TS-MPPT-150V

Bit		Fault	LED Indication	Description	Causes	Solutions
0	1	overcurrent	R/Y – G	The charge or load current exceeds the controllers rating	PV Array is too large	Consult the TriStar documentation for maximum current ratings
1	2	FETs shorted	R – Y – G	MOSFETs shorted	The current sense circuitry is malfunctioning A power MOSFET is damaged An external short has occurred	TriStar Requires Service or replacement Refer to the TriStar MOSFET Replacement instructions Be sure the positive input/output power terminals are not wired together
2	3	software bug	R – Y – G	A software error has occurred in the processor	Solar input voltage too low This is an internal software problem	Ensure PV Voc is greater than battery voltage Update to latest firmware from the Morningstar website
3	4	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	5	array HVD	R – Y – G	PV input voltage above safe operating limit	Power MOSFETs may be shorted Array input voltage exceeds operational ratings	Contact distributor for service 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	6	DIP switch changed	R – Y – G	DIP switch changed while running	User changed a DIP switch during operation	Return the DIP switches to original position or reset the PSMPPT so that the new changes take effect.
					DIP switch(s) not fully in on/off position	Check all DIP switches to ensure they are in full 'on' or 'off position
					Dirt/Debris/Condensation	Inspect the PCB around the DIP switches for moisture, corrosion, debris
6	7	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	8	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	9	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	10	EEPROM retry limit	R – Y – G	EEPROM Communications Problem	Environmental noise causing on-board communications problems with EEPROM (long term memory)	Investigate if there is extreme environmental noise present in the vicinity of the TSMPPT. Reboot TSMPPT and see if Fault returns.
					Hardware failure	Contact distributor for service
10	11	Reset	R – Y – G	A power down reset has occurred	Controller has lost power	None required
11	12	Slave Control Timeout	R – Y – G	Slave mode charging control has timed-out	Loss of communications with controller	Check physical communications connection to controller, check master device is still powered and sending commands
					Controller has not received a slave command in over 60 seconds	Check to make sure master device is configured to send slave commands at least once every 60 seconds
12	13	RS-232 Serial to Meter Bridge	R – Y – G	TS Meter reprogramming bridge mode failure	TS Meter not accepting firmware update Hardware failure	Retry, try different RJ-11 cable, try different TS Meter Contact distributor for service
13	14	Current Offset	R – Y – G	Erroneous current reading when there should be zero current, could lead to inaccurate load and/or array current measurements	Failed current offset routine Damage to current measurement circuit	Reboot controller and allow sweep of array input. Check if Alarm returns Contact distributor for service
14	15	Battery HVD Max	R – G	Battery voltage exceeds high voltage disconnect threshold - halt in charging	See **Fault: battery HVD** above.	See **Fault: battery HVD** above.
15	16	unused				

Bit		Alarm				
0	1	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
1	2	RTS shorted	R/Y – G/Y	Short circuit detected in Remote Temp Sensor	See **Fault: RTS shorted** above.	See **Fault: RTS shorted** above.
2	3	RTS disconnected	R/Y – G/Y	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.

Bit		Fault	LED Indication	Description	Causes	Solutions
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		Heatsink High Temperature Warning, reduction of charging current	Poor airflow around controller	Ensure controller is mounted in a position with enough clearance on all sides. See manual for more information.
					Excessive ambient temperature	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 load and/or array current measurements	Failed current offset routine	Reboot controller and allow sweep of array input. Check if Alarm returns
					Damage to current measurement circuit	Contact distributor for service
8	9	Battery sense out of range	R/Y - G/Y	Battery sense voltage out of acceptable range	Disconnected wire on the Battery Sense	Inspect Battery Sense connection
					Greater than 5V difference between Sense and Battery Voltage	Inspect Battery sense wires and connection. Inspect Battery power cables and connection.
9	10	Battery sense disconnected	R/Y - G/Y	Battery sense was working, now out of range	Disconnected wire on the Battery Sense	Inspect Battery Sense connection
					Greater than 5V difference between Sense and Battery Voltage	Inspect Battery sense wires and connection. Inspect Battery power cables and connection.
10	11	Uncalibrated		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		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	See **Fault: Reset** above.	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.
21-23	22-24	unused				