588
- ▶ SNTP

MORE FLEXIBLE

The XMORE platform is characterized by the high modularity and scalability of all its components.

Products are easy to customize by adding hardware modules and using the software packages needed for any specific protection application: feeder, power and distribution transformer, motor and generator, capacitor bank protection.

The most suitable and scalable solution to meet today's and tomorrow's investments in power system protection and control.

MORE SIMPLE-X

XMORE design aims to the easiness of the use. The local HMI – full size touch panel and graphical display with 10 key control function – and THYVISOR IED manager software grant a quick and easier configuration and maintenance of the relays while embedded Web Server allows easy and fast IED's data monitoring.

The easy to use IED's platform for any users: panel builders, system integrators and end-customers.

MORE EXCELLENT

Today, XMORE is the leader when it comes to protection relay technology with a dependable and proven protection algorithm; accurate fault detection; comprehensive control monitoring and automation operation; greater connectivity with multiple redundant communication ports supporting the following protocols: IEC61850 ed2, IEC103, Modbus TCP/IP, DNP3.

The scalable hardware modularity grants up to 12 measuring analogue inputs, 53 BI, 31 BO, 16 configurable tri-color LEDs and a high speed I/O module performing arc flash protection.

Short circuiting CT's connector and pluggable main cards allow quicker maintenance and recovery time.

MORE EXPERIENCED

XMORE is the result of in-depth study based on more than 50 years of Thytronic technical innovation and experience in power system protection.

A successful future in protection is built on the strength of current expertise and the experience of the past.



COMMUNICATION SECURITY

Communication Security through redundancy protocol and Cyber Security package :

- ▶ High available Seamless Redundancy support HSR
- ▶ Parallel Redundancy Protocol support PRP
- ▶ Rapid Spanning Tree Protocol RSTP
- ▶ Advanced built in Cyber Security



NETWORK CONNECTIVITY

Widely implemented in Smart Grid and Substation Automation System:

- ▶ IEC61850 Ed.2
- ▶ IEC 60870-5-103
- ▶ Modbus (Serial/TCP)
- ▶ DNP3 (Serial/TCP)









AUTOMATION CONTROL & MONITORING

Enhanced tools and solutions for Grid Automation

- ▶ IEC1131 PLC embedded
- ▶ Switchgear Monitoring/Control
- ▶ Switchgear OPEN/CLOSE local keys
- ▶ Multi shot Automatic Reclosing
- ▶ Multiple setting Profile
- ▶ CB health monitoring
- ▶ CT's and VT's monitoring

SELECTION GUIDE

							
		XMR-A 4I+(1V/1A)	XMR-V 4V	XMR-P 4I+4V	XMR-D 4I+4V (4I+64F)	XMR-T 8-11I+1V 2-3 windings	XMR-C 4I+4V
APPLICATION							
Voltage			●	●	●		●
Feeder		●		●	●		●
Transformer		●		●	●	●	●
Motor		●		●	●		
Generator				●	●		
Capacitor Bank							●
HARDWARE							
Measuring inputs	Phase current	1/5A CT (x3)		1/5A CT (x3)	1/5A CT (x6)	1/5A CT (x6-9)	1/5A CT (x3)
	Residual current	1/5A CT (x2) ***		1/5A CT (x1)	1/5A CT (x2)	1/5A CT (x2)	1/5A CT (x1)
	Phase voltage		100/400V VT (x3)	100/400V VT (x3)	100/400V VT (x3)		100V VT (x3)
	Homopolar voltage	100V VT (x1) ***	100V VT (x1)	100V VT (x1)	100V VT (x1)	100V VT (x1)	100V VT (x1)
Rotor Earth Fault				Optional	●		
Arc-flash		Optional	Optional	Optional	Optional	Optional	Optional
Digital	Inputs	7 to 53 *	7 to 53 *	7 to 53 *	7 to 53 *	7 to 53 *	7 to 53 *
	Outputs	7 to 31 **	7 to 31 **	7 to 31 **	7 to 31 **	7 to 31 **	7 to 31 **
Temperature sensor input		8 (Optional)	8 (Optional)	8 (Optional)	8 (Optional)	8 (Optional)	8 (Optional)
Short Circuiting CT's connector		Optional		Optional	Optional	Optional	Optional
Non conventional CT and VT input			Optional	Optional			
Local maintenance port		RJ45	RJ45	RJ45	RJ45	RJ45	RJ45
Communication port	RS485 (x1)	Optional	Optional	Optional	Optional	Optional	Optional
	TX+RS485	Optional	Optional	Optional	Optional	Optional	Optional
	FX+RS485	Optional	Optional	Optional	Optional	Optional	Optional
	FX (x2)	Optional	Optional	Optional	Optional	Optional	Optional
	TX (x2)	Optional	Optional	Optional	Optional	Optional	Optional
Power supply		24...110 V _{AC} /V _{DC} 110...230 V _{AC} /V _{DC}	24...110 V _{AC} /V _{DC} 110...230 V _{AC} /V _{DC}	24...110 V _{AC} /V _{DC} 110...230 V _{AC} /V _{DC}	24...110 V _{AC} /V _{DC} 110...230 V _{AC} /V _{DC}	24...110 V _{AC} /V _{DC} 110...230 V _{AC} /V _{DC}	24...110 V _{AC} /V _{DC} 110...230 V _{AC} /V _{DC}
Ambient temperature, in service		-25 to 70°C	-25 to 70°C	-25 to 70°C	-25 to 70°C	-25 to 70°C	-25 to 70°C
Hardware dimensions (H/W/D)		171/178/246 mm	171/178/246 mm	171/178/246 mm	243/178/246 mm	243/178/246 mm	171/178/246 mm
COMMUNICATION							
Protocols****	IEC61850 Ed.1 & Ed.2	●	●	●	●	●	●
	IEC60870-5-103	●	●	●	●	●	●
	DNP3 TCP-IP	●	●	●	●	●	●
	DNP3 RTU	●	●	●	●	●	●
	Modbus TCP-IP	●	●	●	●	●	●
	Modbus RTU	●	●	●	●	●	●
	EtherNet IP	●	●	●	●	●	●
Redundancy protocols	RSTP	●	●	●	●	●	●
	HSR/PRP	●	●	●	●	●	●
	NTP	●	●	●	●	●	●
	PTP IEEE 1588	●	●	●	●	●	●
Cybersecurity		●	●	●	●	●	●
CONTROL&MONITORING							
PLC Programmable Logic Controller		●	●	●	●	●	●
Switchgear monitoring and control		●	●	●	●	●	●
Switchgear OPEN/CLOSE local keys		●	●	●	●	●	●
LOCAL/REMOTE fuction		●	●	●	●	●	●
Function keys		●	●	●	●	●	●
CB health monitoring		●	●	●	●	●	●
RECORDS&LOGS							
Sequence of Event Recorder (SER)		1000	1000	1000	1000	1000	1000
Sequence of Fault Recoder (SFR)		20	20	20	20	20	20
Digital Fault Recorder (DFR)		32 Sample/cycle	32 Sample/cycle	32 Sample/cycle	32 Sample/cycle	32 Sample/cycle	32 Sample/cycle
System Logging Protocol (Syslog)		●	●	●	●	●	●

* Maximum 53 inputs with 23 outputs

** Maximum 31 outputs with 39 inputs

*** VT and the second CT are optional and alternative

**** The available protocols depend on the hardware "Communication port" selected

SELECTION GUIDE

Function	ANSI Code	XMR-A	XMR-V	XMR-P	XMR-D	XMR-T	XMR-C
Underimpedence	21			●	●		
Overexcitation	24			●	●	●	
Synchro check	25		●	●	●		
Thermal protection with RTD thermometric probes	26	●	●	●	●	●	●
Undervoltage	27		●	●	●	●	●
Undervoltage	27.1 - 27.2 - 27.3 - 27.4		●				
Positive sequence undervoltage	27V1		●	●	●		
100% stator earth-fault	64S (27H - 59H)				●		
Directional active overpower	32P			●	●		
Directional reactive overpower	32Q			●	●		
Undercurrent	37	●		●	●	●	●
Directional active underpower	37P			●	●		
Directional reactive underpower	37Q			●	●		
Loss of field	40			●	●		
Negative sequence overcurrent	46LT	●		●	●	●	●
Negative sequence overcurrent for generator	46MG	●		●	●		
Neutral unbalance current	46N						●
Phase unbalance	46U						●
Negative /Positive sequence current ratio	12/11	●		●	●	●	●
Phase rotation direction check	47		●	●	●		
Thermal image	49LT	●		●	●	●	●
Thermal image	49MG	●		●	●		
Inadvertent energization	50/27			●	●		
Phase overcurrent	50/51	●		●	●	●	●
Phase overcurrent	50 (rms)/51 (rms)						●
Residual overcurrent	50N.1/51N.1-87NHIZ.1	●		●	●	●	
Residual overcurrent	50N.2/51N.2-87NHIZ.2	●			●	●	
Calculated residual overcurrent	50N(comp)/51N (comp)	●		●	●		●
Locked rotor	51LR(48)/14	●		●	●		
Voltage-controlled / restraint overcurrent	51V			●	●		
Minimum power factor	55			●	●		
Overvoltage	59		●	●	●	●	●
Overvoltage	59.1 - 59.2 - 59.3		●				
Residual overvoltage	59N	●	●	●	●	●	●
Negative sequence overvoltage	59V2		●	●	●		●
Peak repetitive overvoltage	59H						●
Average overvoltage	59Uavg		●	●			
Rotor earth fault	64F			●	●		
Low impedance restricted ground fault	64REF.1	●			●	●	
Low impedance restricted ground fault	64REF.2				●	●	
Maximum number of starts	66	●		●	●		
Directional phase overcurrent	67			●	●		
Directional earth fault overcurrent	67N	●		●	●	●	●
Directional earth fault overcurrent	67N(Comp)				●		
Out of Step	78				●		
Auto-reclose	79	●		●			
Vector jump	dphi		●	●	●		
Overfrequency	81O		●	●	●	●	●
Underfrequency	81U		●	●	●	●	●
Frequency rate of change	81R		●	●	●		
Highest harmonic distortion of the phase currents	THD-I						●
Differential - motor / generator / transformer	87M-87G-87T				●	●	
Fault Locator				●			
Breaker failure	BF	●	●	●	●	●	●
CT supervision	74CT	●		●	●	●	●
VT supervision	74VT			●	●		●
Trip circuit supervision	74TCS	●	●	●	●	●	●
Remote TRIP		●	●	●	●	●	●
Second Harmonic Restraint		●		●	●	●	●
TD							●
ArcFlash		●	●	●	●	●	●
Multiple Profiles (A, B)					●		
Multiple Profiles (A, B, C, D)		●	●	●		●	●

● Standard

● Optional with requested SW Package

● Optional with requested HW Expansion

AMPERIA

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