Bit		Fault	LED Indication	Description	Causes	Solutions
2	3	RTS disconnected		Remote Temp Sensor has been disconnected (was properly connected)	See **Fault: RTS disconnected** above.	See **Fault: RTS disconnected** above.
3	4	Heatsink temp sensor open		Heatsink temp, sensor open circuit	Damage to heatsink temperature sensor	Without accurate temperature sensor, controller cannot prevent the heatsink temperature from exceeding safe levels. Contact distributor for service.
4	5	Heatsink temp sensor shorted		Heatsink temp, sensor short circuit	Damage to heatsink temperature sensor	Without accurate temperature sensor, controller cannot prevent the heatsink temperature from exceeding safe levels. Contact distributor for service.
5	6	High temperature current limit	R/Y – G/Y	Heatsink High Temperature Warning, reduction of charging current	Poor airflow around controller; Excessive ambient temperature	Ensure controller is mounted in a position with enough clearance on all sides. See manual for more information. Check ambient temperature at the controller location. Ensure temperature is below maximum temp rating of SSMPPT. See manual for more information.
6	7	Current limit		Active limiting of charging current	Input power exceeds controller rating	No action required, controller will operate at full rated output.
7	8	Current offset		Erroneous current reading when there should be zero current, could lead to inaccurate current measurements	Failed current offset routine	Reboot controller and allow sweep of array input. Check if Alarm returns. Contact distributor for service
8	9	Battery sense out of range	R/Y - G/Y	Battery sense voltage out of acceptable range	Damage to current measurement circuit; Disconnected wire on the Battery Sense; Greater than 5V difference between Sense and Battery Voltage	Inspect Battery sense wires and connection. Inspect Battery Sense connection.
9	10	Battery sense disconnected	R/Y - G/Y	Battery sense was working, now out of range	Disconnected wire on the Battery Sense; Greater than 5V difference between Sense and Battery Voltage	Inspect Battery power cables and connection. Inspect Battery Sense connection.
10	11	Uncalibrated	R/Y - G/Y	Factory calibration was not performed, inaccurate current and/or voltage readings may result	Calibration of measurement circuits not performed at factory	Contact distributor for service.
11	12	RTS miswire	R/Y – G/Y	Remote Temp Sensor wired incorrectly	Battery Sense and/or RTS wired incorrectly	Ensure Battery Sense and RTS wired to correct terminals with correct polarity
12-13	13-14	unused				
14	15	Miswire		External system wiring error	Wiring installation error	Check all wiring for correct connections, check for short circuits and unconnected wires.
15	16	MOSFET open		MOSFET(s) damaged - open circuit	Hardware failure	Contact distributor for service
16	17	P12		P12 internal power supply out-of-range. Unit should still operate correctly, but this is an indication of a potential hardware failure.	Internal hardware problem	Contact distributor for service
17	18	High input voltage current limit	R/Y - G/Y	PV input voltage too high, current limiting to protect hardware	Array input voltage too high for safe operation	Consult documentation for maximum array voltage. Keep array voltage below maximum rating. Be sure to take into account temperature effects on the array Voc.
18	19	ADC input max		ADC input max	Internal hardware problem	Contact distributor for service
19	20	Controller was reset		A power down reset has occurred	Internal hardware problem	See **Fault: Reset** above.
20	21	Alarm 21		EEPROM Communications Problem	Comm EEprom lockup (Control & Ethernet processors stop talking)	make sure that the unit has the latest A and B firmware - this error may be related to the I2C communications lockup problem with old firmware.
21	22	P3 voltage out of range		P3 internal power supply out-of-range. Unit should still operate correctly, but this is an indication of a potential hardware failure.	Internal hardware problem	Contact distributor for service
22	23	De-rate limit		Input power/voltage triggering operation at a de-rate limit.	System configuration/design causing the controller to operate in a derated mode, full output power not achieved	Consult documentation for deratings. If desired, evaluate system design to adjust operating points to prevent encountering a derate condition.
23	24	Array current offset		Erroneous current reading when there should be zero current, could lead to inaccurate current measurements	Failed current offset routine	Reboot controller and allow sweep of array input. Check if Alarm returns. Contact distributor for service
24	25	Alarm 25 (internal)		EEprom detected data packet error (it should recover but will be show up on internal log file under Daily Alarms ')	Damage to current measurement circuit	If repeatedly showing this alarm after reboot, contact distributor for service.
25	26	Ethernet alarm		Ethernet communications problem	Various	If repeatedly showing this alarm after reboot, contact distributor for service.
26	27	unused			Various	If repeatedly showing this alarm after reboot, contact distributor for service.
27	28	Alarm 28 (software)		Internal software error	Various	If repeatedly showing this alarm after reboot, contact distributor for service.
28	29	FP12 out-of-range		Floating 12V internal power supply out-of-range. Unit should still operate correctly, but this is an indication of a potential hardware failure.	Internal hardware problem	Contact distributor for service
29	30	Flash Memory Failure		Flash memory read/write failure, unable to access memory	Internal hardware problem	Contact distributor for service
30-31	31-32	unused			Internal hardware problem	Contact distributor for service

TS-MPPT-600V

Fault

Bit	Fault	LED Indication	Description	Causes	Solutions
0	overcurrent	R/Y – G	The charge or load current exceeds the controllers rating	PV Array is too large; The current sense circuitry is malfunctioning	Consult the TriStar documentation for maximum current ratings
1	FETs shorted	R – Y – G	MOSFETs shorted	TriStar Requires Service or replacement; A power MOSFET is damaged; An external short has occurred	Refer to the TriStar MOSFET Replacement instructions; Be sure the positive input/output power terminals are not wired together; Ensure PV Voc is greater than battery voltage
2	software bug	R – Y – G	A software error has occurred in the processor	Solar input voltage too low; This is an internal software problem	Update to latest firmware from the Morningstar website
3	battery HVD	R – G	Battery voltage exceeds high voltage disconnect threshold - halt in charging	Another charging source in the system is over-charging the battery	Remove the other charging source, check its operation and charging voltage. Keep the charging voltage at or below the SSMPPT charging voltage.
4	array HVD	R – Y – G	PV input voltage above safe operating limit	Array input voltage exceeds operational ratings	Consult documentation for maximum array voltage. Keep array voltage below maximum rating. Be sure to take into account temperature effects on the array Voc.
5	DIP switch changed	R – Y – G	DIP switch changed while running	User changed a DIP switch during operation; DIP switch(s) not fully in on/off position; Dirt/Debris/Condensation	Return the DIP switches to original position or reset the PSMPPT so that the new changes take effect. Check all DIP switches to ensure they are in full 'on' or 'off' position. Inspect the PCB around the DIP switches for moisture, corrosion, debris
6	Custom settings edit	R – Y – G	EEPROM settings edited while running	A set point was changed via custom programing	Restart/power cycle to reset. MSView Coil Reset command may also be used.
7	RTS shorted	R/Y – G/Y	Short circuit detected in Remote Temp Sensor	The RTS cable has been pinched or otherwise shorted; The RTS terminal connections have collected dust/moisture and are causing an erroneous reading	Inspect RTS cable and connection; Inspect RTS terminals for dust/dirt/moisture and clean with alcohol if necessary
8	RTS disconnected	R/Y – G/Y	Remote Temp Sensor has been disconnected (was properly connected)	The RTS is no longer detected. Previously a valid RTS signal was present.	Inspect the RTS connection for loose wires. Inspect the RTS cable for breaks.
9	EEPROM retry limit	R – Y – G	EEPROM Communications Problem	Environmental noise causing on-board communications problems with EEPROM (long term memory); Hardware failure	Investigate if there is extreme environmental noise present in the vicinity of the TSMPPT. Reboot TSMPPT and see if Fault returns.; Contact distributor for service
10	Reset	R – Y – G	A power down reset has occurred	Controller has lost power	None required
11	Slave Control Timeout	R – Y – G	Slave mode charging control has timed-out	Loss of communications with controller; Controller has not received a slave command in over 60 seconds	Check physical communications connection to controller, check master device is still powered and sending commands; Check to make sure master device is configured to send slave commands at least once every 60 seconds
12	RS-232 Serial to Meter Bridge	R – Y – G	TS Meter reprogramming bridge mode failure	TS Meter not accepting firmware update	Retry, try different RJ-11 cable, try different TS Meter; Contact distributor for service.
13	Battery LVD		Battery voltage below minimum operating range, possible halt to charging possible	Battery Voltage below controller's minimum operating voltage	Consult documentation for minimum battery operating voltage. Resize system as necessary to prevent batteries drained below this minimum level.
14	unused			Hardware failure	Contact distributor for service
15	unused			Hardware failure	Contact distributor for service
16	Power-board communication fault		Communications between the power board and control board interrupted and retry limit exceeded	Various	If repeatedly showing this alarm after reboot, contact distributor for service.
17	Fault 17 (software)		Internal software error	Various	Contact distributor for service.
18	unused			Various	Contact distributor for service
19-22	Fault 19-22 (software)		Internal software error	Various	Contact distributor for service
23	FPGA Version		FPGA version not correct and could not be updated	Various	Contact distributor for service
24	Current sensor reference out of range		Input current sensor inaccurate and unreliable for correct operation	Hardware failure	Contact distributor for service
25-31	unused			Hardware failure	Contact distributor for service

Alarm

Bit	Alarm	Description	Causes	Solutions
0	RTS open	Remote Temp Sensor Disconnected (always set if no RTS connected)	RTS not connected	RTS not required for operation, RTS can be connected if desired for more accurate temperature compensated charging. See Fault: RTS shorted above.
1	RTS shorted	Short circuit detected in Remote Temp Sensor	RTS not connected	See Fault: RTS shorted above.