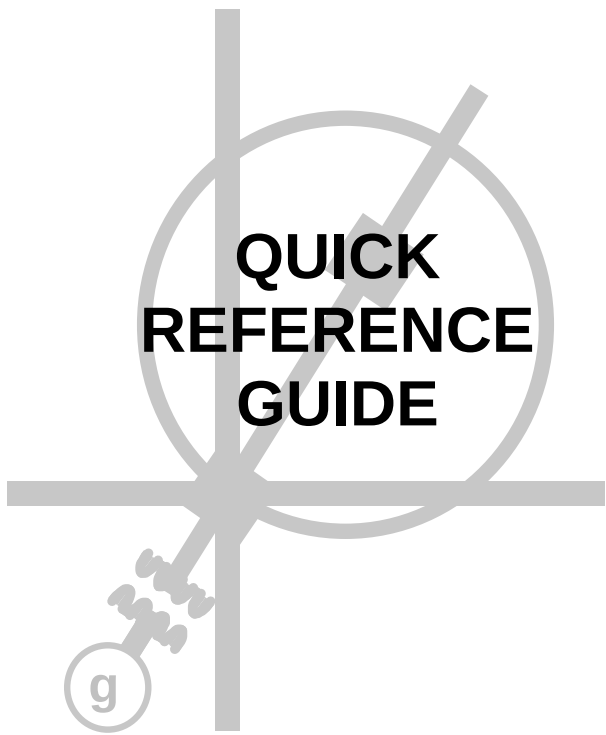


Advanced Line Protection™ System



QUICK REFERENCE GUIDE



MULTILIN

GE Power Management
205 Great Valley Parkway
Malvern, PA 19355-1337
<http://www.ge.com/edc/pm>

PROTECTION SETTINGS

No	Mnemonic	Description	Range
<u>Z1DISTANCE</u>			
101	Z1PHASE	Z1 Phase Distance	NO, YES
102	Z1PHREACH	Z1 Phase Reach	0.01-50.0
103	Z1PLEVDET	Z1 Phase Level Detector (Series Capacitor Model Only)	0.0-9.9
104	Z1GROUND	Z1 Ground Distance	NO, YES
105	Z1GRDREACH	Z1 Ground Reach	0.01-50.0
106	Z1GRDCHAR	Z1 Ground Characteristic	MHO, REACT
107	Z1SUREACH	Z1 Grd React. Mho Sup'v'n Reach	0.01-50.0
108	Z1GROUNDKO	Z1 Ground KO	1.0-7.0
109	Z1GLEVDET	Z1 Ground Level Detector (Series Capacitor Model Only)	0.0-9.9
110	Z1BLOCK	Blocking Sup'v'n of Z1	NO, YES
<u>Z2DISTANCE</u>			
201	Z2PHASE	Z2 Phase Distance	NO, YES
202	Z2PHREACH	Z2 Phase Reach	0.01-50.0
203	Z2PCHARANG	Z2 Phase Characteristic Angle	90-120
204	Z2GROUND	Z2 Ground Distance	NO, YES
205	Z2GRDCHAR	Z2 Ground Characteristic	MHO,GDOC MHO GDOC
206	Z2GRDREACH	Z2 Ground Reach	0.01-50.0
207	Z2GCHARANG	Z2 Ground Characteristic Angle	90-120
208	Z2TIMERS	Z2 Timers	NO, YES
209	Z2P_TIME	Z2 Phase Time	0.10-3.0
210	Z2G_TIME	Z2 Ground Time	0.10-3.0
<u>Z3DISTANCE</u>			
301	Z3PHASE	Z3 Phase Distance	NO, YES
302	Z3PHREACH	Z3 Phase Reach	0.01-50.0
303	Z3PCHARANG	Z3 Phase Characteristic Angle	90-120
304	Z3GROUND	Z3 Ground Distance	NO, YES
305	Z3GRDREACH	Z3 Ground Reach	0.01-50.0
306	Z3GCHARANG	Z3 Ground Characteristic Angle	90-120
307	Z3P_TIME	Z3 Phase Time	0.10-3.0
308	Z3G_TIME	Z3 Ground Time	0.10-3.0
<u>Z4DISTANCE</u>			
401	Z4PHASE	Z4 Phase Distance	NO, YES
402	Z4PHREACH	Z4 Phase Reach	0.01-50.0
403	Z4PCHARANG	Z4 Phase Characteristic Angle	80-120
404	Z4GROUND	Z4 Ground Distance	NO, YES
405	Z4GRDREACH	Z4 Ground Reach	0.01-50.0
406	Z4GCHARANG	Z4 Ground Characteristic Angle	80-120
407	Z4DIRECTN	Z4 Direction	FORWRD, REVERS
408	Z4TIMERS	Z4 Timers	NO, YES
409	Z4P_TIME	Z4 Phase Time	0.10-10.0
410	Z4G_TIME	Z4 Ground Time	0.10-10.0
<u>CURSUPVISN</u>			
501	IT_PICKUP	Trip Sup'v'n Current	0.20-4.0
502	IB_PICKUP	Block Sup'v'n Current	0.20-4.0
503	IPT_PICKUP	GDOC Trip Current	0.50-5.0
504	IPB_PICKUP	GDOC Block Current	0.50-5.0
505	IPBKFACTOR	IPB I1 Restraint	0.0, 0.066
506	NT_OFFSET	NT/NB Offset	0.0-20.0

No	Mnemonic	Description	Range
<u>CURSUPVISN (Cont'd)</u>			
507	UNBALALARM	Unbalanced Current Alarm	NO, YES
<u>OVERCURRENT</u>			
601	50	Phase Inst. Overcurrent	NO, YES
602	50_DIRCNL	Directional Control 50	NO, YES
603	50PICKUP	50 Pickup Setting	2.0-160.0
604	50PICKUPFF	50 Pickup during fuse failure	2.0-160.0
605	50G	Ground Inst. Overcurrent	NO, YES
606	50G_DIRCNL	Directional Control of 50G	NO, YES
607	50GPICKUP	50G Pickup Setting	0.5-80.0
608	50GPICKUPFF	50G Pickup during fuse failure	0.5-80.0
609	50GRESTNT	50G Restraint Setting	0.0, 0.3
611	51_DIRCNL	Directional Control 51G	NO, YES
612	51PICKUP	51G Pickup Setting	0.20-15.0
613	51PICKUPFF	51G Pickup during fuse failure	0.20-15.0
614	51GCURVE	51G Curve	INV, V-INV, E-INV, CSTM, DEF
615	51GTIMDIAL	51G Time Dial	0.5-10.0
616	DEFTIMDELY	Definite Time Delay	0.5-30.0
617	51G_RESET	51G Reset Characteristic	FAST, EM
<u>VOLTAGE</u>			
701	RATEDVOLTS	Rated Per Unit Voltage	100,105,110, 115, 120
702	PHASEOVER	Select Phase Overvoltage	NO, YES
703	PHOVPIKUP	Phase Overvoltage Pickup	0.0-2.0
704	PHOVTMDLY	Phase Overvoltage Time Delay	0.0-10.0
705	V1OVER	Select Pos. Seq. Overvoltage (Overvoltage Model Only)	NO, YES
706	V1OVINSTPU	Inst. Pos. Seq. Overvoltage Pckup (Overvoltage Model Only)	1.0-1.4
707	V1OVTIMPU	TOV Pos. Seq. OV Pickup	1.0-1.4
708	V1OVTIMDLY	Pos. Seq. OV Time Delay (Overvoltage Model Only)	0.0-10.0
709	V1COMP	Compensated Pos. Seq. OV (Overvoltage Model Only)	NO, YES
710	V1COMPINPU	Comp. Pos. Seq. OV Impedance (Overvoltage Model Only)	0.01-50.0
711	V1COMPINPU	INST Comp. Pos. Seq. OV Pckup (Overvoltage Model Only)	1.0-1.4
712	V1COMPTDPU	TOVComp. Pos. Seq. OV Pickup (Overvoltage Model Only)	1.0-1.4
713	V1COMPTDLY	Comp. Pos. Seq. OV Time Delay (Overvoltage Model Only)	0.0-10.0
714	FUSEFAIL	Potential Fuse Failure Blocking	NO, YES
<u>BLK RECLOS</u>			
801	ALL_BELOW	Block reclosing for any function	NO, YES
802	OUTOFSTEP	Block for Out of Step	NO, YES
803	ALL_3_Z2PH	Block for 3 phase faults	NO, YES
804	50G_BLOCK	Block for 50G trip	NO, YES
805	Z2TIMETRIP	Block for Z2 Time Delayed Trip	NO, YES
806	Z3TIMETRIP	Block for Z3 Time Delayed Trip	NO, YES
807	Z4TIMETRIP	Block for Z4 Time Delayed Trip	NO, YES
808	Z1PHASTRIP	Block for any Z1 phase fault	NO, YES
809	ANYZ2PHASE	Block for any Z2 phase fault	NO, YES

No	Mnemonic	Description	Range
<u>BLK RECLOS (Cont'd)</u>			
810	CONFGTRIP	Block for Configurable triplogic	NO, YES
<u>LINEPICKUP</u>			
901	LINEPICKUP	Select Line Pickup	NO, YES
902	BYPASSTL3	Bypass Line pickup time delay	NO, YES
903	I1PICKUP	I1 pickup	1.0-15.0
<u>REMOTEOPEN (Not useable in single-phase systems)</u>			
1001	REMOTEOPEN	Select remote open detector	NO, YES
1002	TL20PICKUP	Remote open detector time delay	10-100
<u>LINE OVRLD</u>			
1101	LINEOVERLD	Select line overload protection	NO, YES
1102	LEVEL1PU	Level 1 pickup current	2.5-20.0
1103	LEVEL2PU	Level 2 pickup current	5.0-40.0
1104	LEVEL1TDLY	Level 1 time delay	10-99
1105	LEVEL2TDLY	Level 2 time delay	10-99
<u>SCHEME</u>			
1201	PICKSCHEME	Select scheme logic	STEPDST, PUTT,POTT1 POTT2 HYBRID BLOCK
1202	NUMRCRV	Select number of receivers	0, 1, 2
1203	TRIPMODE	1-Phase/3-Phase trip mode (Single Pole Model Only)	3POL,1POL, 1POLZ2
1204	CARRSTART	Select function to use to start carrier in BLOCKING scheme	DIR,IPB,FD
1205	WKINFTRIP	Select Weak Infeed tripping for Hybrid scheme	NO, YES
<u>SCHMTIMERS</u>			
1301	TL1PICKUP	Trip Integrator	1-50
1302	TL4PICKUP	POTT Coord Timer PU	0-50
1303	TL4DROPOUT	POTT Coord Timer DO	0-50
1304	TL5PICKUP	BKR1 b sw Coord Timer PU	0-200
1305	TL5DROPOUT	BKR1 b sw Coord Timer DO	0-200
1306	TL6PICKUP	BKR2 b sw Coord Timer PU	0-200
1307	TL6DROPOUT	BKR2 b sw Coord Timer DO	0-200
1308	TL16PICKUP	Weak Infeed Trip Timer	8-99
1309	TL24DRPPOUT	GDOC Blocking Timer	30-500
1310	TL25DRPOUT	Distance Blocking Timer	30-500
1311	TL26PICKUP	Repeat Delay Timer	0-50
<u>LINE INFO</u>			
1401	POSSEQANG	Pos. Seq. Impedance Angle	25-90
1402	ZERSEQANG	Zero Seq. Impedance Angle	25-90
1403	ZLINE	Pos. Seq. Line Imp. in sec. ohms	0.01-50.0
1404	ZEROSEQKO	ZO/Z1 ratio	1.0-7.0
1405	LINELENGTH	Line Length	0.0-500.0
1406	LINEUNIT	Units of Length	miles, km
1407	CTRATIO	CT Ratio	1-5000
1408	PTRATIO	PT Ratio	1-7000
<u>SCADA DATA</u>			
1501	FLTLOCK	Hold Time	0-99.9

No	Mnemonic	Description	Range
<u>SCADA DATA (Cont'd)</u>			
1502	FLTRESET	Fault Location Reset Time	0-999
<u>OS BLOCKING</u>			
1601	MOBZONE	Coordinating Zone	ZON2,ZON3, ZON4
1602	MOBCHARANG	MOB characteristic Angle	30-130
1603	BLOCKWHAT	Block during OS	BLKALL, BLKDIST, BLKPHAS, BLKNONE
1604	BLOCKZ1	Block all zone 1 functions	NO, YES
1605	BLOCKZ2	Block all zone 2 functions	NO, YES
1606	BLOCKZ3	Block all zone 3 functions	NO, YES
1607	BLOCKZ4	Block all zone 4 functions	NO, YES
<u>OS TRIPPING (Out-of-Step Trip Model Only)</u>			
1701	USE_OST	Select OST	NO, YES
1702	NUMBRCHAR	Select Number of Characteristics	2, 3
1703	TRIPIN_OUT	Trip Entering or Leaving Inner	IN, OUT
1704	FWDREACH	OST Forward Reach	0.01-75.0
1705	REVREACH	OST Reverse Reach	0.01-75.0
1706	OUTER	Outer Characteristic Angle	40-165
1707	MIDDLE	Middle Characteristic Angle	40-165
1708	INNER	Inner Characteristic Angle	40-165
1709	TLOS1PU	Coordinating Timer 1 Pick-up	1-100
1710	TLOS1DO	Coordinating Timer 1 Drop-out	1-100
1711	TLOS2PU	Coordinating Timer 2 Pick-up	1-100
1712	TLOS3PU	Coordinating Timer 3 Pick-up	1-100
1713	TLOS4PU	Coordinating Timer 4 Pick-up	1-100
<u>RECLOSER (Recloser Model Only)</u>			
1801	RECLOSER	Select Reclosing Option	NONE, OFF 1POL, 3POL 1POL/3POL
1802	NUM_1P_AT	No. of attempts following SPT	0, 1
1803	NUM_3P_AT	No. of attempts following 3PT	0, 1, 2, 3, 4
1804	1PDELAY1	Single Pole First Delay	0.01-2.55
1805	3PDELAY1	Three Pole First Delay	0.01-2.55
1806	3PDELAY2	Three Pole Second Delay	0.01-2.55
1807	3PDELAY3	Three Pole Third Delay	0.01-2.55
1808	3PDELAY4	Three Pole Fourth Delay	0.01-2.55
1809	DWELLTIME	Amount of time to keep close contacts closed	0.1-2.0
1810	RESETTIME	Reset (Reclaim) Time	1-255
1811	OVRRALLTIME	Overall Time (Forces to LO)	1-255
1812	SYNCHCHECK	Synch Check Supervision	NONE, ALL_3P, DEL_3P
1813	VOLT_SUPVN	Voltage Supervision	NONE, ALL_3P
1814	LLDB	Live Line Dead Bus	NO, YES
1815	DLDB	Dead Line Dead Bus	NO, YES
1816	DLLB	Dead Line Live Bus	NO, YES
1817	VOLTS_LIVE	Live Voltage	0-130.0
1818	VOLTS_DEAD	Dead Voltage	0-130.0
1819	USE_HOLD	Hold	NO, YES
1820	HOLDDELAY	Hold Time	1.-255

PROTECTION SETTINGS

No	Mnemonic	Description	Range
<u>NONCRIT AL (In addition to self-test alarms)</u>			
1901	NCAIN1	Non-Critical Alarm Input #1 These 8 inputs are 'OR'ed together and then output to the contact assigned to the Non-Critical Alarm	0-256 depending on the choice of input assignment
1902	NCAIN2	Non-Critical Alarm Input #2	0-256
1903	NCAIN3	Non-Critical Alarm Input #3	0-256
1904	NCAIN4	Non-Critical Alarm Input #4	0-256
1905	NCAIN5	Non-Critical Alarm Input #5	0-256
1906	NCAIN6	Non-Critical Alarm Input #6	0-256
1907	NCAIN7	Non-Critical Alarm Input #7	0-256
1908	NCAIN8	Non-Critical Alarm Input #8	0-256

OUTPUTS

2001	T1	T1 Contact	0-256*
2002	T2	T2 Contact	0-256*
2003	T3	T3 Contact	0-256*
2004	T4	T4 Contact	0-256*
2005	T5	T5 Contact (Single Ph. Tripping Model Only)	0-256*
2006	T6	T6 Contact (Single Ph. Tripping Model Only)	0-256*
2007	A1(configurable)	A1 Contact	0-256*
2008	A2(configurable)	A2 Contact	0-256*
2009	A3(configurable)	A3 Contact	0-256*
2010	A4(configurable)	A4 Contact	0-256*
2011	A5(configurable)	A5 Contact	0-256*
2012	A6(configurable)	A6 Contact	0-256*
2013	A7(configurable)	A7 Contact	0-256*
2014	A8(configurable)	A8 Contact	0-256*
2015	A9(configurable)	A9 Contact (Single Ph. Tripping Model Only)	0-256*
2016	A10(configurable)	A10 Contact (Single Ph. Tripping Model Only)	0-256*
2017	A11(configurable)	A11 Contact (Single Ph. Tripping Model Only)	0-256*
2018	A12(configurable)	A12 Contact (Single Ph. Tripping Model Only)	0-256*
2019	C1(configurable)	C1 Contact	0-256*
2020	C2(configurable)	C2 Contact	0-256*
2021	KT1(configurable)	KT1 Contact	0-256*
2022	KT2(configurable)	KT2 Contact	0-256*
2023	KT3(configurable)	KT3 Contact	0-256*
2024	KT4(configurable)	KT4 Contact	0-256*
2025	CONFTRIP	Initiate 3-phase trip with input from <i>Xpression Builder</i>	0-40
2026	CONFOSC	Initiate oscillography capture with input from <i>Xpression Builder</i>	0-40

* Contact is normally open; add 1000 to number to close contact under normal conditions

GENERAL SETTINGS

CONFIGURE

101	UNITID	Unit ID	0000-9999
102	SYSFREQ	System Frequency	50,60
103	PHASROTATE	Phase Rotation	ABC, ACB

No	Mnemonic	Description	Range
<u>CONFIGURE (Cont'd)</u>			
104	TI*MESYNCH	Time Synch Source	INT, IRIG-B
105	NUM_BKR	Number of Breakers	1, 2
106	NUM_TC	No. of trip curcuits	1-2
107	NUM_MON	No. of trip Circuit Monitors	0011
108	DISPLAYVAL	Value Display Mode	PRI, SEC
109	LANGUAGE	Language Option	ENGLISH, SPANISH
<u>COMMPORTS</u>			
201	COMPORT1	Comm Port #1 Settings	Baud Rate: Parity Stop Bits xxyz
202	COMPORT2	Comm Port #2 Settings	Interface Baud Rate: Parity Stop Bits ixxyz
203	COMPORT3	Comm Port #3 Settings	Interface Baud Rate: Parity Stop Bits ixxyz
204	PROTOCOL1	Comm Port Protocol	GE-MODEM ASCII
205	PROTOCOL2	Comm Port #2 Protocol (One Rear Port Model)	GE-MODEM ASCII
206	PROTOCOL3	Comm Port #3 Protocol (Two Rear Port Model)	GE-MODEM ASCII
<u>OSC GRAPHY</u>			
301	NUMFAULTS	Number of fault records (with standard memory)	2, 4, 8, 12
301	NUMFAULTS	Number of fault records (with expanded memory)	8, 16, 32, 46
302	PREFALT	Number of prefault cycles	1-8
303	SPLITREC	Splits fault record and captures this % at end, with (1-SPLITREC) captured at beginning	0-100
<u>BRKR DUTY</u>			
401	EXPONENT	Exponent in I ² t calculation	1.0-2.0
402	MAX_OP	Max. No. of Breaker Operations for a breaker	0000-9999
403	MAX_IXT	Max. Breaker Duty for a breaker	0-999.9M
404	IXTPHASEA	Accumulated Breaker Duty Ph. A	0-999.9M
405	IXTPHASEB	Accumulated Breaker Duty Ph. B	0-999.9M
406	IXTPHASEC	Accumulated Breaker Duty Ph. C	0-999.9M
407	NUM_OP	Present No. of Breaker Oper. (3-Phase Tripping Model Only)	0000-9999
407	NUM_OP_A	Present No. of Breaker Oper. for Ph. A (Single-Phase Tripping Model Only)	0000-9999

GENERAL SETTINGS

No	Mnemonic	Description	Range
<u>BRKR DUTY(Cont'd)</u>			
408	NUM_OP_B	Present No. of Breaker Oper. for Ph. B (Single-Phase Tripping Model Only)	0000-9999
409	NUM_OP_C	Present No. of Breaker Oper. for Ph. C (Single-Phase Tripping Model Only)	0000-9999
<u>INPUTS</u>			
501	CC1	CONTACT CONVERTER 1	0-32*
502	CC2	CONTACT CONVERTER 2	0-32*
503	CC3	CONTACT CONVERTER 3	0-32*
504	CC4	CONTACT CONVERTER 4	0-32*
505	CC5	CONTACT CONVERTER 5	0-32*
506	CC6	CONTACT CONVERTER 6	0-32*
507	CC7	CONTACT CONVERTER 7	0-32*
508	CC8	CONTACT CONVERTER 8	0-32*
509	CC9	CONTACT CONVERTER 9 (Single Ph. Tripping Model Only)	0-32*
510	CC10	CONTACT CONVERTER 10 (Single Ph. Tripping Model Only)	0-32*
511	CC11	CONTACT CONVERTER 11 (Single Ph. Tripping Model Only)	0-32*
512	CC12	CONTACT CONVERTER 12 (Single Ph. Tripping Model Only)	0-32*

*Contact Converter output normally appears as a Logic 1 with normally open contact connected, to invert output to Logic 0, add 1000 to number.