



Relion® 630 series

Motor protection and control REM630

Flexibility for demanding utility distribution and industrial applications

REM630 is a comprehensive motor management IED for protection, control, measuring and supervision of medium and large asynchronous motors in medium voltage industrial power systems. REM630 is a member of ABB's Relion® product family and a part of its 630 protection and control product series characterized by functional scalability and flexible configurability. REM630 also features necessary control functions required for the management of industrial motor feeder bays. The supported communication protocols including IEC 61850 offer seamless connectivity to industrial automation systems.

Application

REM630 provides main protection for asynchronous and synchronous motors and the associated drives. The motor management IED is intended for circuit breaker and contactor controlled medium sized and large synchronous and asynchronous motors in a variety of applications, such as motor drives for pumps, fans, compressors, mills, crushers, etc. The pre-defined configurations developed for REM630 can be used as such or they can easily be customized or extended with add-on functions, by means of which the motor management IED can be fine-tuned to satisfy the specific requirements of your present application.

Protection

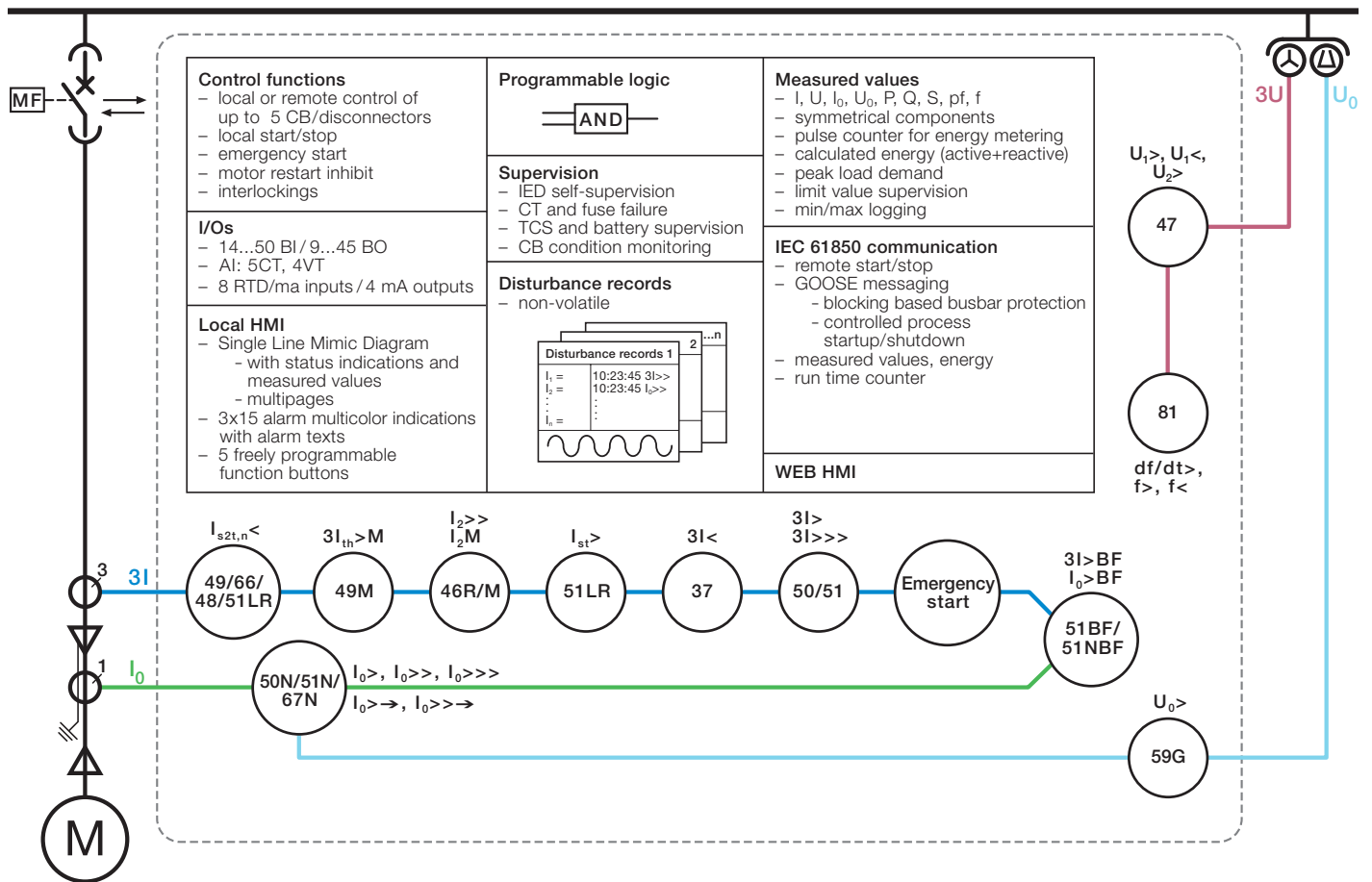
REM630 offers all the functionality needed to manage motor starts and normal drive operations also including protection and fault clearance in abnormal situations. The motor management IED features motor start-up time supervision, locked rotor protection and protection against too frequent motor starts. Furthermore, the IED offers thermal overload protection, phase unbalance protection, motor-load jam protection, loss-of-load supervision, phase-reversal protection and a provision to perform an extra emergency start of a hot motor, if required. Differential protection provides fast operation at stator winding short circuits. Alternative differential protection schemes are available: Numerical stabilized differential protection, high-

impedance or flux-balance based differential protection. REM630 also incorporates non-directional and directional earth-fault protection, back-up overcurrent protection, negative and positive phase-sequence overvoltage protection and positive phase-sequence undervoltage protection. Furthermore, synchronous motors can be provided with optional underexcitation, active/reactive overpower and rotor earth-fault (with a separate current injection device) protection functions.

The optional RTD/mA module incorporates eight analog RTD or mA measuring inputs and four mA outputs. The RTD and mA inputs can for instance be used for temperature measurement of motor bearings and stator windings, thus extending the functionality of the thermal overload protection and preventing premature aging of the motor windings. Furthermore, the RTD and mA inputs can be used for measuring the ambient air or cooling media temperature. The RTD and mA inputs can be used for supervision of analog mA signals provided by external transducers. Alternatively, the RTD/mA inputs can also be used as resistance input or as inputs for voltage transducers. The RTD/mA module enables the use of the multipurpose protection functions. These protection functions can be used for tripping and alarm purposes based on RTD/mA measuring data, or analog values communicated via GOOSE messaging. The mA outputs can be used for transferring freely selectable measured or calculated analog values to devices provided with mA input capabilities.

Control

REM630 incorporates local and remote control functions. In addition to control functions, the REM630 has a set of logical functions allowing automation and logic operations to be integrated into the unit. The IED also offers a number of freely assignable binary inputs/outputs and logic circuits for establishing bay control and interlocking functions. REM630 supports both single and double busbar substation layouts. The number of controllable primary apparatuses depends on the number of available inputs and outputs in the specified IED. Besides conventional hardwired signaling also GOOSE



REM630 functional overview of the pre-configuration A.

messaging according to IEC 61850-8-1 can be used for signal interchange between IEDs to obtain required interlocking information.

To protect the IED from unauthorized access and to maintain information integrity the device is provided with an authentication system including unique passwords for each user, which in turn are organized into user groups with different access levels.

Communication

REM630 features support for the IEC 61850 standard for communication in substations. The feeder management IED also supports the DNP3 (TCP/IP) and 60870-5-103 communication protocols. All operational information and controls are available through these protocols.

The implementation of the IEC 61850 substation communication standard in REM630 covers both vertical and horizontal communication, including GOOSE messaging.

Analog GOOSE messaging enables fast transfer of analog measurement values over the station bus, thus facilitating for example sharing of RTD input values, such as surrounding temperature values, to other IED applications. The IED interoperates with other IEC 61850 compliant IEDs, tools and systems. The substation configuration language enables smooth configuration and commissioning of substation devices. For accurate time stamping REM630 supports synchronization over Ethernet using SNTP or over a separate bus using IRIG-B.

Customizable device

The IED's user-friendly graphical configuration tool supports flexible creation of application-specific configurations. To facilitate and enhance IED engineering pre-designed configuration templates are available, offering smart re-use of configuration data. REM630 incorporates a customizable graphical display for visualizing single line mimic diagrams for various switchgear bay layouts.

REM630 motor protection and control pre-configurations

Pre-configurations

Description	Pre-configuration
Pre-configuration A for asynchronous motor	A
Pre-configuration B for asynchronous motor including differential protection	B
Number of instances available	n

Supported functions with codes and symbols

Functionality	IEC 61850	IEC 60617	ANSI	A	B	n
Protection						
Three-phase non-directional overcurrent, low stage	PHLPTOC	3I>	51P-1	1	1	1
Three-phase non-directional overcurrent, instantaneous stage	PHIPTOC	3I>>>	50P/51P	1	1	1
Non-directional earth-fault protection, low stage	EFLPTOC	I0>	51N-1	1	1	1
Non-directional earth-fault, high stage	EFHPTOC	I0>>	51N-2	1	1	1
Non-directional earth-fault, instantaneous stage	EFIPTOC	I0>>>	50N/51N	-	-	1
Directional earth-fault, low stage	DEFLPDEF	I0> →	67N-1	-	-	1
Directional earth-fault, high stage	DEFHPDEF	I0>> →	67N-2	-	-	1
Rotor earth-fault protection	MREFPTOC	I0>R	64R	-	-	1
Phase reversal protection	PREVPTOC	I2>>	46R	1	1	1
Negative sequence overcurrent protection for motors	MNSPTOC	I2>M	46M	2	2	2
Three-phase thermal overload for motors	MPTR	3Ith>M	49M	1	1	1
Loss of load supervision	LOFLPTUC	3I<	37	1	1	1
Motor load jam protection	JAMPTOC	Ist>	51LR	1	1	1
Stabilized differential protection for motors	MPDIF	3dl>M	87M	-	1	1
High-impedance or Flux-balance based differential protection for machines	MHZPDIF	3dlHi>G/M	87GH/87MH	-	-	1
Three-phase underexcitation protection	UEXPDIS	X<	40	-	-	2
Emergency start	ESMGAPC	ESTART	ESTART	1	1	1
Motor startup supervision	STTPMSU	I _{s2t} n<	48,66,14,51LR	1	1	1
Three-phase overvoltage	PHPTOV	3U>	59	-	-	2
Three-phase undervoltage	PHPTUV	3U<	27	-	-	2
Positive sequence overvoltage	PSPTOV	U1>	47O+	1	1	2
Positive sequence undervoltage	PSPTUV	U1<	47U+	1	1	2
Negative sequence overvoltage	NSPTOV	U2>	47O-	1	1	2
Residual overvoltage	ROVPTOV	U0>	59G	-	-	3
Directional over power protection	DOPDPDR	P>	32O	-	-	3
Frequency gradient	DAPFRC	df/dt>	81R	-	-	6
Overfrequency	DAPTOF	f>	81O	-	-	3
Underfrequency	DAPTUF	f<	81U	-	-	3
Circuit breaker failure	CCBRBRF	3I>/I0>BF	51BF/51NBF	1	1	2
Tripping logic	TRPPTRC	I → O	94	1	1	2
Multipurpose analogue protection function	MAPGAPC	MAP	MAP	-	-	16

Supported functions with codes and symbols

Functionality	IEC 61850	IEC 60617	ANSI	A	B	n
Control						
Bay control	QCCBAY	CBAY	CBAY	1	1	1
Interlocking interface	SCILO	CILO	3	2	2	10
Circuit breaker/disconnector control	GNRLCSWI	I ↔ O CB/DC	I ↔ O CB/DC	2	2	10
Circuit breaker	DAXCBR	I ↔ O CB	I ↔ O CB	1	1	2
Disconnecter	DAXSWI	I ↔ O DC	I ↔ O DC	1	1	8
Local remote switch interface	LOCREM	R/L	R/L	-	-	1
Generic process I/O						
Single point control (8 signals)	SPC8GGIO	-	-	-	-	5
Double point indication	DPGGIO	-	-	-	-	15
Single point indication	SPGGIO	-	-	-	-	64
Generic measured value	MVGGIO	-	-	-	-	15
Logic Rotating Switch for function selection and LHMI presentation	SLGGIO	-	-	-	-	10
Selector mini switch	VSGGIO	-	-	-	-	10
Pulse counter for energy metering	PCGGIO	-	-	-	-	4
Event counter	CNTGGIO	-	-	-	-	1
Supervision and Monitoring						
Circuit breaker condition monitoring	SSCBR	CBCM	CBCM	1	1	1
Fuse failure supervision	SEQRFUF	FUSEF	60	1	1	1
Current circuit supervision	CCRDIF	MCS 3I	MCS 3I	1	1	1
Trip circuit supervision	TCSSCBR	TCS	TCM	3	3	3
Energy monitoring	EPDMMTR	E	E	1	1	1
Station battery supervision	SPVNZBAT	U<>	U<>	-	-	1
Measured value limit supervision	MVEXP	-	-	-	-	40
Measurement						
Three-phase current	CMMXU	3I	3I	1	1	1
Three-phase voltage, (phase-to-earth voltages) (RMS)	VPHMMXU	3Upe	3Upe	-	-	1
Three phase voltage, (phase-to-phase voltages) (RMS)	VPPMMXU	3Upp	3Upp	1	1	1
Residual current	RESCMMXU	I0	I0	-	-	1
Residual voltage	RESVMMXU	U0	Vn	-	-	1
Sequence current	CSMSQI	I1, I2	I1, I2	1	1	1
Sequence voltage	VSMSQI	U1, U2	V1, V2	1	1	1
Power monitoring with P, Q, S, power factor, frequency	PWRMMXU	PQf	PQf	1	1	1
Disturbance recorder function						
Analog channels 1-10 (samples)	A1RADR	ACH1	ACH1	1	1	1
Analog channel 11-20 (samples)	A2RADR	ACH2	ACH2	-	-	1
Analog channel 21-30 (calc val)	A3RADR	ACH3	ACH3	-	-	1
Analog channel 31-40 (calc val)	A4RADR	ACH4	ACH4	-	-	1
Binary channel 1-16	B1RBDR	BCH1	BCH1	1	1	1
Binary channel 17-32	B2RBDR	BCH2	BCH2	1	1	1
Binary channel 33-48	B3RBDR	BCH3	BCH3	1	1	1
Binary channel 49-64	B4RBDR	BCH4	BCH4	1	1	1
Station communication (GOOSE)						
Binary receive	GOOSEBINRCV	-	-	-	-	10
Double point receive	GOOSEDPRCV	-	-	-	-	32
Interlock receive	GOOSEINTLKRCV	-	-	-	-	59
Integer receive	GOOSEINTRCV	-	-	-	-	32
Measured value receive	GOOSEMVRCV	-	-	-	-	62
Single point receive	GOOSESRCV	-	-	-	-	62

Contact us

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