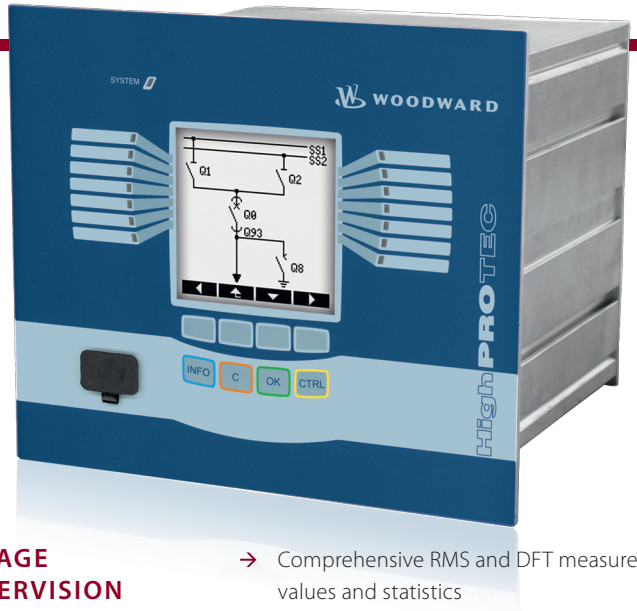
HighPROTEC | PROTECTION TECHNOLOGY MADE SIMPLE

MCA4 | PROTECTION AND CONTROL RELAY FOR FEEDER, GRID AND GENERATOR APPLICATIONS



APPLICATION

The MCA4 is a protection and control relay which uses the latest Dual-Core-Processor Technology to provide precise and reliable protective functions and is very easy to operate. It can control up to 6 switchgear. The switchgear supervision time management, position indication and interlocking functions guarantie a safe control via HMI, digital inputs or SCADA systems. Its various protective functions are specifically tailored to the protection of incoming and outgoing feeders in MV systems. It also can be used for grid and generator protection. All protection features, parameter setting and evaluation software as well as disturbance record analysis software are included in the price.

SIX STAGES PHASE OVERCURRENT PROTECTION (1)

- Directional and non-directional
- DEFT/ANSI: NINV, VINV, EINV
  IEC: NINV, VINV, LINV, EINV
  Thermal Flat, IT, I2T, I4T
- Voltage controlled and restraint

FOUR STAGES EARTH FAULT PROTECTION (2)

- Non-directional or
  Directional (multi-polarising)
- DEFT/ANSI: NINV, VINV, EINV
  IEC: NINV, VINV, LINV, EINV
  Thermal Flat, IT, I2T, I4T

TWO STAGES UNBALANCED LOAD PROTECTION

VOLTAGE PROTECTION (2)

- Six stages selectable: V<, V>, V<(t)

FLEXIBLE FOURTH VOLTAGE MEASURING INPUT (2)

- 2 stages VE> or VX (for synch-check)

SYNCHRO-CHECK

- Generator-to-System, System-to-System
- Options to switch onto dead bus bars

FREQUENCY PROTECTION

Each of the six stages can be used as:

- f< or f>
- df/dt (ROCOF)
- (f< and df/dt) or (f> and df/dt)
- (f< and DF/DT) or (f> and DF/DT)
- Delta Phi (Vector surge)

SIX STAGES VOLTAGE ASYMMETRY SUPERVISION

POWER PROTECTION

- Six stages power protection
  each can be used as:
  P>, P<, Pr, Q>, Q<, Qr, S>, S<
- Two stages power factor (PF)

Q(V) PROTECTION

- Undervoltage directional reactive power protection with reclosing disengaging

DEMAND MANAGEMENT/ PEAK VALUES

- Current and power (peak values) and average current and energy demand

POWER QUALITY

- THD protection

SUPERVISION

- Current and voltage transformer supervision
- Circuit breaker failure protection
- Trip circuit supervision
- Cold load pickup
- Switch onto fault

ADDITIONAL HIGHLIGHTS

- Automatic reclosing
- Inrush
- Thermal replica
- Plausibility checks
- Adaptive parameter sets
- Status display
- Comprehensive RMS and DFT measured values and statistics
- Masking of unused functions

RECORDERS

- Disturbance recorder, 120 s non volatile
- Fault recorder
- Event recorder
- Trend recorder

COMMISSIONING SUPPORT

- Copy and compare parameter sets
- Configuration files are up and down convertible
- Forcing and disarming of output relays
- Fault simulator: current and voltage

COMMUNICATION OPTIONS

- IEC61850
- Profibus DP
- Modbus RTU or Modbus TCP
- IEC60870-5-103

CONTROL

- of up to six switchgear
- Switchgear wear
- Exchange of single lines

LOGIC

- Up to 80 logic equations

TIME SYNCHRONISATION

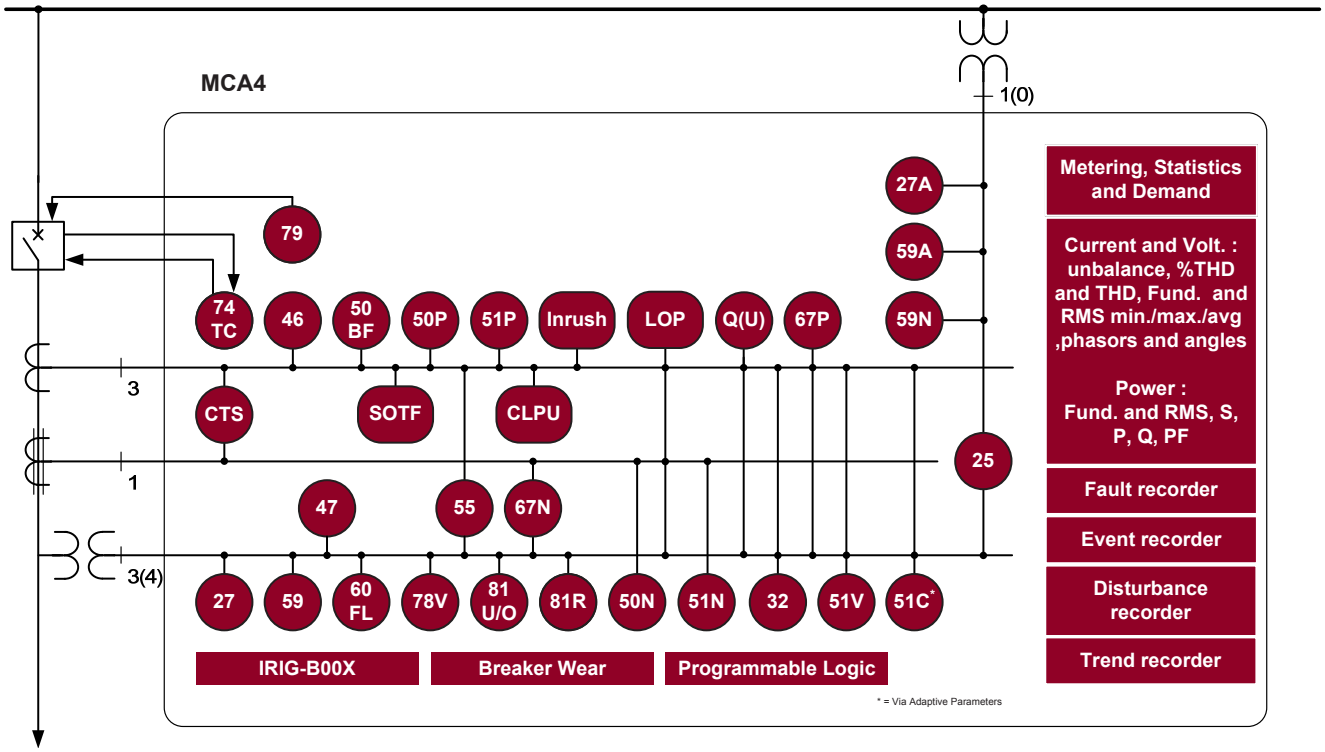
- SNTP or IRIG-B00X

(1) DFT, True RMS or I2 based
(2) DFT or True RMS based

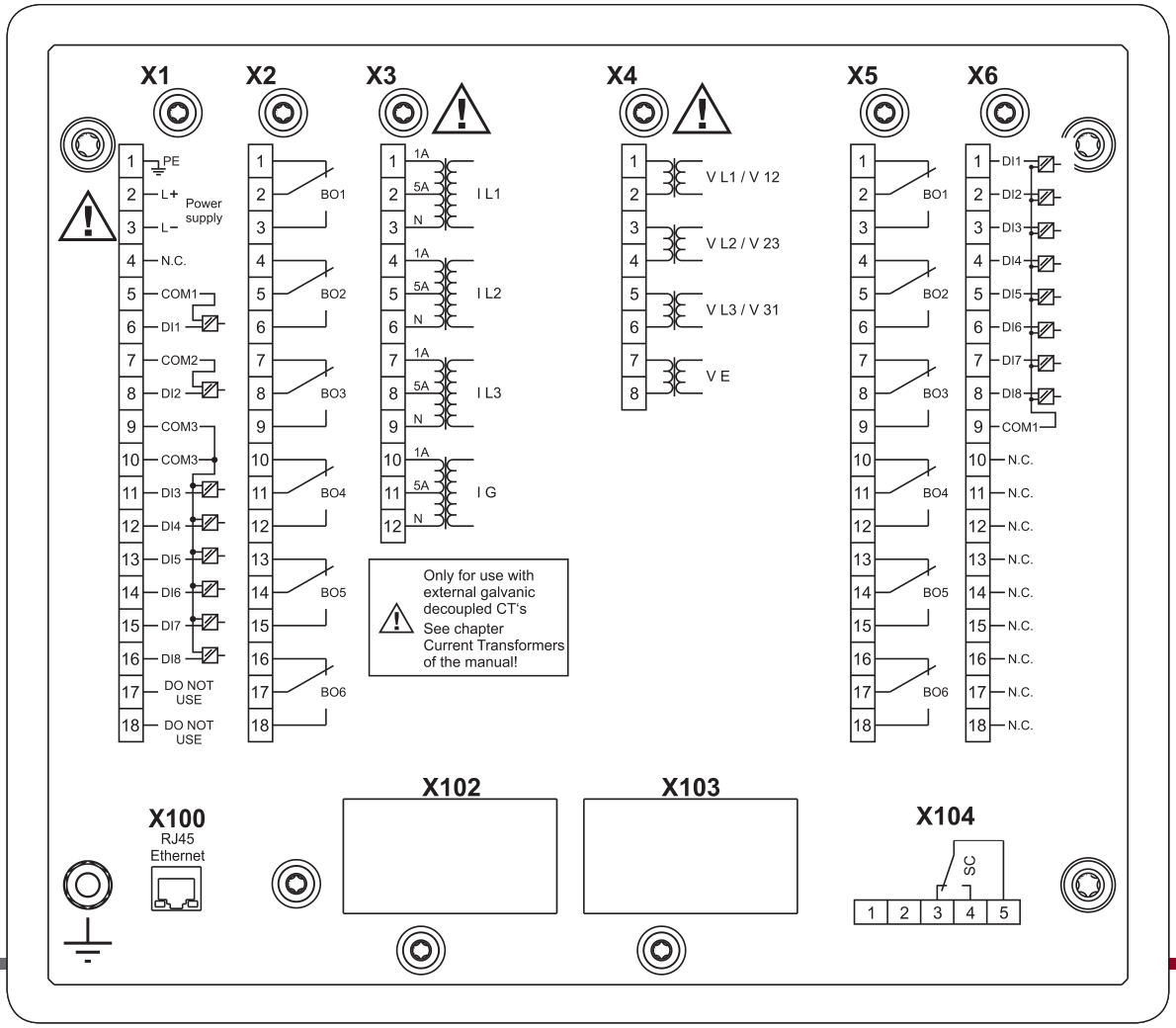
FUNCTIONAL OVERVIEW

	Elements	ANSI
Protective Functions		
I, time overcurrent and short circuit protection, all stages can be configured for directional or non-directional supervision. Tremendous reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI).	6	50P, 51P, 67P
Voltage controlled overcurrent protection by means of adaptive parameters. Voltage dependent overcurrent protection. Negative phase sequence overcurrent protection		51C 51V 51Q
I2>, unbalanced load protection with evaluation of the negative phase sequence currents	2	46
IB, overload protection with thermal replica and separate pick-up values for alarm and trip functions	1	49
IH2/In, inrush detection with evaluation of the 2nd harmonic	1	Inrush
IG, earth overcurrent and short circuit protection, all stages can be configured for directional (multi-polarising) or non-directional supervision. Tremendous reset options (instantaneous, definite time, reset characteristics according to IEC and ANSI).	4	50N, 51N, 67N
V<, V>, V(t)<, under- and overvoltage protection, time dependent undervoltage protection	6	27, 59
Voltage asymmetry supervision (V012) V1, under and overvoltage in positive phase sequence system V2, overvoltage in negative phase sequence system	6	47
Each of the six frequency protection stages can be used as: → f< or f> (over- or under frequency supervision) → df/dt rate of change of frequency (ROCOF) → (f< and df/dt) or (f> and df/dt) combination of over-, under- and rate of change of frequency (ROCOF) → (f< and DF/DT) or (f> and DF/DT) combination of over-, under- and increase of frequency → Delta Phi (Vector surge)	6	 81U/O 81R 78
VX, residual voltage protection or bus bar voltage for synchrocheck	2	59N
AR, automatic reclosing	1	79
ExP, External alarm and trip functions	4	
PQS, Power protection	6	32, 37
PF, Power factor	2	55
Q(V) Protection (undervolt. dep. directional reactive power protection with reclosing disengaging)		
Synchrocheck		25
Control and Logic		
Control: Position indication, supervision time management and interlockings for up to 6 switchgears		
Logic: Up to 80 logic equations, each with 4 inputs, selectable logical gates, timers and memory function		
Supervision Functions		
CBF, circuit breaker failure protection	1	50BF
TCS, trip circuit supervision	1	74TC
LOP, loss of potential	1	60FL
FF, fuse failure protection via digital input	1	60FL
CTS, current transformer supervision	1	60L
CLPU, cold load pickup	1	
SOTF, switch onto fault	1	
Demand management and peak value supervision (current and power)		
THD supervision		
Switchgear wear with programmable wear curves		
Recorders: Disturbance recorder, fault recorder, event recorder, trend recorder		

FUNCTIONAL OVERVIEW IN ANSI FORM



CONNECTIONS



ORDER FORM MCA4

Directional Feeder Protection			MCA4			
Digital Inputs	**Binary output relays**	**Housing**				
8	7	B2	A			
16	7	B2	B			
16	13	B2	D			
Hardware variants						
Standard				0		
Sensitive earth measurement				1		
Housing and mounting						
Door mounting					A	
Door mounting 19“ (flush mounting)					B	
Communication protocol						
Without protocol						A
RS485/terminals, Modbus RTU, IEC60870-5-103						B
Ethernet (RJ45), Modbus TCP						C
Optic fiber, Profibus DP						D
RS485/D-SUB, Profibus DP						E
Optic fiber, Modbus RTU, IEC60870-5-103						F
RS485/D-SUB, Modbus RTU, IEC60870-5-103						G
Ethernet (RJ45), IEC61850						H
Available menu languages						
English/German/Russian						

All devices are equipped with IRIG-B interface.

The parameterizing and disturbance analyzing software is included in delivery of HighPROTEC devices.

* For information about additional cost for the software update tool IEC61850 per device, please contact our sales team. The devices can be updated via device front interface (RS232) and PC locally. Please ask for availability.

Current inputs	4 (1 A and 5 A) with automatic short circuiters
Voltage inputs	4 (0–800 V)
Digital Inputs	Switching thresholds adjustable via software
Power supply	Wide range power supply
Terminals	All terminals plug type
Mounting	Door mounting
Type of enclosure	IP54
Dimensions of housing	212.7 mm x 173 mm x 209 mm (W x H x D)
Weight (max. components)	approx. 4 kg

CONTACT:

North & Central America

Phone: +1 970 498 3634
E-mail: SalesPGD_NAandCA@woodward.com

South America

Phone: +55 11 3034 1120
E-mail: SalesPGD_SA@woodward.com

Europe

Phone: +49 2152 145-319
E-mail: SalesPGD_EUROPE@woodward.com

Middle East & Africa

Phone: +971 2 6275185
E-mail: SalesPGD_MEA@woodward.com

Russia

Phone: +7 960 272 4205
E-mail: SalesPGD_RUSSIA@woodward.com

China

Phone: +86 512 8818 5515
E-mail: SalesPGD_CHINA@woodward.com

India

Phone: +91 22 2561 2256
E-mail: SalesPGD_INDIA@woodward.com

ASEAN & Oceania

Phone: +49 711 78954-511
E-mail: SalesPGD_ASEAN@woodward.com

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