

GTR-225

User manual



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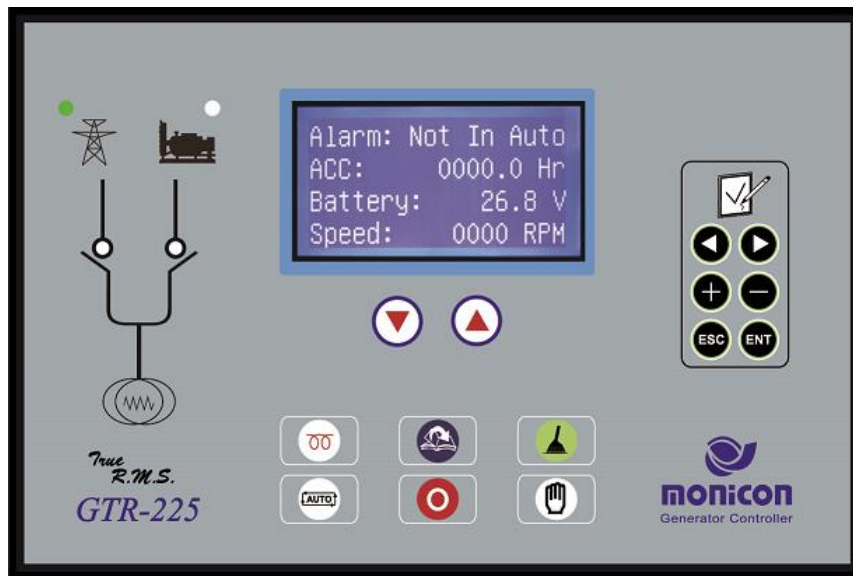
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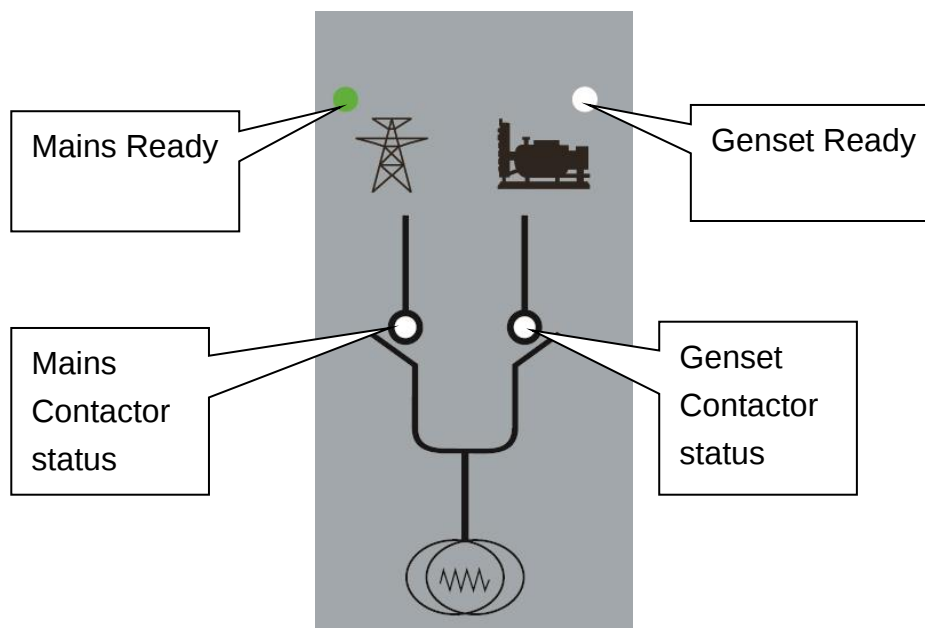
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1. Panel descriptions



1. Circuit Breaker status LED

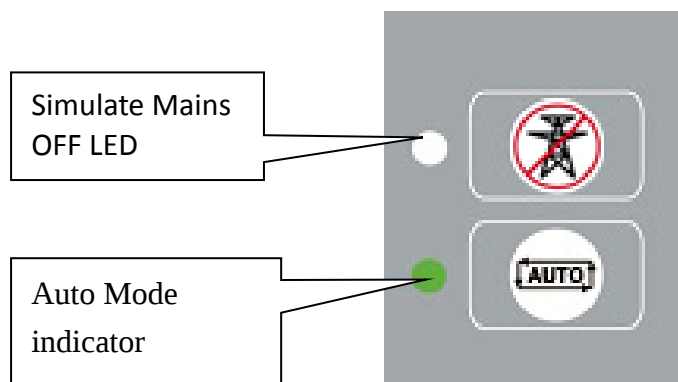


Mains Indicators : When Mains voltage and frequency is within normal range, Mains ready LED turns ON. In Auto mode, when Mains voltage or frequency is out of rang, LED turns OFF and activates Genset starting sequence. When Mains is back to normal, Genset activates shutdown sequence and transfers load back to Mains.

Genset Indicators : When Genset is running normally with voltage and frequency in range, Genset ready LED turns ON and prepare to transfer load from Mains to the Genset.

Mains Contactor Status : ATS Mains contactor closed

Genset Contactor Status : ATS Genset contactor closed



Mains OFF simulation : Press  starts simulation and LED turns ON; press again to exit

Auto Mode LED: Press  enters Auto mode and LED turns ON, press again to exit Auto mode.

2. Setup Keypad



1. In password entry mode and PARAMETER setting, this keypad switches to the next parameter.



1. In password entry mode and PARAMETER setting, this keypad switches to previous parameter.



1. In CODE entry mode, this keypad increase number.
2. Under PARAMETER setting, this keypad increases the setting value.



1. In CODE entry mode, this keypad decrease number.
2. Under the PARAMETER setting mode, this keypad reduces the setting value.



Enter or exit the parameter setting mode (default password is 0000)



Confirm and save the settings



These keypads alternately change the display of Genset information, event log, and error code.

2. Operation keypads



【Manual】



【AUTO】



【OFF】



【RESET】



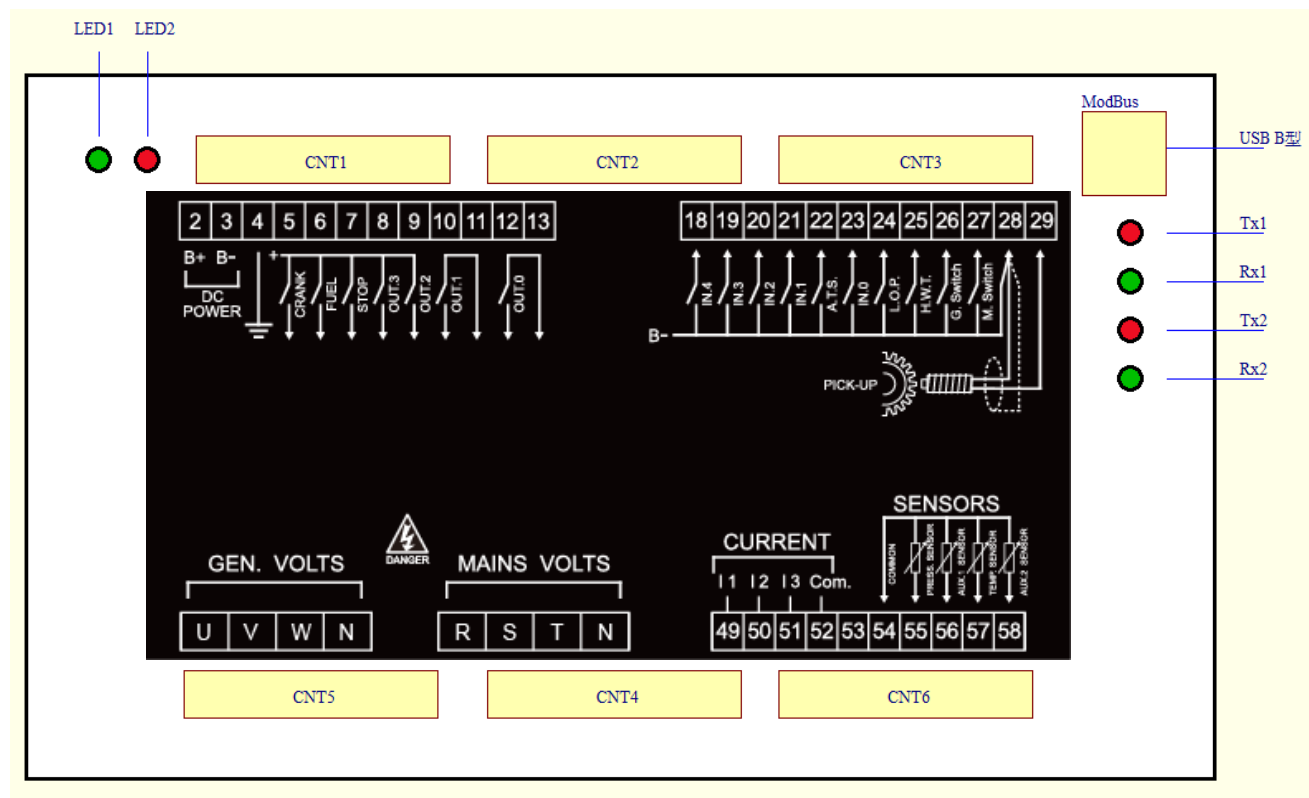
【Test with load】



【Event Log】

1. **Manual** : Press manual keypad for 2 seconds to start the engine. Then LCD shows pre-heat function; after pre-heat, engine starts immediately. If engine fails to start, the GTR-225 returns to the OFF mode. The pre-heat state may not perform, if parameter setting is 0 second. If Pre-fuel is activated, the fuel outputs before engine crank.
2. **AUTO** : Press AUTO to switch into AUTO mode. In the Auto mode, the GTR-220 starts the engine by ATS signal and then the LCD shows preheat, if pre-heat function is enabled. After pre-heat, the engine starts to crank. If engine fails to start, the system returns to the pre-heat state and then start cranking the engine again. For example, if the conditions and parameter settings are given as follow. All crank criteria are deactivated and Stop duration is 10 seconds, Crank attempts are 3 times, Pre-heat duration is 0 second. In the Auto mode, the engine cranks for 10 seconds and then rest for 10 seconds. After 3 attempts, the LCD shows the over crank and triggers the alarm.
3. **OFF** : Press OFF to stop the engine and then stop appears on the LCD. The idle also appears on the LCD, if the idle function is enabled. After 10 seconds of delay (depends on setting), the engine stops completely and idle disappears.
4. **Reset** : Press reset to clear error and deactivates alarm. Press and hold  clears error and switches into OFF mode.
5. **Test with load** : Press to forces the Genset into test mode with load. The LED lights up and ignores the 3 phase power from mains and starts the engine as mains has failed. The load transfers from mains to gen-set by ATS which is controlled by a designated output relay. Press the keypad again to leave the test mode and load switches back to mains. Then the generator goes into cooling mode and stops after cooling time has expired.
6. **Event Log** : Press  to display 1024 event records.

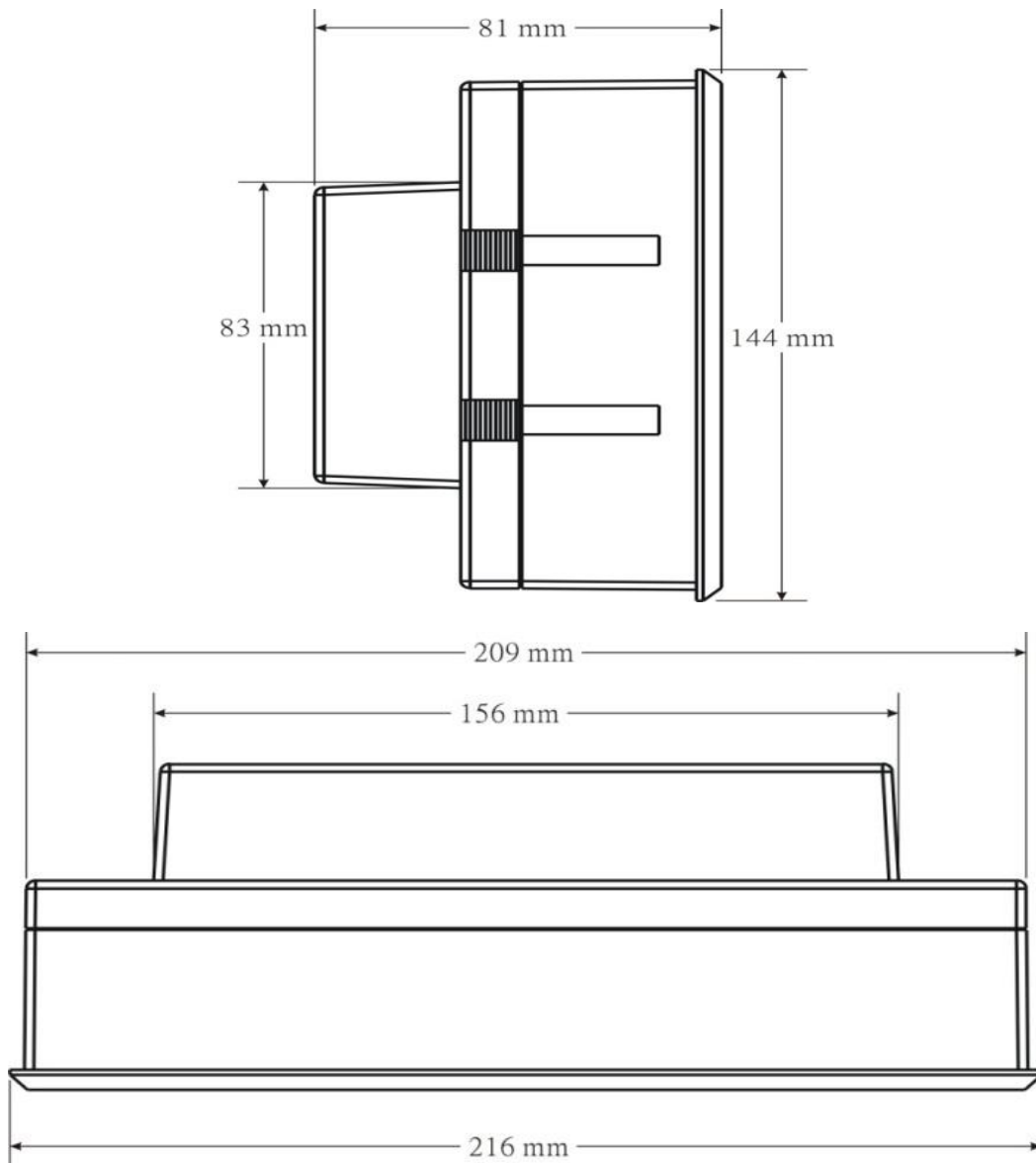
3. Rear connectors



Pin	Description	Label
2	Battery +	B+
3	Battery -	B+
4	Ground	GND
5	Starter output	Crank
6	Fuel output	Fuel
7	Stop output	STOP
8	User define Output 3	Out.3
9	User define Output 2	Out.2
10	User define Output 1	Out.1
11	User define Output 1	Out.1
12	User define Output 0	Out.0
13	User define Output 0	Out.0
18	User define input 4	In.4
19	User define input 3	In.3
20	User define input 2	In.2
21	User define input 1	In.1
22	ATS input	ATS
23	User define input 0	In.0
24	Low oil pressure switch	L.O.P.

25	High water temperature switch	H.W.T.
26	Genset Contactor status input	G. Switch
27	Mains Contactor status input	M. Switch
28	Pickup	Pickup
29	Pickup	Pickup
49	Genset CT1 (U)	I1
50	Genset CT2 (V)	I2
51	Genset CT3 (W)	I3
52	Genset CT N	COM
53	Sensor V+	Sensor V+
54	Sensor GND	Common
55	Oil Pressure sensor	Oil press
56	Oil temperature sensor	Oil Temp
57	Water temperature sensor	Coolant Temp.
58	AUX temperature sensor	Auxiliary
R	Mains Voltage R	R
S	Mains Voltage S	S
T	Mains Voltage T	T
N	Mains Voltage N	N
U	Genset voltage U	U
V	Genset voltage V	V
W	Genset voltage W	W
N	Genset voltage N	N
J5-1	CANBUS HI	D-
J5-2	CANBUS LOW	D+
J5-3	CANBUS GND	A
J5-4	RS-485 D+	B
J5-5	RS-485 D-	C

4. Dimension



5. Specification

1. Function

- A. Parameter settings
- B. Mains OFF warning
- C. Mains voltage display
- D. Mains/Genset frequency display
- E. Genset voltage/current display
- F. KW、KVAR、KWH、KVARH、P.F.
- G. RPM
- H. Running hours
- I. Battery voltage display

- J. Exerciser
- K. Water temperature/Oil pressure display
- L. 1024 Event log and
- M. 64 Error record

A. Remote access:

1. Start, stop, and reset
2. Parameter settings
3. Genset monitoring
4. Error code access

B. Front panel:

1. Manual start / Stop
2. Auto (ATS)
3. Mains OFF simulation
4. Reset

C. Protections

Engine

- 1.High water temperature
- 2.Low oil pressure
- 3.Low coolant
- 4.Over crank
- 5.Over speed
- 6.Low fuel

Generator

- 1.Over load
- 2.Short
- 3.High voltage
- 4.Low voltage
- 5.High frequency
- 6.Low frequency
- 7.Reverse power

Battery

- 1.Low voltage
- 2.High voltage
- 3.Charge fail
- 4.Under voltage

Mains

1. Voltage
2. Frequency

A. Specification

- DC input :** 8~36 VDC
- Power consumption :** Max. 24 W
- Voltage measurement :** 0~500VAC($\pm 0.2\%$)
- Current measurement :** 0~5 A * CT ratio ($\pm 0.2\%$)
- Frequency measurement :** 0~80 Hz($\pm 0.02\%$)
- Charger or pickup voltage :** 5 V ~ 70 V(peak to peak)
- Charger or pickup frequency :** 62 Hz ~ 5KHz

Relay output : 10 A/30 VDC (Output 3 Max. 1 A).
Communication protocol : A. Power environment Communication protocol
B. Modbus master Communication protocol
Working temperature : -10 °C ~ 60 °C
Dimension(W * H * D) : 216 mm * 144 mm * 89 mm
Opening(W * H) : 210 mm * 138 mm
Weight : 1 Kg

6. Engine Crank Settings

1. Detect Frequency
Setting : Disable/ Enable
Default : Enable
Description : Check generator frequency before cranking the engine.
2. Detect oil pressure
Setting : Disable/ Enable
Default : Enable
Description : Check engine oil pressure before cranking the engine.
3. Crank Interval
Setting : 5~40(seconds)
Default : 10
Description : Setup the duration of each crank period.
4. Crank attempts
Setting : 1~10
Default : 3
Description : Setup total number of crank attempts.
5. Escape Up Limit
Setting : 15~30(Hz)
Default : 20
Description : Frequency above setting disconnects starter motor.
6. Engage Low Limit
Setting : 15~30(Hz)
Description : Frequency below setting enables crank procedure
7. OP Build up Time
Setting : 0.2~2.0(Seconds)
Default : 0.6
Description : Time delay after activation of oil pressure switch before disconnecting starter motor. (“Detect oil pressure” must be enabled.)
8. Idle Interval
Setting : 0~600(Seconds)
Default : 300
Description : Duration of idle

7. Engine Settings

1. PreAdd Fuel Time
Setting : 0.0~5.0(seconds)

- Default : 3
Description : Activates fuel pump before initiating crank procedure.
2. Pre-heat Time
Setting : 1~20(Seconds)
Default : 0
Description : Duration of Preheat before engine crank.
 3. Energied To Stop
Setting : 1~30(seconds)
Default : 10
Description : Output duration for stop solenoid to shut down the engine.
 4. Failed to Stop
Setting : 1~10(Seconds)
Default : 4
Description : Time delay after “Energied to stop” timer expired and alarm triggers.
 5. Trip then shut
Setting : Disable/ Enable
Default : Enable
Description : When fault occurred, timer starts before shutdown the engine
 6. Trip Duration
Setting : 30~900(Seconds)
Default : 780
Description : When fault occurred, RUN LED flashes and controller outputs error signal, if error is not cleared within setting, system initiates Genset shutdown.
 7. Cooling Time
Setting : 0~1250(Seconds)
Default : 310
Description : Set engine cooling time for normal Genset shutdown. Engine cooling time is disabled during malfunction shutdown
 8. Freq versus RPM
Setting : 0~200
Description: To convert RPM from frequency, divide RPM by frequency (1800rpm/60HZ=30), 30 is the ratio for this setting.
 9. Man. Inst. Stop
Setting : Disable/ Enable
Default : Enable
Description : Manual shutdown the Genset without cooling down the engine

8. Hour Meter

1. ACC. Seconds/
Setting : 0~59(Seconds)
Default : 0
Description : Set the hour meter in seconds.
2. ACC. Minutes
Setting : 0~59(Minutes)
Default : 0
Description : Set the hour meter in minutes
3. ACC. Hour
Setting : 0~99(Hour)
Default : 0
Description : Set the hour meter in hours.
4. ACC. 100Hour
Setting : 0~99(*100)
Default : 0
Description : Set the hour meter in 100 hours scale.

9. Sensors Switche

1. H.W.T. Detection
Setting : Disable/ Enable
Default : Enable
Description : High water temperature protection
2. W.T. Sw. Type
Setting : NC/NO
Default : NO
Description : Setup the switch type to normally close or normally open.
3. H.W.T. Sw. Delay
Setting : 1~9.5(Seconds)
Default : 5
Description : When high water temperature triggers, timer starts before activating protection
4. L.O.P. Detection
Setting : Disable/ Enable
Default : Enable
Description : Low oil pressure protection
5. O.P. switch type
Setting : NC/NO

Default : NO

Description : Setup the switch type to normally close or normally open.

6. L.O.P Sw. Delay

Setting : 0.2~6.0(Seconds)

Default : 3

Description : When low oil pressure triggers, timer starts before activating protection

10. Auxiliary Input

1. Auto Input Delay

Setting : 0.2~5(Seconds)

Default : 1

Description : Time delay for AUTO start.

2. Input0 Detect

Setting : Disable/ Enable

Default : Enable

Description : Activates Aux 0 function

3. Input0 Name

Setting : 1~9

(1.Emergency Stop 2.User Define 3.Fanout Heat 4.Pre-Alarm 5.High fuel level 6. System trip
7.Low water temp. 8.Fault stop 9.Ground fault)

Default : 1.

Description : Define the function for AUX 0 input

4. In 0 Protection

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 4.

Description : Setup the action when AUX 0 activates

5. In0 Switch Type

Setting : NC/NO

Default : NO

Description : Setup AUX 0 to normally close or normally open

6. Input 0 delay

Setting : 0.2~5.0(Seconds)

Default : 0.2

Description : When AUX 0 input activates, timer starts before activating protection

7. Input 1 Detect

Setting : Disable/ Enable

Default : Enable

Description : Activates Aux 1 function

8. Input1 Name
Setting : 1~9
(1.Battle Switch 2. User Define 1 3. Fanout Heat 4.Pre-Alarm 5.High fuel level 6. System trip 7.Low water temp. 8.Fault stop 9.Ground fault)
Default : 1.
Description : Define function for AUX 1
9. In1 Protection
Setting : 1.Warning 2.Alarm 3.Trip 4.Stop
Default : 1.
Description : Setup the action when AUX 0 activates
10. In 1 Switch type
Setting : NC/NO
Default : NO
Description : Define AUX1 type to normally close or normally open
11. Input 1 delay
Setting : 0.2~5.0(Seconds)
Default : 1.0
Description : When AUX 1 input activates, timer starts before activating protection
12. Input 2 Detect
Setting : Disable/ Enable
Default : Enable
Description : Activates Aux 2 function
13. Input 2 Name
Setting : 1~9
(1.Low coolant level 2. User Define 2 3. Fanout Heat 4.Pre-Alarm 5.High fuel level 6. System trip 7.Low water temp. 8.Fault stop 9.Ground fault)
Default : 1.
Description : Define function for AUX 2
14. In 2 Protection
Setting : 1.Warning 2.Alarm 3.Trip 4.Stop
Default : 4
Description : Setup the action when AUX 2 activates
15. In 2 Switch type
Setting : NC/NO
Default : NO
Description : Setup AUX2 to normally close or normally open
16. Input 2 delay
Setting : 0.2~5.0(Seconds)

Default : 0.4

Description : When AUX 2 input activates, timer starts before activating protection

17. Input 3 Detect

Setting : Disable/ Enable

Default : Enable

Description : Activates Aux 3 function

18. Input 3 Name

Setting : 1~9

(1.Low fuel level 2. User Define 3 3. Fanout Heat 4.Pre-Alarm 5.High fuel level 6. System trip 7.Low water temp. 8.Fault stop 9.Ground fault)

Default : 1.

Description : Define function for AUX 3

19. In 3 Protection

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 2.

Description : Setup the action when AUX 3 activates

20. In 3 Switch type

Setting : NC/NO

Default : NO

Description : Setup AUX 3 to normally close or normally open

21. Input 3 delay

Setting : 0.2~5.0(Seconds)

Default : 0.4

Description : When AUX 3 input activates, timer starts before activating protection

22. Input 4 Detect

Setting : Disable/ Enable

Default : Enable

Description : Activates Aux 3 function

23. Input 4 Name

Setting : 1~9

(1.Isolation Fail 2. User Define 4 3. Fanout Heat 4.Pre-Alarm 5.High fuel level 6. System trip 7.Low water temp. 8.Fault stop 9.Ground fault)

Default : 1.

Description : Define function for AUX 3

24. In 4 Protection

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 2.

Description : Setup the action when AUX 3 activates

25. In 4 Switch type

Setting : NC/NO

Default : NO

Description : Setup AUX 3 to normally close or normally open

26. Input 4 delay

Setting : 0.2~5.0(Seconds)

Default : 0.4

Description : When AUX 3 input activates, timer starts before activating protection

11. Auxiliary Output

1. Output 0 function

Setting : 1~51

1.All errors	2.Trip Interval	3.Preheat	4.Idle
5.Reset	6.Breaker ON	7.Breaker hold	8. Genset normal
9.Engine running	10.Over crank	11.Over speed	12.Over frequency
13.Low frequency	14.Low oil pressure(switch)	15. High water temperature(switch)	16.High AC voltage
17.Low AC voltage	18.Overload	19.Short circuit	20.Low battery
21.High DC volt	22.Aux IN0 Activated	23. Aux IN1 activate	24. Aux IN2 activate
25. Aux IN3Activat	26. Aux IN4Activat	27.HWT Value Alarm	28. LOP Value Alarm
29. LFL Value Alarm	30.HFL Value Alarm	31.System not in AUTO	32.System in AUTO
33.Manual Start	34.AUTO Start	35.Standby	36.Pre-heat Interval
37.Pre add fuel	38.Cranking	39.Crank rest	40.System in normal
41.System Alarm	42.System Trip	43.Stop interval	44. Cooling interval
45.Reverse power	46.Over load(KW)	47.Utility Normal	48. ATS Utility Breaker ON (short period)
49. ATS Genset Breaker On (short period)	50. ATS Utility breaker Hold ON (continuous)	51. ATS Genset breaker Hold ON (continuous)	

Default : 50.

Description : Setup the function for AUX output 0

2. Output 1 function

Setting : 1~45

Default : 51.

Description : Setup the function for AUX output 1

3. Output 2 function

Setting : 1~45

Default : 20.

Description : Setup the function for AUX output 2

4. Output 3 function

Setting : 1~45

Default : 2.

Description : Setup the function for AUX output 3

CAN BUS J1939

1. J1939

Setting : Disable/ Enable

Default : Enable

Description : Enables Canbus

2. ECU Brand Selection

Range :

Caterpillar	Cummins	Chrysler	Detroit Diesel	Deutz	GM
Isuzu	Iveco	JCB	John Deere	Logger	MAN
MTU	Perkins	Scania	SISU	Standard	Steyer
VM	Volvo				

3. Send Speed Command

Setting: Disable/Enable

Default: Enable

Description: Controller sends speed command to the ECU via J1939

4. Idle Speed

Setting: 550~1300 RPM

Default: 950

Description: Setup the idle speed.

5. Rated Speed

Setting: 1200~2000 RPM

Default: 1800

Description: Setup engine normal speed.

12. Frequency

1. System Frequency

Setting : 50/60(Hz)

Description : Setup Genset frequency in 50Hz or 60Hz

2. Hi freq. Detect

Setting : Disable/ Enable

- Default : Enable
Description : High frequency protection
3. H. F. set point
Setting : 50~60/60~72(Hz)
Default : 55/66Hz
Description : When AC frequency is higher than setting, controller shuts down the engine and display high frequency fault, if high frequency detection is enable.
 4. Hi Freq. Delay
Setting : 1~9(Seconds)
Default : 2
Description : When high frequency occurs, timer starts before activating protection
 5. Low freq. Detect
Setting : Disable/ Enable
Default : Enable
Description : Low frequency protection
 6. L.F. protection
Setting : 1.Warning 2.Alarm 3.Trip 4.shutdown
Default : 3
Description : Setup the action when low frequency occurs
 7. .L.F. set point
Setting : 40~50/48~60(Hz)
Default : 45/56Hz
Description : When AC frequency is lower than setting, controller outputs trip signal.
 8. Low freq. Delay
Setting : 1~9(seconds)
Default : 3
Description : When low frequency occurs, timer starts before activating protection
 9. Mini. Freq. Det.
Setting : Disable/ Enable
Default : 1
Description : Activates Extreme low frequency protection.
 10. M.F. Set Point
Setting : 15~30(Hz)
Default : 20
Description : When sudden drop of frequency below setting; low frequency protection automatically disables and engine operates at idle speed.

13. Battery

1. System DC volt
Setting : 12/24(V)
Default : 24
Description : Setup DC voltage in 12V or 24V
2. Batt. Fault Alarm
Setting : Disable/ Enable
Default : 1
Description : Activates battery error protections
3. L. Batt set point
Setting : 8.4~12/16.8~24(V)
Default : 10.8/20
Description : When battery voltage is below setting, controller displays low DC volt warning.
4. H. Batt. Set point
Setting : 12~16.8/24~33.6(V)
Default : 14.4/28.4
Description : When battery voltage is above setting, controller displays high DC volt warning.
5. Weak Batt. Detect
Setting : Disable/ Enable
Default : 1
Description : Activates weak battery protection
6. W. Batt. Set point
Setting : 4.8~8.4/9.6~16.8(V)
Default : 6/9.6
Description : When battery voltage is below setting, controller displays battery warning.
7. Charge failed
Setting : 9.6~14.4/19.2~28.8(V)
Default : 12.6/22.6V
Description : When voltage is out of range, controller displays charge fail.

14. AC Voltage

1. Gen. Output volt
Setting : 110/120/190/208/220/380V/440V/480V/660V/3300V/4160V/6600V/7620V/11400V
Default : 380V
Description : Setup Genset AC voltage
2. Sys.Input Volt
Setting : 110/120/190/208/220/380V/440V

Default : 208V

Description : Setup Utility AC voltage

3. Hi ACV Detect

Setting : Disable/ Enable

Default : 1

Description: High voltage protection.

4. Hi ACV protect

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 4

Description : Setup the protection when high voltage occurs.

5. Hi ACV set point

Setting : 110~132/120~144/190~228/208~250/220~264/380~456(V)

Default : 122/122/210/242/242/418

Description : When AC voltage is above the setting, the controller outputs trip signal.

6. Hi ACV Delay

Setting : 0.5~5(Seconds)

Default : 2

Description : When high voltage occurred, timer starts before activating protection

7. Low ACV Detect

Setting : Disable/ Enable

Default : 1

Description : Low voltage protection

8. Low ACV protect

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 4

Description : Setup the protection when low voltage occurs

9. Low ACV setpoint

Setting : 78~110/84~120/134~190/146~208/154~220/266~380(V)

Default : 108/108/172/198/198/342

Description : When AC voltage is below setting, controller outputs stop signal

10. Low ACV Delay

Setting : 0.5~5(Seconds)

Default : 2.0

Description : When low voltage occurred, timer starts before activating protection

11. Mini. ACV Detect

Setting : Disable/ Enable

Default : 1

Description : Extreme low voltage protection.

12. Min. ACV Setpoint

Setting : 34~88/36~96/58~152/62~166/66~176/114~304(V)

Default : 56/60/96/110/110/190

Description : When sudden drop of AC voltage blows setting, low voltage protection is disabled.

13. ACV Escape Motor

Setting : Disable/ Enable

Description : Disconnect starter motor by Genset voltage

14. Esc.AC V Setpoint

Setting : 44~100/48~108/76~172/84~188/88~198/152~342(V)

Default : 72/72/124/124/132/228

Description : Disconnect starter motor when AC Voltage reaches setting

15.AC Ampere

1. Current Ratio :

Range :

20:5	30:5	40:5	50:5	60:5
75:5	80:5	100:5	150:5	200:5
250:5	300:5	400:5	500:5	600:5
700:5	750:5	800:5	900:5	1000:5
1200:5	1500:5	1600:5	2000:5	2500:5
3000:5	3200:5	4000:5	5000:5	6000:5

Default : 500:5

Description : Setup the current transformer ratio

2. Over load Detect :

Setting : Disable/ Enable

Default : 0

Description : Overload protection

3. Overload Protection :

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 4

Description : Setup the protection when overload occurs

4. O.L. set point :

Range :

0.4~5.0(A)	0.8~10.0(A)	1.2~15.0(A)	1.6~20.0(A)	2.4~30.0(A)
3.2~40.0(A)	4.0~50.0(A)	4.8~60.0(A)	5.0~75.0(A)	6.4~80.0(A)
8.0~100.0(A)	12.0~150.0(A)	16.0~200.0(A)	20.0~250.0(A)	24.0~300.0(A)
32.0~400.0(A)	40.0~500.0(A)	48.0~600.0(A)	50.0~750.0(A)	64.0~800.0(A)

72.0~900.0(A)20	80.0~1000.0(A)	96.0~1200.0(A)	120.0~1500.0(A)	128.0~1600.0(A)
160.0~2000.0(A)	200.0~2500.0(A)	240.0~3000.0(A)	252.0~3200.0(A)	320.0~4000.0(A)
400.0~5000.0(A)				

Description : When current is above setting, the controller outputs stop signal

5. Overload Delay :

Setting : 10~300(Second)

Default : 260

Description : When overload occurs, timer starts before activating protection

6. Short Detect :

Setting : Disable/ Enable

Default : 0

Description : AC short protection

7. Short protect :

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default : 4

Description : Setup the protection when AC short occurs

8. Short set point :

Setting : 1~31

0.1~20.0(A)	0.1~30.0(A)	0.1~40.0(A)	0.1~50.0(A)	0.1~60.0(A)
0.1~75.0(A)	0.1~80.0(A)	0.2~100.0(A)	0.3~150.0(A)	0.4~200.0(A)
5.0~250.0(A)	6.0~300.0(A)	8.0~400.0(A)	10.0~500.0(A)	12.0~600.0(A)
14~700.0(A)	15.0~750.0(A)	16.0~800.0(A)	18.0~900.0(A)	20.0~1000.0(A)
24.0~1200.0(A)	30.0~1500.0(A)	32.0~1600.0(A)	40.0~2000.0(A)	50.0~2500.0(A)
60.0~3000.0(A)	64.0~3200.0(A)	80.0~4000.0(A)	100.0~5000.0(A)	120~6000(A)

Description : When current is above the setting, controller outputs trip signal

9. Short Delay :

Setting : 0.1~1.0(Second)

Default : 0.2

Description : When AC short occurs, timer starts before activating protection

16. RPM

1. RPM Mul. Factor

Setting : 1~200

Default : 60

Description : Please use value calculated in next parameter setting

2. RPM Div. Factor

Setting : 1~200

Default : 40

Description : The R.P.M. numerator and denominator are the ratio of engine revolution versus total number of fly wheel teeth; or the RPM of fly wheel versus the RPM of alternator charger. For example: Set up the RPM numerator and the denominator to 1 to find input pulse from the LCD.

(A) If the engine revolution is 1800 and alternator revolution is 460 (input pulse), the R.P.M. numerator could be set to 90→ (1800÷20) and R.P.M. denominator could be set to 23→(460÷20).

Solution: $1800 / 460 = 3.913$

The R.P.M. calculation formula is as below

R.P.M. = Input pulse * (RPM numerator / RPM denominator)

$1800 = 460 * (90/23)$

(B) If the engine revolution is 1500 and total count of fly wheel teeth in one second is 4437 (input pulse), the R.P.M. numerator should be set to 45 and R.P.M. denominator should be set to 133.

Solution: $1500 / 4437 = 0.338$

The R.P.M. calculation formula is as below

R.P.M. = Input pulse * (revolution numerator / revolution denominator)

$1500 = 4437 * (45/133)$

(C) If the teeth count of engine flywheel is 118. Assume the rated rpm of Gen-set is 1500 rpm. Then the $1500 \text{ rpm}/50\text{hz} \Rightarrow 30 \text{ rpms/per second}$ also generate $30 \times 118 = 3540$ electronic signals. Then $1500 / 3540 = 0.423$ ($75/177=0.423$), set the R.P.M. numerator to 75 and R.P.M. denominator to 177.

3. RPM Escape Motor

Setting : Disable/ Enable

Description : Disconnect starter motor by RPM setting

4. RPM Esc. Setpoint

Setting : 300~900(RPM)

Default : 480

Description : Disconnect starter motor when RPM reaches setting

5. RPM Disp. Source

Setting : 1.Alternator, 2.Frequency, 3.J1939

Default : Alternator

Description : Converts the RPM from frequency, alternator speed, or CanBus.

6. O.S. Detection

Setting : Disable/ Enable

Default : Enable

Description : Over speed protection.

7. O.S. Set Point

Setting : 1350~2100(RPM)

Default : 1920

Description : If engine speed is higher than setting, controller shuts down the engine, if over

speed is enabled

8. Over Speed Delay

Setting : 1~10(Second)

Default : 4

Description : When over speed occurs, timer starts before activating protection

17. Sensors Options

1. LFL value Alarm

Setting : Disable/ Enable

Default : Enable

Description : Low fuel warning

2. L.F.L. Set point

Setting : 6~55(%)

Default : 45

Description : When fuel level is below setting, controller displays warning message.

3. H.F.L. Set Point

Setting : 35~99(%)

Default : 95

Description : When fuel level is above setting, controller displays warning message

4. LOP Value Fun.

Setting : Disable/ Enable

Default : Enable

Description : Low oil pressure warning

5. LOP Set Point

Setting : 15~60(PSI)

Default : 26

Description : When oil pressure is below setting, controller displays warning message

6. HWT Value Fun.

Setting : Disable/ Enable

Default : Enable

Description : High water temperature protection.

7. HWT Set Point

Setting : 85~110(°C)

Default : 104

Description : When water temperature is above setting, controller displays warning message

8. OP Escape Motor

Setting : Disable/ Enable

Default : Enable

Description : Disconnect starter motor when oil pressure reaches setting.

9. Esc.OP Set Point

Setting : 25~65(PSI)

Default : 39

Description : Disconnect starter motor when oil pressure reaches setting.

10. OP Sensor Brand

Setting :

VDO 10 Bar	KD 10 Bar	YG 962	N 010 B2	KL 3967251
Monicon	DATCON 10 Bar	SUSUKI 10 Bar	VDO 5 Bar	KP 6 Bar
Kamaz	Betung	Weichai	Betung 3317	User Define

Description : Setup oil pressure sensors brand.

11. WT Sensor Brand

Setting :

VDO 120	KD 120	WGI 900131	KP130	YB 054
KL 3967250	Monicon	SUSUKI	PRO	SCD
Betung	User Define			

Description : Setup water temperature sensor brand

12. FL sensor Brand

Setting :

Susuki	Betung	User Define
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Description : Setup fuel sensor brand

13. Chk. Before Start

Setting : Disable/ Enable

Default : Enable

Description : Setup the controller to check sensors during bootup.

14. Cel. Or Feh.

Setting : 0~1(°F / °C)

Default : 1

Description : Setup water temperature unit in Fahrenheit or Celsius.

15. P.S.I or Bar

Setting : 0~1(BAR /PSI)

Default : PSI

Description : Setup oil pressure unit in Bar or PSI

18. Exercise Funct.

1. Exercise Funct.

Setting : Disable/ Enable

- Default : Enable
- Description : Activates exerciser function.
- 2. Date / week Depend
 - Setting : 0~1(Date/Week)
 - Default : 0
 - Description : Setup monthly exercise by date or week.
- 3. Date Set Point
 - Setting : 1~31(date)
 - Default : 1
 - Description : Setup date of monthly exercise
- 4. Week Set Point
 - Setting : 0~6(week)
 - Default : 1
 - Description : Setup week of monthly exercise
- 5. Hour Set Point
 - Setting : 0~23(hour)
 - Default : 12
 - Description : Setup the starting hour of the exercise
- 6. Minute Set Point
 - Setting : 0~59(minute)
 - Default : 0
 - Description : Setup the starting minute of the exercise
- 7. Running Interval
 - Setting : 0~510(minute)
 - Default : 4
 - Description : Setup the duration of each exercise

19. Maintain

- 1. Maintain Funct.
 - Setting : Disable/ Enable
 - Default : Enable
 - Description : Activates service reminder function
- 2. Maintain Protect
 - Setting : 1.Warning 2.Alarm 3.Trip 4.Stop
 - Default : 2
 - Description : Setup the protection when service reminder reaches setting
- 3. Maintain Code0
 - Setting : 0~99

Default : 12

Description : Setup Second digit of service password

4. Maintain Code 1

Setting : 0~99

Default : 15

Description : Setup first digit of service password

5. Maintain Dncount

Setting : 0~1275(hour)

Default : 1200

Description : Setup the duration between each service

20. Reverse Power

1. Reverse PowerDet

Setting : Disable/ Enable

Default: Disable

Description : Reverse power detection.

2. R.P. protect

Setting : 1~4(1.Warning 2.Alarm 3.Trip 4.Stop)

Default: Stop

Description : Setup the protection when reverse power occurred

3. R.P. Set Point

Setting : 0~1084.0(KW)

Description : Setup the reverse power upper limit. (Upper limit changes with AC voltage setting and CT ratio)

4. R.P. Delay

Setting : 1~20(Seconds)

Default: 2.0

Description : When reverse power reaches setting, timer starts before activating protection

21. OverLoad Protect

1. Over Load Detect

Setting : Disable/ Enable

Default: Disable

Description : Overload detection.

2. Overload protect

Setting : 1.Warning 2.Alarm 3.Trip 4.Stop

Default: Stop

Description : Setup the protection when over load occurred

3. O. Load Setpoint

Setting :

0.08~20.0(KW)	0.1~30.0(KW)	0.1~40.0(KW)	0.1~50.0(KW)	0.1~60.0(KW)
0.1~75.0(KW)	0.1~80.0(KW)	0.2~100.0(KW)	0.3~150.0(KW)	0.4~200.0(KW)
5.0~250.0(KW)	6.0~300.0(KW)	8.0~400.0(KW)	10.0~500.0(KW)	12.0~600.0(KW)
14~700.0(KW)	15.0~750.0(KW)	16.0~800.0(KW)	18.0~900.0(KW)	20.0~1000.0(KW)
24.0~1200.0(KW)	30.0~1500.0(KW)	32.0~1600.0(KW)	40.0~2000.0(KW)	50.0~2500.0(KW)
60.0~3000.0(KW)	64.0~3200.0(KW)	80.0~4000.0(KW)	100.0~5000.0(KW)	120~6000(KW)

Description : Setup the overload amperage limit

4. Over Load Delay

Setting : 1~20(Seconds)

Default: 2.0

Description : When overload reaches setting, timer starts before activating protection

22. Other

1. Protect Pending

Setting : 1 ~ 30 (seconds)

Default : 10.5

Description : Time delay for detecting faults after engine starts.

2. Language

Setting : English/Chinese

Default : English

Description : Choose between English or Chinese language

3. Comm. address

Setting : 0 ~ 255(00H~FFH)

Default : 01H

Description : Multiple Genset networking via RS-485 requires individual address for each controller.

4. Not in AUTO

Setting : Disable/ Enable

Default: Disable

Description : When GTR-220 is in OFF mode, controller triggers alarm.

5. Contrast Adjust

Setting : 1 ~ 19

Description : Set the contrast of LCD screen

23. Utility Setting

1. Utility Low voltage

- Setting : 88~442(V)
Description : Setup mains low voltage limit
2. Utility high voltage
Setting : 110~484(V)
Description : Setup mains high voltage limit
3. Utility Unbalance
Setting : 4~60(V)
Description : Setup mains unbalance limit
4. Utility low frequency
Setting : 40~60(Hz)
Description : Setup mains low frequency limit
5. Utility high frequency
Setting : 50~72(Hz)
Description : Setup mains high frequency limit

24. Transfer Switch Setting

1. ATS Phase detection
Setting : Three/Single phase
Description : Set up single phase or three phase detection.
2. T.D.E.S.
Setting : 0.5~30(Sec)
Description : Setup time delay before engine starts
3. T.D.N.E.
Setting : 0.5~30(Sec)
Description : Setup time delay to transfer load from mains to Genset
4. T.D.E.N
Setting : 0.5~30(Sec)
Description : Setup time delay to transfer load from Genset to Mains
5. Off Pos. Delay
Setting : 0.5~30(Sec)
Description : Setup timer for switch to stay in neutral position.
6. Utility Normal
Setting : 0.5~30(Sec)
Description : Time delay after utility back to normal
7. Output duration for utility contactor (auxiliary output 0 function 48)
Setting : 0.5~30(Sec)
Description : Setup timer for mains contactor output duration.
Note: For continuous output; please select auxiliary output to function “50”

8. Output duration for Genset contactor (auxiliary output 1 function 49)

Setting : 0.5~30(Sec)

Description : Setup timer for Genset contactor output duration.

Note: For continuous output; please select Axillary output to function “51”

