

# **MANUAL, INSTALLATION AND CONFIGURATION, DTMAC<sup>TM</sup> ADVANCED TRACKER CONTROLLER**

Document Number:

**JULY 2013**

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REV.	ECO#	DESCRIPTION	DATE	AUTHOR
0		Preliminary Draft	05/03/13	RK Jupalli
1		Initial Draft Release	05/31/13	RK Jupalli
2		Revised Draft	07/03/13	RK Jupalli

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# DTMAC™ Advanced Tracker Controller

## INSTALLATION AND CONFIGURATION MANUAL



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1.1	Overview .....	5
1.2	Safety Procedures.....	6
1.2.1	Radio Frequency Safety .....	6
1.2.2	Electrostatic Discharge.....	7
1.2.3	Shock Hazards.....	7
1.2.4	Temperature Hazards .....	7
1.2.5	Handling Hazards .....	7
2.0	Configuring the DTMAC Tracker Controller.....	8
2.1	Mounting the Controller.....	8
2.2	Wiring the Controller .....	8
2.3	Connecting the East and West Branch Motor Cables .....	14
2.4	Smart Motor Configuration Procedure .....	14
2.4.1	Overview .....	14
2.4.2	Motor Configuration .....	14
2.5	Setting Parameters and Verifying Functionality .....	17
2.5.1	Setting System Parameters .....	19
2.5.2	Verifying Motor and Controller Wiring .....	27
2.5.3	Verifying Array Flatness.....	27
2.5.4	Verifying East and West Limits .....	28
2.6	Configuring a Computer for DTMAC Programming .....	29
2.6.1	Overview .....	29
2.6.2	Installing the DTMACterm Application .....	29
Appendix A:	PANID Decimal to Binary Switch Position Conversion Tables .....	33
Appendix B:	Remote Access Procedures.....	38
B.1	Overview of Control Interface and Capabilities.....	38
B.2	User Types .....	38
B.3	Accessing the SunPower DTMAC Controller Monitoring Application .....	40
B.3.1	Logging In .....	40
B.3.2	Viewing Site Information .....	46
B.3.2.1	Using the Main or Dashboard Tab Page .....	46
B.3.2.2	Using the Sites Tab Page .....	49
B.3.2.3	Using the Customers Tab Page .....	52

B.3.3	Viewing Network Information .....	55
B.3.3.1	Using the Main or Dashboard Tab Page .....	55
B.3.3.2	Using the Networks Tab Page.....	57
B.3.3.3	Using the Customers Tab Page .....	60
B.3.3.4	Using the Sites Tab Page.....	62
B.3.4	Viewing DTMAC Unit Information .....	63
B.3.4.1	Using the Main or Dashboard Tab Page .....	63
B.3.4.2	Using the Units Tab Page.....	66
B.3.4.3	Using the Networks Tab Page.....	69
B.3.5	Using the Graph.....	70
B.3.6	Viewing System Status .....	77
B.3.7	Viewing and Adding Controller Events .....	79
B.3.7.1	Viewing Controller Events .....	79
B.3.7.2	Adding Controller Events.....	80
B.3.8	Setting or Modifying Configuration Parameters.....	81
B.3.8.1	Using the Main or Dashboard Tab Page .....	81
B.3.8.2	Using the Units Tab Page.....	84
B.3.9	Sending Remote Updates.....	85
B.3.9.1	Using the Main or Dashboard Tab Page .....	85
B.3.9.2	Using the Units Tab Page.....	86
B.3.10	Stowing the Array and Setting the Nighttime Angle.....	87
B.3.11	Viewing Recent Updates.....	89
B.3.11.1	Using the Main or Dashboard Tab Page .....	89
B.3.11.2	Using the Units Tab Page.....	90
B.3.12	Viewing Messages .....	92
B.3.12.1	Using the Main or Dashboard Tab Page .....	92
B.3.12.2	Using the Units Tab Page.....	94
B.3.13	Viewing Alerts .....	95
B.3.14	Creating, Editing, and Deleting Customer Information .....	99
B.3.15	Creating, Editing, and Deleting Site Information.....	101
B.3.16	Creating, Editing, and Deleting Network Information.....	104
B.3.17	Assigning DTMAC Units .....	106

B.3.18 Editing and Deleting DTMAC Unit Information .....	110
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# 1.0 Introduction

## 1.1 Overview

The SunPower® Tracker features an embedded computer that controls the movement of the drive unit, which in turn rotates the torque tubes and optimally positions the CPV modules. The Distributed SunPower Tracker Monitoring and Control™ (DTMAC) Advanced Tracker Controller is programmed to optimize the angle of incidence between the sun and the modules. The DTMAC intelligently controls multiple trackers (16) to be synchronous at the same time.

The DTMAC controller has remote control capability that allows for stowing in adverse weather condition, equipment monitoring, and system optimization. Remote access procedures that enable monitoring and control of correctly installed and configured DTMAC units are described in Appendix B.

Here is an inside view of the DTMAC controller (Fig. 1):

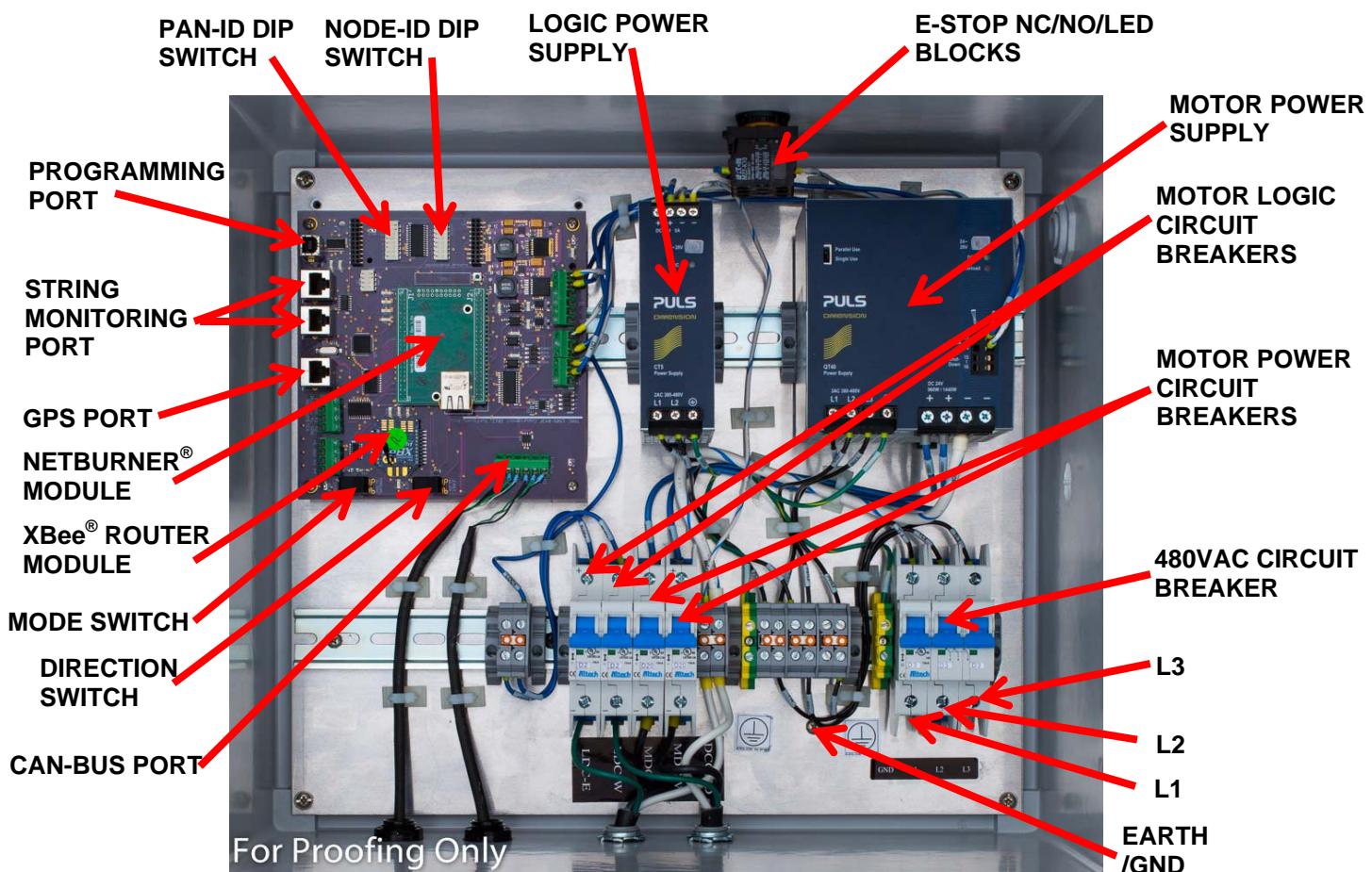


Fig. 1 Internal view of the DTMAC Solar Tracker Controller

## 1.2 Safety Procedures

**Important!** All personnel must adhere to the following safety procedures when working on the DTMAC controller. These wiring and configuration instructions are for use by qualified personnel only.

### 1.2.1 Radio Frequency Safety

- The DTMAC controller product is FCC and IC certified.
- The design of the DTMAC controller complies with the updated standards for safety levels with respect to human exposure to Radio Frequency (RF) emissions adopted by the Federal Communications Commission (FCC) in August 1996.

**FCC Notice 15.105:**

*This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.*

**FCC Notice 15.21:**

*Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment*

**IC CES-003 - CAN ICES-3 (B)/NMB-3(B):**

*This devices complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:*

1. *This device may not cause harmful interference;*
2. *This device must accept any interference received, including interference that may cause undesired operation of the device.*

*This product meets the applicable Industry Canada technical specifications.*

*Cet appareil est conforme à Industrie Canada une licence standard RSS exonérés (s). Son fonctionnement est soumis aux deux conditions suivantes:*

1. *Cet appareil ne doit pas provoquer d'interférences*
2. *Cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant provoquer un fonctionnement indésirable de l'appareil.*

*Ce produit est conforme aux spécifications d'Industrie Canada.*

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## 1.2.2 Electrostatic Discharge

**Warning!** Static charge buildup and discharge can damage the DTMAC controller.

To avoid static charge buildup or discharge into the equipment:

- Before touching or connecting a laptop to the DTMAC controller, SunPower recommends discharging the laptop and yourself by simultaneously holding your laptop and grounding yourself to a metal service that is connected to earth ground.
- Use a grounding mat when working on the DTMAC controller.
- Use a grounding strap when working on the DTMAC logic board.

---

## 1.2.3 Shock Hazards

**Warning!** Lethal voltages are present in the DTMAC controller box. SunPower recommends not carrying out work on or near an energized controller. If it's necessary to work on an electrically active controller, ensure that you use appropriate Personal Protection Equipment (PPE) at all times.

- The DTMAC controller is designed to operate at 380 VAC–480 VAC 3-Phase power. Other voltages are not compatible.
- The DTMAC controller is designed with finger guards to protect the user from electrical shock. However, SunPower requires that all personnel working on the equipment wear rubber insulating gloves.

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## 1.2.4 Temperature Hazards

**Warning!** The temperatures inside the DTMAC enclosure can go well above 70 degrees depending on the ambient temperatures. The surfaces inside the enclosure can be hot and care must be taken to let the enclosure cool down and the power must be shut-off before performing any kind of maintenance or installation operations.

- The DTMAC controller is designed to operate in the temperature range of -25 to +60 degrees C.

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## 1.2.5 Handling Hazards

**Warning!** The DTMAC product needs to be handled properly by able bodied personnel in order to move the product or during installation, as the product weighs 30lbs and can pose physical harm when dropped or not handled right. The product also has a hinged cover which needs to be secured before moving or installing the product.

- The handling and orientation of the DTMAC controller is provided on the field assembly sheets and in this document.

# 2.0 Configuring the DTMAC Tracker Controller

**Important!** Do not attempt to change any of the DTMAC controller's specified parameters. Doing so could dramatically alter system functionality and its ability to gather energy. Contact the DTMAC Monitoring team if you have questions about controller parameters.

You must wire the DTMAC controller and set the parameters so that the tracking functionality will execute properly. Once configured, new controllers are administered in the SunPower DTMAC Advanced Tracker Controller monitoring application to complete the commissioning procedure (refer to Appendix B).

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## 2.1 Mounting the Controller

The DTMAC needs to be mounted to the pier using the two clamps (Fig. 2) which come with the DTMAC packaging. Mount the DTMAC at the specified height from ground level and at the specified location on the pier, this information should be obtained from the project drawings. The DTMAC needs to be mounted vertical (Fig. 3) and it should be facing the geographical direction as specified in the project drawings.

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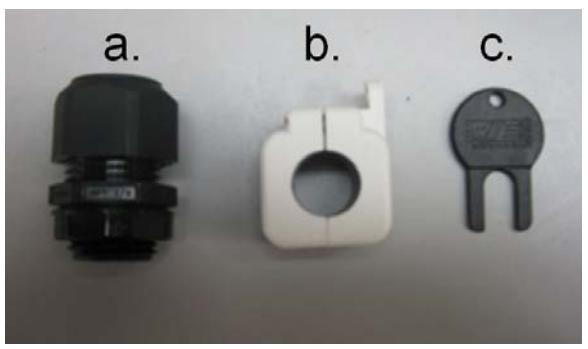
## 2.2 Wiring the Controller

Before performing the steps in this section, refer to the project drawings to identify the following:

- the controller designated as the “Coordinator” DTMAC for the network
- the controller to be installed with a GPS unit
- the mounting orientation of the DTMAC box and identifying the East, West branch motor wires
- the controller to be installed with a String Monitor connection.

These units have unique hole-drilling and wiring requirements.

Shipped separately, the DTMAC/TMAC Coordinator Upgrade Kit (SunPower part # 111437) contains components required for Coordinator conversion of the specified DTMAC unit and to facilitate GPS installation into another DTMAC:

<b>XBee® Coordinator radio chip</b> (enclosed in antistatic bag)	 A photograph of an XBee® Coordinator radio chip enclosed in a clear antistatic bag. The bag has yellow printed text that reads "HIGHSHIELD STATIC SHIELDING", "SENSITIVE DEVICES", and "LOT 83440 11/2008". The chip itself is blue with white and yellow markings.
<ul style="list-style-type: none"> <li>• <b>GPS unit</b> (with cable and modular jack)</li> <li>• <b>Cable gland</b> for the GPS cable</li> <li>• <b>GPS Magnetic Mount Kit</b> (with three attachment screws for the main unit)</li> </ul>	 A photograph showing the components of the GPS unit. It includes a black circular base plate, a larger black circular magnetic mount, a small black cable gland, and a black Ethernet cable with a modular jack.
a. <b>Cable gland</b> for the Ethernet cable b. <b>Snap-on Ferrite</b> c. <b>Ferrite Safety Key</b> (used to open the closed ferrite)	 A photograph showing three components labeled a., b., and c. Component a. is a black snap-on ferrite. Component b. is a white plastic ferrite with a central hole. Component c. is a black metal safety key with a notched end.

**Important!** To minimize the risk of damage to internal wiring and other components in the controller box, drill all necessary holes before attaching wire leads. To reduce fiber dust during drilling, SunPower recommends that you use a hole saw.

The DTMAC controller comes preassembled with the East and West motor wiring branches already attached.

To connect the wiring to the DTMAC controller:

1. Drill a hole of appropriate size for the input 480VAC power entry cable or conduit (as specified in the project drawings) approximately 4" (10 cm) to the right of the west branch motor cable entry (Fig. 4)
2. If the controller you are installing is not the designated Coordinator DTMAC or GPS unit, proceed to Step 6.
3. If the controller is the Coordinator DTMAC or the designated GPS unit, drill another hole to the left of the east branch motor CAN cable entry (Fig. 5) according to the following requirements:
  - If the controller is designated as the GPS unit:  
Drill a hole 7/8" (22 mm) in diameter for the GPS cord grip (Fig. 5) contained in the DTMAC Coordinator Upgrade Kit.
  - If the controller has a string monitor board connection drill a hole 7/8" (22 mm) in diameter 2" (5 cm) above and 2" (5 cm) to the right of the east branch motor CAN cable entry for the string monitor cord grip (Fig. 6)
  - If the controller is the Coordinator DTMAC:
    - a. Refer to the electrical wiring diagram to determine if an outdoor rated Cat 5 Ethernet cable or a specified conduit fitting is to be installed for Internet connectivity.
    - b. If Cat 5 Ethernet cable is to be used, drill a hole 7/8" (22 mm) in diameter for the cable gland (included in the kit); if conduit fitting is to be used, drill a hole of appropriate size for the conduit that serves as the raceway for the Ethernet cable (Fig. 5).

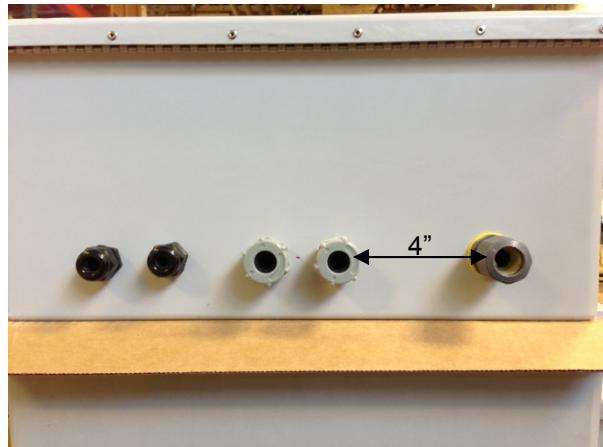


Fig. 4

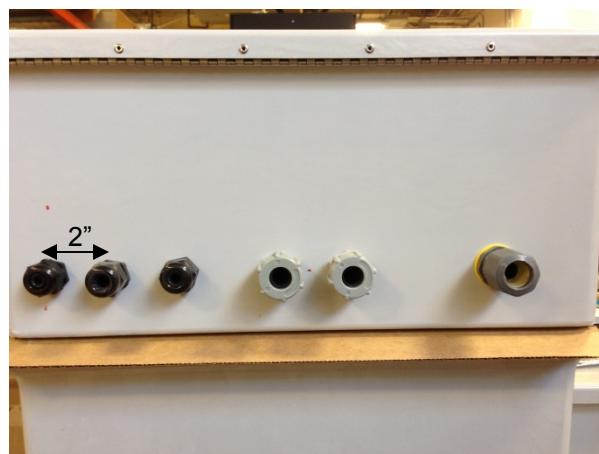


Fig. 5

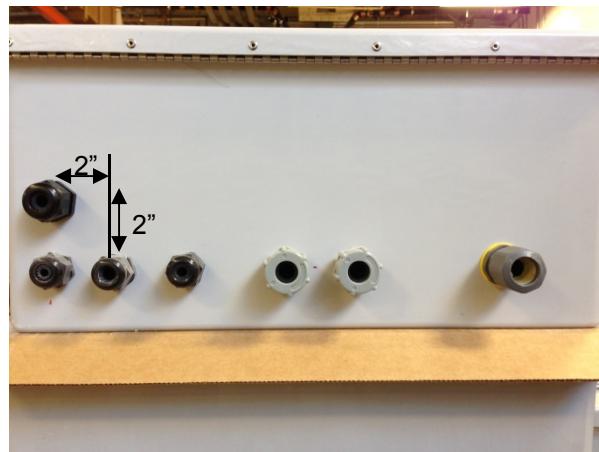


Fig. 6

4. Install the cable or conduit fitting for the power entry wiring provided at the site.

Bring the 3-phase power entry leads out of the fitting and then land the **L1**, **L2**, and **L3** leads, on the correct terminals of the circuit breaker (Fig. 7, Marked in a Red box). A black label under the circuit breaker identifies the terminal locations. The **GND** wire must be terminated with a 10-32 ring terminal and mounted at the grounding stud location. The grounding stud is marked with the appropriate label.

**Important!** Ensure that you land the wires on the correct terminals.

**Note.** There should be ferrules installed on the power wires.

5. Apply 25 in-lbs (2.8 N-m) torque to all of the recently attached terminals while securely holding them against the terminal blocks. Firmly pull on the wires to make sure that all are securely attached.

Only perform Step 6 on the controller designated as the GPS unit.

6. To install the GPS cable:

- a. Install the cord grip into the hole for the GPS cable (to the right of the inclinometer hole).
- b. Hand-tighten the locking nut until it is flush against the inside wall of the enclosure and then tighten 1/6 turn with a wrench.
- c. Feed 12" (30.48 cm) of the GPS cable through the mounted cord grip.
- d. Tighten the cord grip dome until it is flush with the fitting and in contact with the gland base.
- e. In the box, route the cable between the lower right PCB standoff and the enclosure wall. Route the cable counterclockwise around the lower standoff and under the PCB. From underneath the PCB, route the cable to the topside (Fig. 8). Use the cable holders which come with the DTMAC packaging to secure the cable to the back panel and to route the cable.
- f. Insert the RJ45 plug into the modular jack labeled **RJ3-GPS** (Fig. 8).

Only perform Steps 7–8 on the controller designated as the Coordinator DTMAC.

7. To install the Ethernet cable:

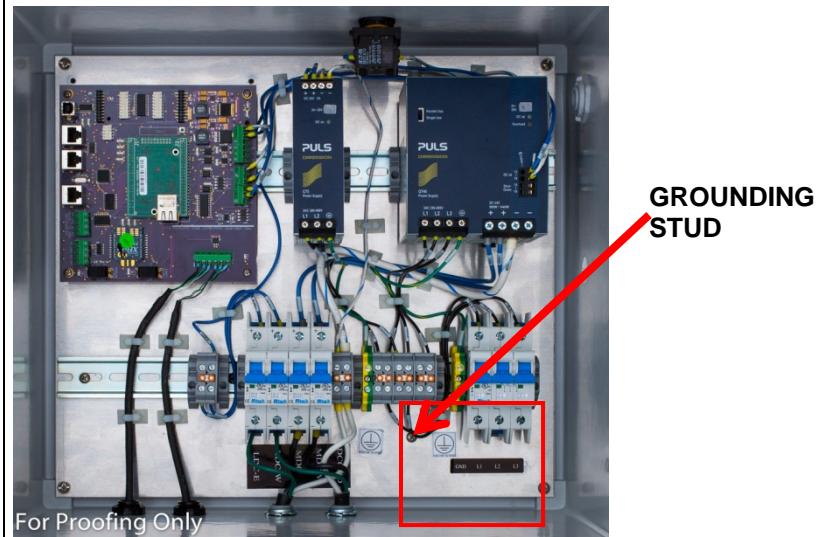


Fig. 7

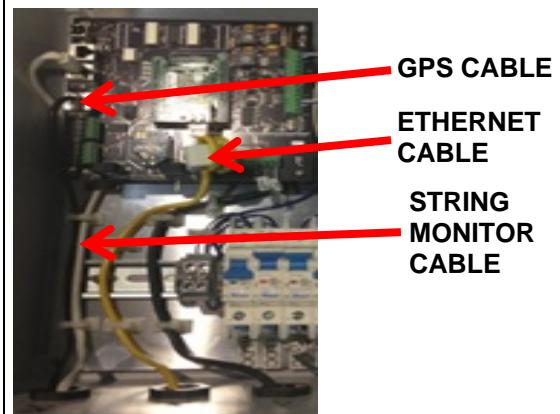


Fig. 8

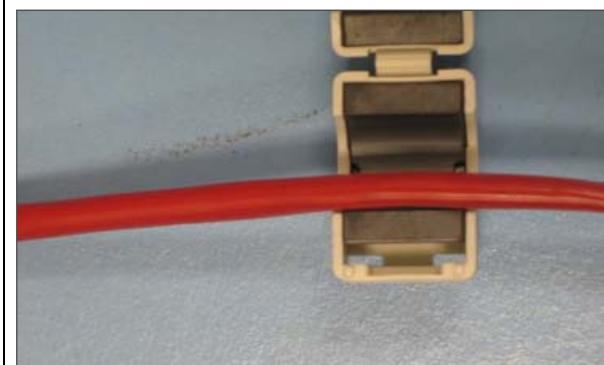


Fig. 9

Install the cord grip (if being used) into the hole to the right of the east branch motor CAN cable entry hole. Hand-tighten the locking nut until it is flush against the inside wall of the enclosure and tighten 1/6 turn with a tool.

If conduit is being used, install the fitting similarly but tighten 1/2 turn with a tool.

- a. Feed the Ethernet cable through the SunPower provided cable gland (or conduit—in which case the gland is not needed) and route the cable between the front standoff and the enclosure wall (Fig. 8).
- b. Coil any excess cable and restrain with the cable holder or zip tie to maintain isolation from the power circuits in the enclosure.
- c. Continue to route the cable underneath the PCB and to the left side of the upper right standoff (not between the upper standoff and enclosure wall), and then bring the cable to the topside of the PCB (Fig. 8).
- d. Wrap the cable three times around the snap-on ferrite (Fig. 9, and Fig. 10) so that when finished less than one inch of cable protrudes between the ferrite and the plug end (Fig. 11).
- e. Insert the cable end into the modular jack on the NetBurner® module (Fig. 12).

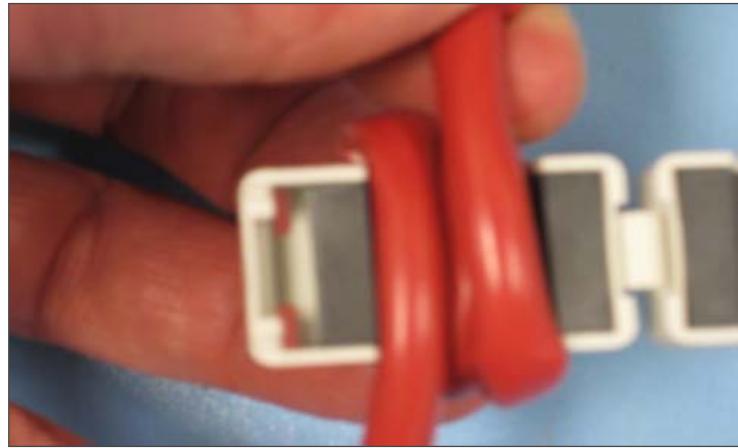


Fig. 10

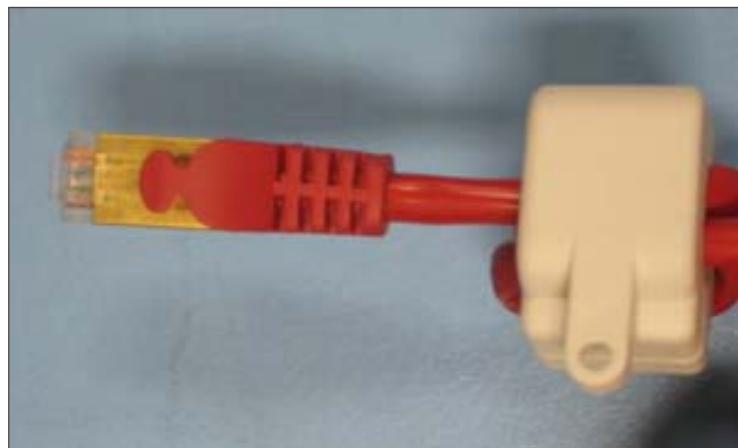


Fig. 11



Fig. 12

8. To install the Coordinator radio chip:

- Remove the factory-installed XBee® router module (Fig. 13).

Place an index finger against the router module's edge between the DIRECTION and MODE switches and other index finger against the opposite edge near the NetBurner® module. With a slight back and forth rocking action, slowly lift the pins out of the socket a small amount each time (Fig. 14).

**Important!** Ensure that you handle the router module carefully to avoid damaging the antenna attached to the PCB.

- Check that the antenna is perpendicular to the PCB. Carefully straighten the antenna if needed.
  - Remove the XBee® Coordinator radio chip from the antistatic bag and position it over the socket.
  - Make sure that all of the module pins are aligned with the pin receptacles of the socket (Fig. 15), and *not* shifted over by one pin
  - With a slight back and forth rocking action, firmly press on both socket rows simultaneously.
  - Verify that all module pins are directly over the pin rows of the socket strips (Fig. 15). The module's physical shape should directly coincide with the outline on the PCB silkscreen overlay. Tug on the wires gently to ensure that they are properly seated.
9. Check all installed cables before closing the enclosure



Fig. 13

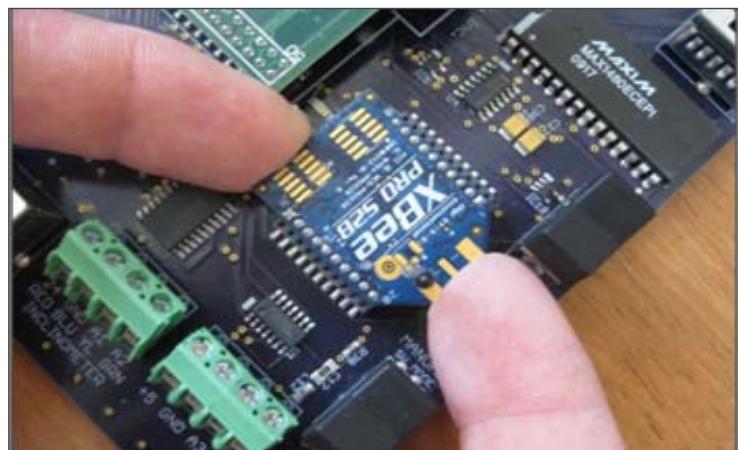


Fig. 14

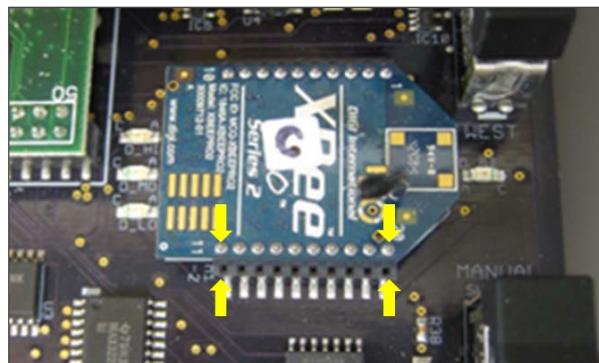


Fig. 15

## 2.3 Connecting the East and West Branch Motor Cables

There is 1 pair each of the East and West branch motor cables already attached to the DTMAC controller. These cables have connectors already installed at the external end and need to be connected to the East and West branch extension cables and to the DC smart motor as per the project drawings.

**Warning!** The power should be turned OFF at the DTMAC controller by switching the respective circuit breakers (to which these cables are connected inside the DTMAC controller) to the OFF position, before connecting these cables to either the motor or the East and West branch extensions.

## 2.4 Smart Motor Configuration Procedure

The DC Smart motor needs to be pre-configured in order to communicate properly with the DTMAC system..

### 2.4.1 Overview

In order for the TMAC system to function properly each of the 16 motors must be leveled to a reference tracker surface datum, given a node ID based on the position in the array of 16 trackers, and have the full operational range verified. Because this does not require communication with the DTMAC it can be done independently at the tracker using a PC with a software tool (or skilled operator) that compares a temporary reference sensor to the motor sensor.

### 2.4.2 Motor Configuration

In order for the PC to command the motor, the CANbus Y-connector on the motor must be unplugged and the cable from the PC used in its place. If field power is active the motor power cable can remain in place – otherwise a mobile 24V supply is required to power up the motor during commissioning.

The PC is used to command the motor to drive to a position where the reference sensor is level ( $0^\circ$ ) and then a command is issued for the motor to reset the internal sensor to zero. Due to the use of a hysteresis value when tracking, the motor must be at least  $0.15$  deg away from a reference point in order for the motor to attempt a repositioning move. For this reason the motor is first commanded to drive to  $+1$  deg.

When the motor resets the inclinometer, the setting is stored in non-volatile memory in the sensor and will not be lost if the power is cycled. A safety feature integrated in the motor firmware will prevent the reset from occurring if the angle of the internal sensor reads more than 2 degrees. If the reset is attempted beyond 2 degrees the motor will go into an error state and store the value -20005 in the motor error register (0x3001.0). Figure A shows a schematic of a potential automated system that an operator can start with a few clicks from an interface along with the sequence of commands to level the motor. Table 1 lists the logic and communication steps required for an automated or manual process.

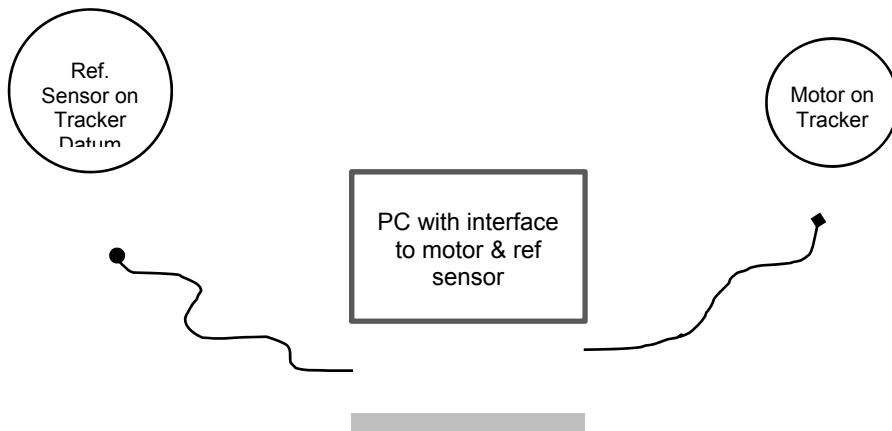


FIGURE A: Automated motor commissioning system tool.

TABLE 1: Motor commissioning steps.

Description	Motor Command or Operation	Step
Operator clicks on “Commission Motor”	Interface button	1
Ask operator if motor is new (ID =127) or motor is being re-leveled (old ID must be given for re-leveling)	User interface input OLDorNEW variable set If OLD, Store motor ID as MOTOR_ID	2
Tracking command sent to motor	SDO-W, NodeID=127, 0x5101.1, 0x05	3
Motor given setpoint (SP) of +1 deg	SDO-W, NodeID=127, 0x5105.1, 100	4
Monitor motor register MY_STATUS to know when SP reached.	SDO-R NodeID=127, 0x5102.1 MY_STATUS register will go from 3 up to 6 or 8 then return to 3 when position reached	5
When SP reached, Read ref sensor angle value	Reference sensor read by PC	6
Read motor sensor angle	SDO-R, NodeID=127, 0x5103.1	7
Calculate: Motor - Ref = Reset SP	Operator or GUI calc...	8
Motor given a setpoint = Reset SP	SDO-W, NodeID=127, 0x5105.1, RSP	9

Monitor MY_STATUS to confirm SP reached (Alternative monitor motor velocity for return to zero)	SDO-R NodeID=127, 0x5102.1  MY_STATUS register will go from 3 up to 6 or 8 then return to 3 when position reached	10
Read ref sensor value, check if abs value <0.05 deg, <b>ELSE</b> return to step 4	Operator or GUI logic check...	11
If step 11 is true, issue motor inclinometer reset command	SDO-W, NodeID=127, 0x5101.1, 0x02	12
Check motor error status <b>after 3 sec</b> <b>IF</b> error status = -20005, leveling was attempted beyond 2° range. Operator must check system, then click "Clear error" button to reattempt leveling starting at step 3.	SDO-R, NodeID=127, 0x3001.0	13
Reset motor to clear system	Power cycle with cable or via the following SDO write sequence:	14
<b>IF</b> this was a new motor (See step 2), Ask operator for block & tracker number in order to assign proper Node ID (1-16) <b>ELSE</b> : Leveling complete, end routine	User interface input	15
Check if block and tracker number valid: between 1&16, no duplicates. If valid and different by more than 1 from previous tracker ask user to verify.	Software check	16
Command motor to reassign node ID	SDO-W NodeId_old, 0x2000.1, 0x6E657277  SDO-W NodeId_old, 0x2000.2, NodeId_ <b>new</b>  Response may require 2 sec.  Reset device afterwards:  SDO-W NodeId_ <b>old</b> , 0x2009, 1, 0x6E657277  SDO-W NodeId_ <b>old</b> , 0x2009, 2, 0x9999	17
Save Preset value, RSP, with tracker and block number to record file	Software operation	18

After the motor is leveled and given a proper node ID, the full range of motion must be verified. If there is any blockage in the system (such as the hard stop in the slew drive) the motor will likely error out with -4000 (check error register 0x3001.0). The error must be cleared before the motor will move again. If a hard stop is hit at one of the maximum extents the motor maximum angle must be changed to prevent repeated errors. Resetting the max motor angle requires a motor MPU firmware update (see Dunker “Project description file”).

The full operational range test is best performed via the TMAC jog switches as it takes a considerable amount of time for the motor to complete the 300 degree path while moving at a controlled speed of 4 deg/min (stow to +75 to -75 to stow). Both max positive and negative rotation positions should be verified using the jog switches. Trackers that hit the hard stop should be fine to rotate to the opposite max extent. Any hard stop hits will be clearly distinguishable by the orientation the tracker is stuck at when the DTMAC jog switch is cycled back to stow.

## 2.5 Setting Parameters and Verifying Functionality

After you install the DTMAC controller, you must assign the controller a node address, level the system, verify east and west tracking limits, and enter other operational parameters. You must assign a node address, perform the verifications, and enter the parameters for each DTMAC controller on the site. Once entered, the data is stored in the non-volatile memory of the DTMAC through an update command.

**Important!** The GPS device installed in designated DTMAC controllers enables the controller to acquire the longitude, latitude, and time, and to wirelessly provide the information to the Coordinator DTMAC. The Coordinator DTMAC then transmits the data to all controllers in the network. Configure the Coordinator and DTMAC GPS units first so these data can be available as other controllers are configured. A DTMAC controller without time information will not run in **Auto** mode.

**Note.** DTMAC controllers installed with GPS units are usually assigned node address **NODEID 1**.

You set system parameters by connecting a laptop to the DTMAC controller. The laptop you connect must have the DTMAC term application installed. The DTMAC term application enables easy configuration of the DTMAC and quick verification of system functionality.

**Important!** The laptop you use must be configured for DTMAC programming. Refer to Section 2.5 for the configuration procedure.

Here is a closer view of the DTMAC controller logic board (Fig. 16):

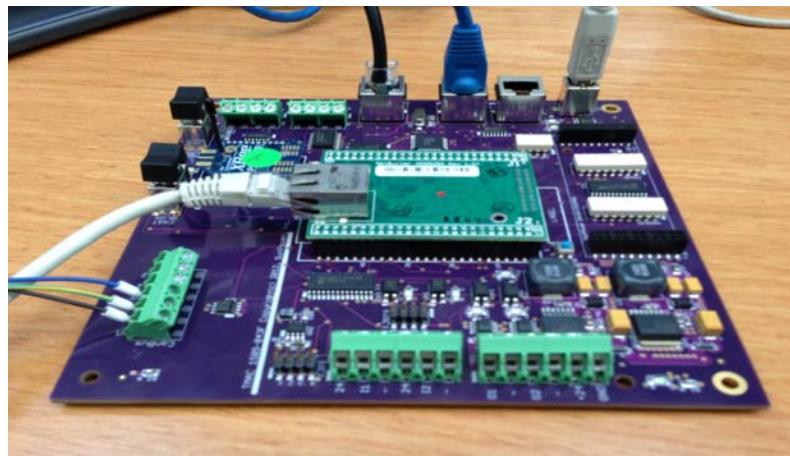


Fig. 16 DTMAC Tracker controller PCB

The state of the DTMAC controller can be manipulated with two 3-position rocker switches: the MODE Switch and the DIRECTION Switch.

The DTMAC controller has three primary operating modes, activated with the MODE Switch:

- **AUTO Mode** (the middle or neutral position) runs the motor to drive the array that maximizes system power output (the controller computes the sun's position and moves the array accordingly)
- **MANUAL Mode** enables the position of the array to be manually adjusted using the DIRECTION Switch:
  - **EAST** (up) runs the motor to tilt the panels to the east
  - **OFF** (the middle or neutral position) turns the tracker motor off
  - **WEST** (down) runs the motor to tilt the panels to the west

There is a time delay enforced if the DIRECTION Switch is too rapidly moved.

- **STOW Mode** runs the motor to the preconfigured 'flat' position

**Important!** Before setting parameters, refer to the project drawings to identify the designated Coordinator DTMAC unit for the network you are configuring. The Coordinator DTMAC unit, located at the closest inverter station, is hardwired with Ethernet cable to the site access point (refer to Section 2.2, Step 7). Verify that the unit has the XBee® Coordinator radio chip (marked with a "C", Fig. 17) instead of the factory-installed XBee® router module (refer to Section 2.2, Step 8).



Fig. 17

## 2.5.1 Setting System Parameters

Power on the controller and verify that the LED marked **D\_3V** near the power supply is lit.

To set the system parameters for each DTMAC controller:

1. Power down the controller.
2. Refer to the project drawings for the following:
  - Network Address (PANID) – the address of this group of DTMAC units
  - Node Address (NODEID) – the address of the DTMAC being configured
3. Put the MODE Switch in the **MANUAL** position.
4. Referring to the Individual Tracker Information Table, perform the following steps on the DTMAC address switches:
  - a. Set the **PANID** Switch:

All of the controllers in a network have the same PANID. Set *all* of the units in that group to that same PANID using the following table to convert from PANID decimal to binary switch position.

PANID Number (Decimal)	Binary Switch Position
1	00000001
2	00000010
3	00000011
4	00000100
5	00000101
6	00000110
7	00000111

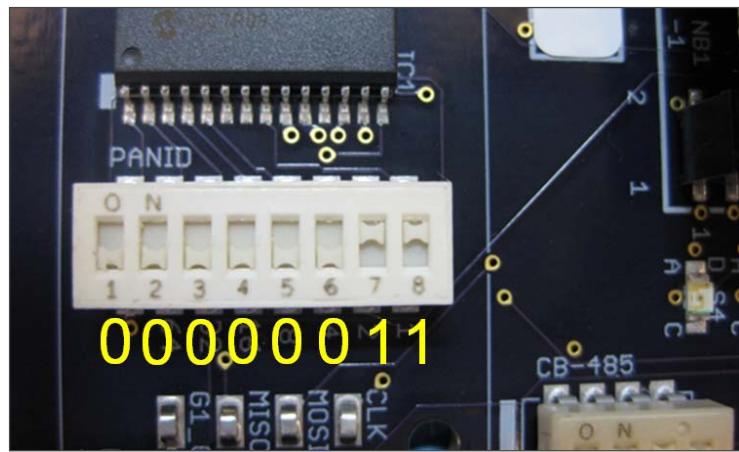


Fig. 18

8	00001000
9	00001001
10	00001010

The rightmost digit in the **Binary Switch Position** value corresponds to the rightmost binary switch (labeled **8**). The “up” position (towards **ON**) of each switch represents a binary **1**, and the “down” position a binary **0** (Fig. 18).

For example, the **PANID Switch** is set to **00000011** on a controller that belongs to a network with **PANID 3** (Fig. 18).

**Important!** To convert PANID decimals 11 to 255 to binary switch position, refer to Appendix A.

b. Set the **NODEID** Switch:

- On the Coordinator DTMAC unit, set the **NODEID** binary switches to **00000000** (all switches down).
- For all of the remaining DTMAC units within this PANID, consult the project drawings for each controller’s assigned NODEID. Refer to the following table to convert from NODEID decimal to binary switch position.

The individual **Binary Switch Position** value correlates with the individual switch positions as you go from left (switch **1**) to right (switch **8**) (Fig. 19).

NODEID Number (Decimal)	Binary Switch Position
1	00000001
2	00000010
3	00000011
4	00000100



Fig. 19

5	00000101
6	00000110
7	00000111
8	00001000
9	00001001
10	00001010

For example, the **NODEID** Switch is set to *00000101* on the controller that is assigned *NODEID 5* (Fig. 19).

5. Use the USB-A to USB-B cable assembly to connect the laptop to the controller through the **Programming Port**.

6. Start the DTMAC term application.

Note: For Windows 7 users, one need to have UAC disabled on their system in order for the virtual COM port drivers to be installed by the DTMAC.

7. The DTMAC term Select serial port screen opens (Fig. 20):

- Select the serial port number being used by your computer for DTMAC term and then click **OK**. Skip Steps 8–11 and proceed to Step 12.
- To determine the serial port number being used by your computer for DTMAC term, perform Steps 8–10.

Perform Steps 8–10 the first time you connect the computer to a DTMAC controller.

**Note.** If in future the USB port is used to connect the computer to another device, it may be necessary to perform these steps again the next time you connect your computer to a DTMAC controller.

8. Navigate to Start, Settings, Control Panel, System.

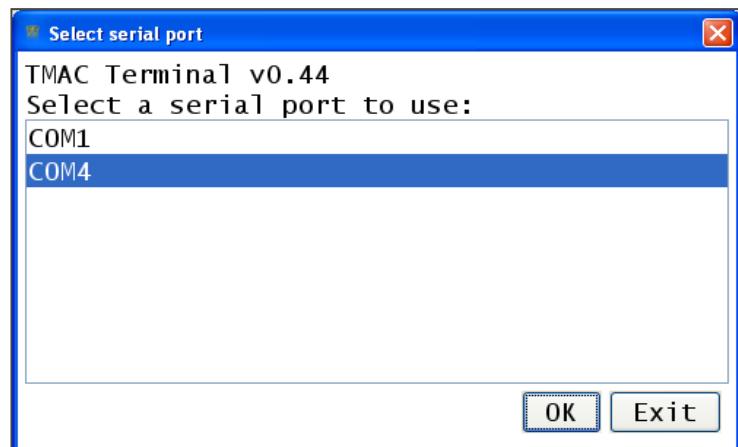


Fig. 20

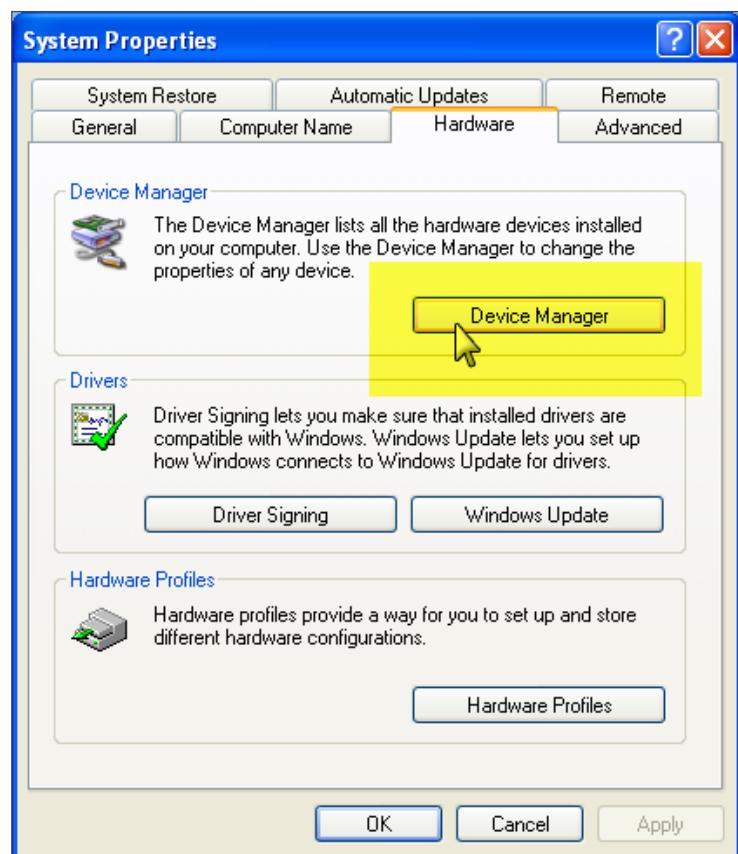


Fig. 21

9. In the System Properties window, click the Hardware tab and then the Device Manager button (Fig. 21).
10. In the Device Manager window, scroll down the list until *Ports (COM & LPT)* is found. Expand that entry and look for *USB Serial Port (COM?)* (Fig. 22). The ? (question mark) is the port number being used by your computer for DTMAC term (in this case, *COM4*).
11. Return to the DTMAC term Select serial port screen and select the COM port identified. Click *OK*.
12. The DTMAC term main screen appears with a dialog box that says '*Unable to establish communication with DTMAC*'. Disregard the message and click the *OK* button. Note that the only activity present is the *Sent* counter at the bottom of the window (Fig. 23).
13. Turn on the DTMAC circuit breaker.

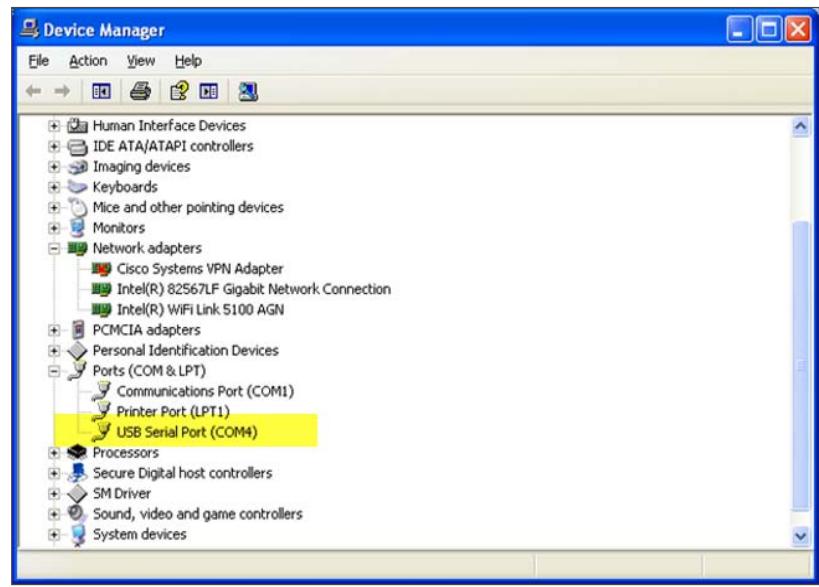


Fig. 22

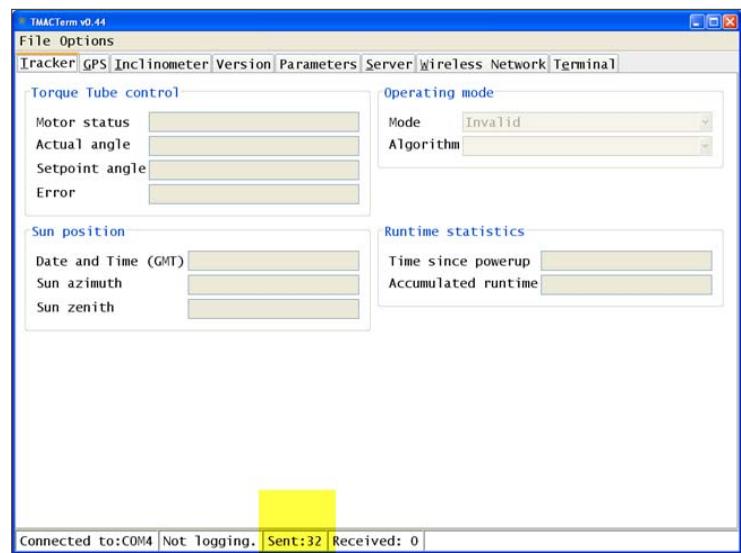


Fig. 23

In the DTMACterm main screen, a message 'Can't parse firmware version' may appear but it can be ignored.

After the DTMAC boots up it may not find time and date information yet. Note that the Received counter value indicates the number of messages that the DTMACterm has received from the DTMAC (Fig. 24).

Fields under **Operating mode** indicate when the DTMAC has fully booted in **Manual** mode (Jog) and the GPS has been read (Fig. 25). Other DTMAC units will get their time information wirelessly from either the GPS unit or from the Coordinator DTMAC which gets the time from an Internet clock. The **Motor status** error is normal when the DTMAC is in **Manual** mode (Fig. 25).

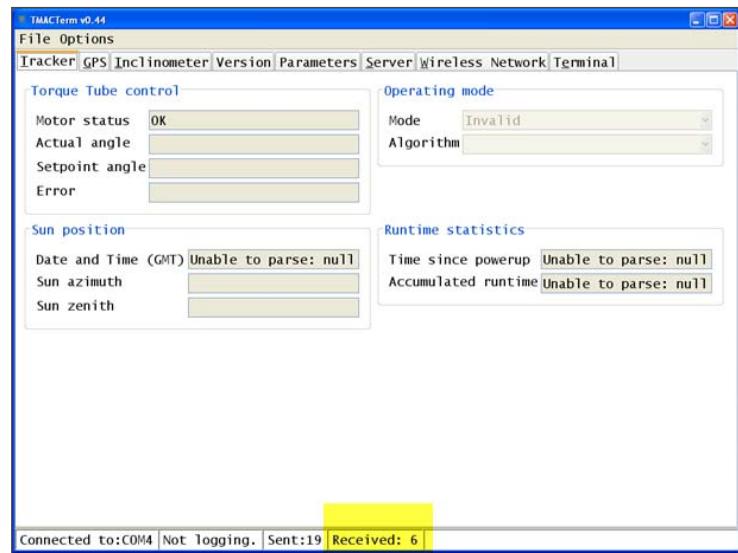


Fig. 24

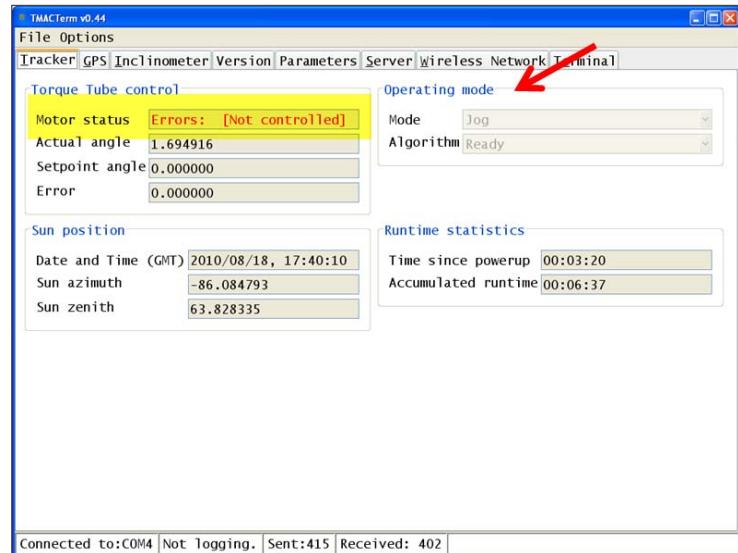


Fig. 25

14. Click the **Wireless Network** tab in the **File Options** bar.
15. In the Wireless Network screen, verify that the **PAN ID** and **Node ID** values under **Local wireless status** are the PANID and NODEID decimals, respectively, specified in the project drawings (Fig. 26).
16. Click the **Parameters** tab.
17. In the Parameters screen, enter (or select) and verify parameter values:
18. Enter (or select) the parameter values indicated in the project drawings in the **Position settings** and **Site parameters** fields (Fig. 27).

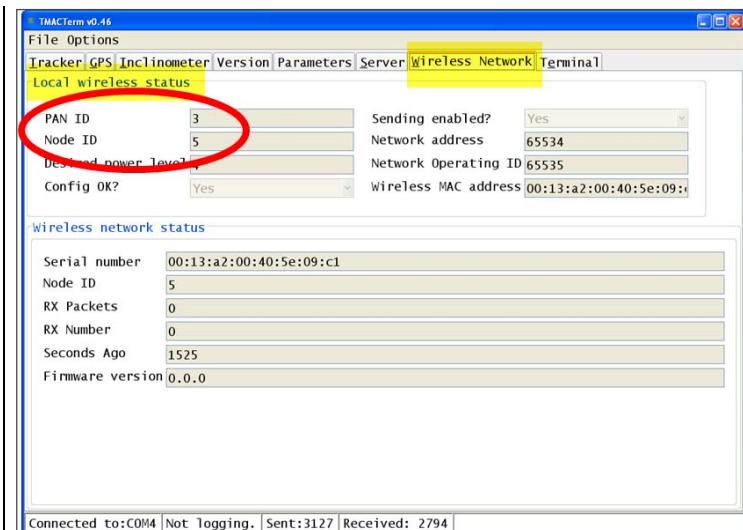


Fig. 26

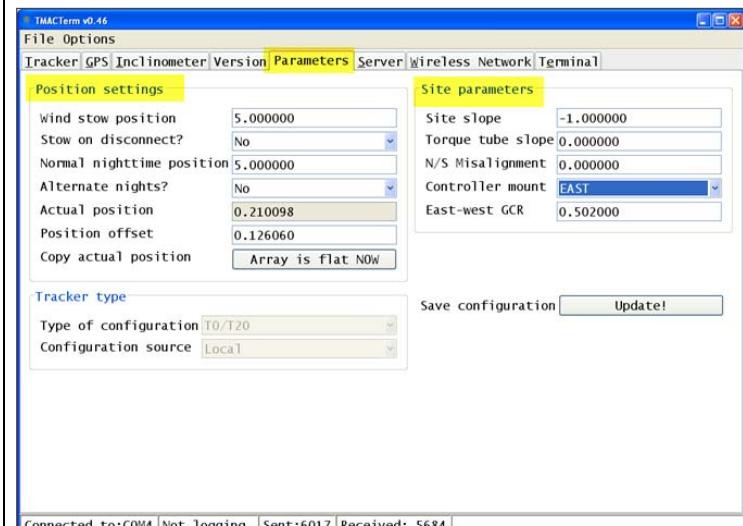


Fig. 27

To view the description or details of a field, position your cursor over the field title (Fig. 28).

19. Verify the **Site slope**, **Torque tube slope**, and **East–West GCR** values.

- Measure the site slope and torque tube slope using a digital inclinometer. Measure the E–W GCR using a tape measure.
- Compare the measurements with the values in the **Site slope**, **Torque tube slope**, and **East–West GCR** fields. If the difference between the measured value and the entered value is less than 1%, proceed to the next step. If the difference is 1% or greater, contact the DTMAC Monitoring team.

20. When all the parameter values have been entered and verified, click the *Update!* button.

21. A confirmation dialog box appears. Click *OK* (Fig. 29).

22. To test the entered data:

- a. Power down the controller with the DTMAC circuit breaker.
- b. Close DTMAC term and then re-launch the application after several seconds.
- c. Wait 10 seconds before powering the controller back up.
- d. At the DTMAC term main screen click the **Tracker** tab and then click the **Parameters** tab. Verify that the correct values are stored in the Parameters screen.

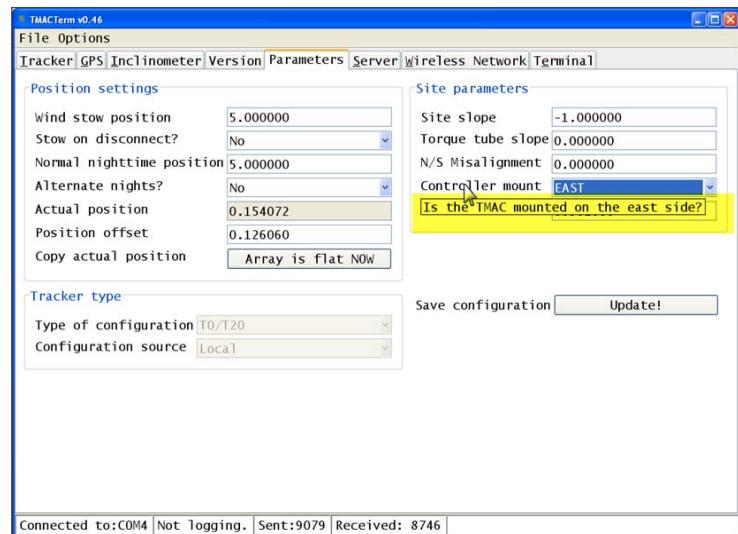


Fig. 28



Fig. 29

23. Before closing the controller box, verify that all LEDs (**D\_S1**, **D\_S2**, **D\_S3**, and **D\_S4**) on the DTMAC PCB are not lit. All LEDs should be off; otherwise, the DTMAC will not operate correctly.

When lit, the **D\_S1** LED indicates that the controller is in **Stow** mode; if flashing at 1Hz, the DTMAC is in **Manual**.

If the **D\_S2** LED is flashing, it indicates that the motor is not under control. Several problems can cause this condition:

- the motor failed to track
- there is no valid time in the DTMAC
- there is no valid feedback
- the temperature in the DTMAC enclosure is too high, that is, greater than 70° C

The **D\_S3** and **D\_S4** LEDs are reserved for future use. However if both LEDs are lit, either there is no software loaded on the Netburner® module or the DTMAC PCB failed.

Refer to the *DTMAC Troubleshooting Guide* for more information.

24. Call or send an email to the DTMAC Monitoring team to complete the commissioning procedure and enable remote control and monitoring for the site. Provide the site name and location, and network configuration data indicated in the project drawings.

**Note.** You are not required to perform this last step onsite unless instructed otherwise by the DTMAC Monitoring team.

---

## 2.5.2 Verifying Motor and Controller Wiring

1. With the controller box powered down and the door open, turn the MODE Switch to **MANUAL**. Power up the controller by turning the circuit breaker on.
2. Turn the DIRECTION Switch to **EAST**. The modules should begin rotating to the east.

If instead the modules rotate west, verify that the correct mount (EAST or WEST) for the installation is selected in the DTMAC Parameters screen (refer to Section 2.4.1, Step 19). If **WEST** is selected in the **Controller mount** field and the modules still rotate west, inspect the controller's power terminal blocks and the motor's wiring for reversed polarity. Contact SunPower if the wiring for the controller or motor appears incorrect or not according to the electrical wiring diagrams.

3. Turn the DIRECTION Switch back to OFF (the middle position, neither **EAST** nor **WEST**).

---

## 2.5.3 Verifying Array Flatness

A Tracker array is considered “flat” when its modules are at a tilt angle of 0°.

1. Turn the MODE Switch to **MANUAL**.
2. Turn the DIRECTION Switch to the **EAST** or **WEST** positions as necessary to move the modules to a visually horizontal (flat) position.
3. Use an auxiliary digital inclinometer to measure one of the modules at the center of the first row (or place your level E-W, across a fairly even, stable module near the drive strut on the first row), and then use the DIRECTION Switch again to manually move the array, until the auxiliary inclinometer (or level) reads exactly level (or 0° +/- 0.1°).
4. In the DTMAC term screen, click the **Parameters** tab. Click the *Array is flat NOW* button.
5. Click the *Update!* button and then click *OK* in the confirmation dialog box.

---

## 2.5.4 Verifying East and West Limits

**Warning!** During the following procedure, ensure that you closely observe the movement of the modules so that you can use the switches to manually stop the motion if the modules do not stop at 75° or if there is risk of damage.

1. Turn the MODE Switch to **MANUAL**.
2. Turn the DIRECTION Switch to **EAST**.
3. Verify that the modules begin rotating to the east.
4. The modules will eventually stop rotating (this will take approximately 22 minutes if the modules were flat when you started jogging east). Use a digital inclinometer to verify that the module directly above the controller inclinometer is at  $75^\circ \pm 2^\circ$ . If the angle of the module directly above the controller inclinometer is not  $75^\circ \pm 2^\circ$ , you must replace the controller inclinometer. Contact SunPower.
5. Turn the DIRECTION Switch to **WEST**.
6. Verify that the modules begin rotating to the west.
7. In approximately 45 minutes the modules will stop. Use a digital inclinometer to verify that the module directly above the inclinometer is at  $75^\circ \pm 2^\circ$ . If the angle of the module directly above the controller inclinometer is not  $75^\circ \pm 2^\circ$ , you must replace the controller inclinometer. Contact SunPower.
8. Return the DIRECTION Switch to OFF (middle position, neither **EAST** nor **WEST**).
9. Turn the MODE Switch to **AUTO**. The controller will automatically begin driving the modules to the optimal position for collecting solar energy. If it's early morning or late afternoon, do not be alarmed if the tracker starts moving to the nighttime (stow) position. Observe the AUTO mode behavior for ten minutes to ensure that the controller parameters are stable.

The Tracker is now operational.

## 2.6 Configuring a Computer for DTMAC Programming

Computers used for DTMAC programming must be preconfigured. If the laptop you are using is not preconfigured, perform the steps in this section.

### 2.6.1 Overview

Specific software application and hardware enable a computer to communicate with the DTMAC controller:

Software Requirement	Hardware Requirements
DTMAC term application	<ul style="list-style-type: none"><li>Laptop with USB connection capabilities</li><li>USB male A plug to male B mini plug cable</li></ul>

DTMAC term is a SunPower-provided custom application for computer-to-DTMAC communication. A USB/RS232 conversion radio chip is used on the DTMAC PCB to communicate to a computer through the **Programming port**.

If you have DTMAC term installed on your computer but the application fails to run, uninstall the application using the FTClean - Driver Removal Utility and then re-launch the DTMAC term Setup Wizard to install/update/repair the application. To download and extract the **FTClean - Driver Removal Utility** zip file, navigate to the FTDI Utilities web page <http://www.ftdichip.com/Support/Utilities.htm>. The FTClean - Driver Removal Utility must be run with Internet connection.

### 2.6.2 Installing the DTMACterm Application

The DTMAC term application is available online through an internal URL. The installer installs both the DTMAC term software and the required FTDI driver.

1. Enter <http://devDTMAC02/setup.msi> in your web browser.
2. Click *Run* in the File Download - Security Warning dialog box (Fig. 30).

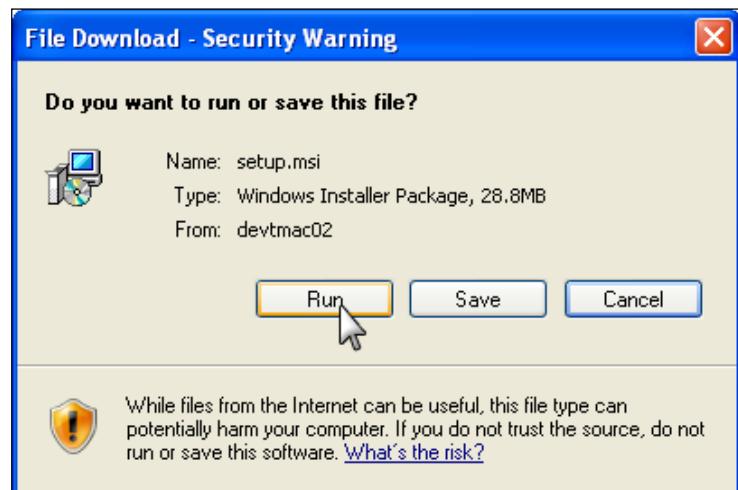


Fig. 30

3. The DTMAC term Setup Wizard launches.  
Click *Next* (Fig. 31).

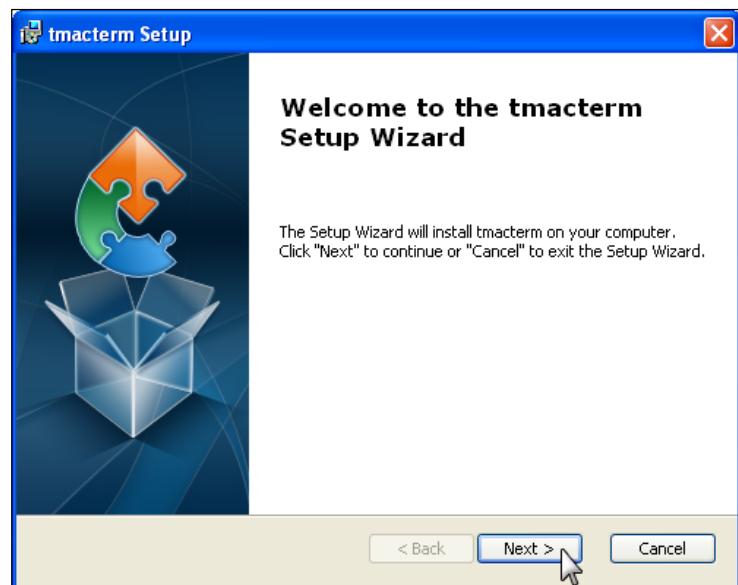


Fig. 31

4. Select the folder where you want DTMAC term installed and click *Next* (Fig. 32).

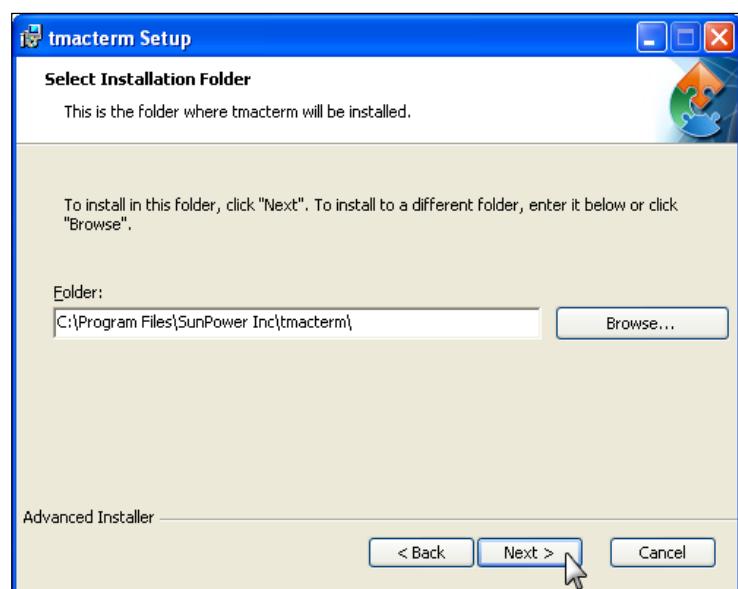


Fig. 32

5. Click *Install* to begin the DTMAC term installation (Fig. 33).

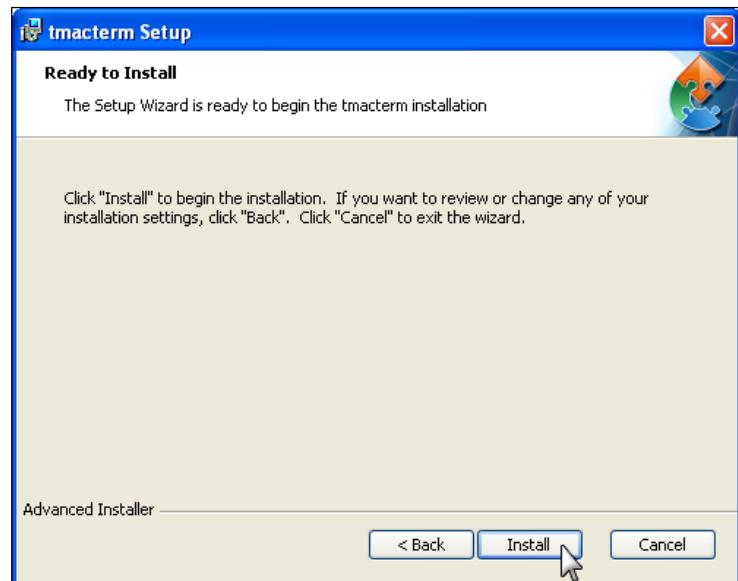


Fig. 33

6. The Device Driver Installation Wizard launches (Fig. 34). Click *Next*.



Fig. 34

7. Click *Finish* to complete the Device Driver Installation (Fig. 35).



Fig. 35

8. Click *Finish* to exit the DTMAC term Setup Wizard (Fig. 36).
9. Check that the DTMAC term software icon appears on your desktop.

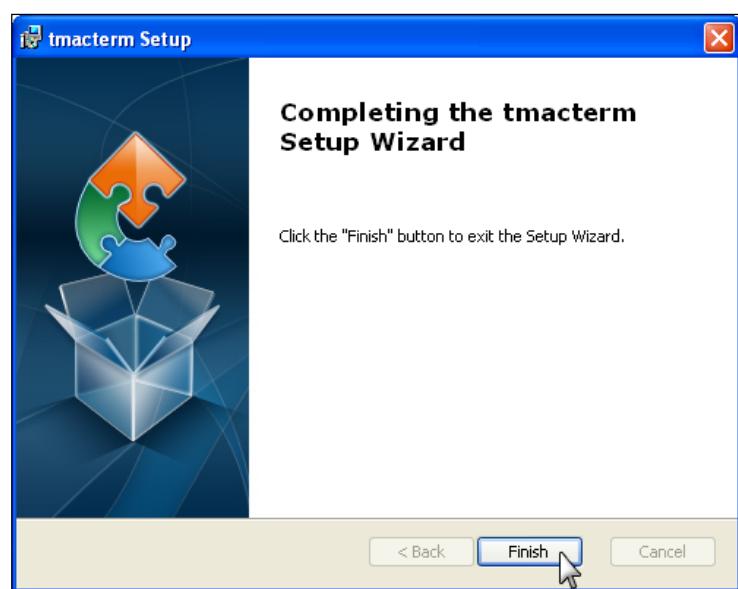


Fig. 36

# Appendix A: PANID Decimal to Binary Switch Position Conversion Tables

Refer to the tables in this appendix to determine the binary switch positions for controllers in networks with PANID Numbers 11 to 255.

PANID Number (Decimal)	Binary Switch Position
11	00001011
12	00001100
13	00001101
14	00001110
15	00001111
16	00010000
17	00010001
18	00010010
19	00010011
20	00010100
21	00010101
22	00010110
23	00010111
24	00011000
25	00011001

PANID Number (Decimal)	Binary Switch Position
26	00011010
27	00011011
28	00011100
29	00011101
30	00011110
31	00011111
32	00100000
33	00100001
34	00100010
35	00100011
36	00100100
37	00100101
38	00100110
39	00100111
40	00101000

PANID Number (Decimal)	Binary Switch Position
41	00101001
42	00101010
43	00101011
44	00101100
45	00101101
46	00101110
47	00101111
48	00110000
49	00110001
50	00110010
51	00110011
52	00110100
53	00110101
54	00110110
55	00110111

PANID Number (Decimal)	Binary Switch Position
56	00111000
57	00111001
58	00111010
59	00111011
60	00111100
61	00111101
62	00111110
63	00111111
64	01000000
65	01000001
66	01000010
67	01000011
68	01000100
69	01000101
70	01000110
71	01000111
72	01001000
73	01001001
74	01001010
75	01001011

PANID Number (Decimal)	Binary Switch Position
76	01001100
77	01001101
78	01001110
79	01001111
80	01010000
81	01010001
82	01010010
83	01010011
84	01010100
85	01010101
86	01010110
87	01010111
88	01011000
89	01011001
90	01011010
91	01011011
92	01011100
93	01011101
94	01011110
95	01011111

PANID Number (Decimal)	Binary Switch Position
96	01100000
97	01100001
98	01100010
99	01100011
100	01100100
101	01100101
102	01100110
103	01100111
104	01101000
105	01101001
106	01101010
107	01101011
108	01101100
109	01101101
110	01101110
111	01101111
112	01110000
113	01110001
114	01110010
115	01110011

PANID Number (Decimal)	Binary Switch Position
116	01110100
117	01110101
118	01110110
119	01110111
120	01111000
121	01111001
122	01111010
123	01111011
124	01111100
125	01111101
126	01111110
127	01111111
128	10000000
129	10000001
130	10000010
131	10000011
132	10000100
133	10000101
134	10000110
135	10000111

PANID Number (Decimal)	Binary Switch Position
136	10001000
137	10001001
138	10001010
139	10001011
140	10001100
141	10001101
142	10001110
143	10001111
144	10010000
145	10010001
146	10010010
147	10010011
148	10010100
149	10010101
150	10010110
151	10010111
152	10011000
153	10011001
154	10011010
155	10011011

PANID Number (Decimal)	Binary Switch Position
156	10011100
157	10011101
158	10011110
159	10011111
160	10100000
161	10100001
162	10100010
163	10100011
164	10100100
165	10100101
166	10100110
167	10100111
168	10101000
169	10101001
170	10101010
171	10101011
172	10101100
173	10101101
174	10101110
175	10101111

PANID Number (Decimal)	Binary Switch Position
176	10110000
177	10110001
178	10110010
179	10110011
180	10110100
181	10110101
182	10110110
183	10110111
184	10111000
185	10111001
186	10111010
187	10111011
188	10111100
189	10111101
190	10111110
191	10111111
192	11000000
193	11000001
194	11000010
195	11000011

PANID Number (Decimal)	Binary Switch Position
196	11000100
197	11000101
198	11000110
199	11000111
200	11001000
201	11001001
202	11001010
203	11001011
204	11001100
205	11001101
206	11001110
207	11001111
208	11010000
209	11010001
210	11010010
211	11010011
212	11010100
213	11010101
214	11010110
215	11010111

PANID Number (Decimal)	Binary Switch Position
216	11011000
217	11011001
218	11011010
219	11011011
220	11011100
221	11011101
222	11011110
223	11011111
224	11100000
225	11100001
226	11100010
227	11100011
228	11100100
229	11100101
230	11100110
231	11100111
232	11101000
233	11101001
234	11101010
235	11101011

PANID Number (Decimal)	Binary Switch Position
<b>236</b>	11101100
<b>237</b>	11101101
<b>238</b>	11101110
<b>239</b>	11101111
<b>240</b>	11110000
<b>241</b>	11110001
<b>242</b>	11110010
<b>243</b>	11110011
<b>244</b>	11110100
<b>245</b>	11110101
<b>246</b>	11110110
<b>247</b>	11110111
<b>248</b>	11111000
<b>249</b>	11111001
<b>250</b>	11111010
<b>251</b>	11111011
<b>252</b>	11111100
<b>253</b>	11111101
<b>254</b>	11111110
<b>255</b>	11111111

# Appendix B: Remote Access Procedures

## B.1 Overview of Control Interface and Capabilities

Remote access to the DTMAC controller enables better control of the entire network. By accessing the SunPower DTMAC Advanced Tracker Controller monitoring application, you can perform the following tasks:

- Stowing the array
- Checking array status
- Accessing weather data
- Accessing temperature readings for each DTMAC controller
- Carrying out advanced control functions with outside data
- Performing advanced maintenance functions
- Generating email reports

**Note.** Most of these functions are add-ons and chargeable to our customers.

## B.2 User Types

The DTMAC Monitoring Team assigns user roles to specific employees and third party representatives in order to execute DTMAC control functions, and perform equipment monitoring and system optimization.

The following user types can access the DTMAC server:

User	Description
<b>Administrator</b>	A SunPower employee assigned unrestricted access to the DTMAC server and authorized to execute the following functions for all monitored sites: <ul style="list-style-type: none"><li>• Commissioning a DTMAC controller (full remote configuration)</li><li>• Setting specific controller parameters (minimal remote configuration)</li><li>• Full remote operation</li><li>• Minimal remote operation</li><li>• Changing controller firmware</li><li>• Locating a DTMAC</li><li>• Creating and managing customer, site, network, and DTMAC information</li><li>• Accessing detailed views of all objects using admin tabs</li><li>• Creating and managing user accounts</li></ul>
<b>Supervisor</b>	A SunPower employee assigned permission to execute the following functions for a specific site or sites, or all monitored sites: <ul style="list-style-type: none"><li>• Commissioning a DTMAC controller</li><li>• Setting specific controller parameters</li></ul>

	<ul style="list-style-type: none"> <li>• Full remote operation</li> <li>• Minimal remote operation</li> <li>• Locating a DTMAC</li> <li>• Editing customer, site, network, and DTMAC information</li> <li>• Accessing detailed views of all objects using admin tabs</li> <li>• Creating and managing user accounts</li> </ul>
<b>Operator</b>	A SunPower employee assigned permission to set specific controller parameters (minimal remote configuration) and execute select operational commands (minimal remote operation) for a specific, or all, monitored sites.
<b>Viewer</b>	A SunPower employee or an authorized third party representative assigned permission to view customer or site information, or both.

**Important!** All users have the option to subscribe to daily email alerts for a monitored site or sites. To subscribe to daily email alerts, contact the SunPower Operations and Maintenance Department. Only an administrator user can enable this option for another user.

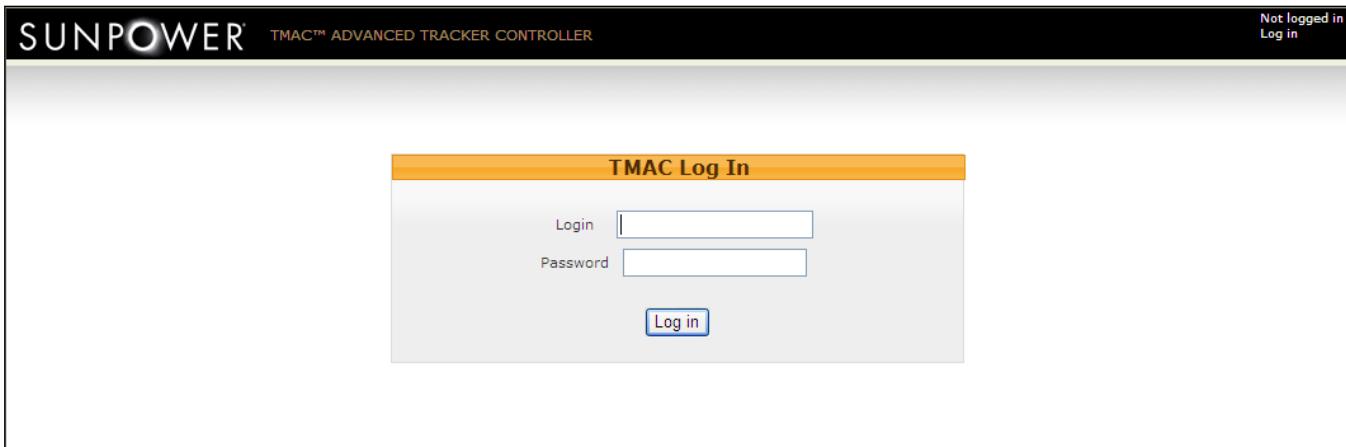
## B.3 Accessing the SunPower DTMAC Controller Monitoring Application

**Important!** To access the SunPower DTMAC Advanced Tracker Controller monitoring application, you need login credentials. Contact the SunPower Operations and Maintenance Department to have an account set up for you and assign user permissions as necessary.

### B.3.1 Logging In

To log in to the application:

1. Navigate to the SunPower DTMAC Advanced Tracker Controller monitoring website  
<http://dtmac.sunpowermonitor.com>
2. On the DTMAC Log In page, enter your username and password in the **Login** and **Password** fields, respectively and click *Log in*.



The screenshot shows the 'TMAC Log In' page. At the top, there's a header with the SunPower logo and the text 'TMAC™ ADVANCED TRACKER CONTROLLER'. In the top right corner, it says 'Not logged in' and has a 'Log in' link. The main content area is titled 'TMAC Log In' and contains two input fields: 'Login' and 'Password', each with its own text input box. Below these fields is a blue 'Log in' button.

[DTMAC Log In page](#)

**Note.** Passwords are case sensitive.

3. The application's main page opens (Fig. B1).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER main page. At the top, there is a header with the SunPower logo, the text "TMAC™ ADVANCED TRACKER CONTROLLER", and a user status bar indicating "Logged in as [username]". Below the header, there are six tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is currently selected.

The main content area is divided into several sections:

- Left Sidebar:** A list of sites with alerts, each with a triangle icon and text: HQ TZ:-08:00, Sonoma Water District TZ:-08:00, Uncategorized units TZ:-08:00, Elverta R&D TZ:-08:00, Rancho California Water District TZ:-08:00, QTP TZ:-08:00, Inland Empire RP-5 TZ:-08:00, Exelon TZ:-06:00, Montalto Centauro 9MWP TZ:+01:00, and Sandia Hammer TZ:-07:00.
- Top Center:** A section titled "UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:" showing two lists of units with alerts. The first list is for SunPower, Inc. and the second is for Montalto Centauro 9MWP TZ:+01:00.
- Bottom Left:** A box labeled "Uncategorized units" containing "Uncategorized units TZ:-08:00".
- Bottom Right:** A box labeled "SunPower, Inc. (R&D)" containing "HQ TZ:-08:00".

Fig. B1

**Important!** To administrator and supervisor users, the main page is displayed as the **DASHBOARD** tab page. Dashboard options refer to selections of contents for display on the main page. The **DASHBOARD** and six other tabs in the header of the page are collectively referred to as administrator or admin tabs.

To help you begin using the DTMAC application, the main page elements are described in the following table.

Page Element	Description
SunPower logo	Click to refresh or return to the main or <b>DASHBOARD</b> tab page.
Administrator tabs	<p>The seven tabs in the header of the page are available <i>only</i> to administrator and supervisor users.</p> <ul style="list-style-type: none"> <li>The <b>DASHBOARD</b> tab page is the main page and contains the <i>Options</i> and <i>Search</i> buttons, the site list, and the lists of DTMACs per site that have alerts. This page enables you to open the site-, network-, and DTMAC unit-level views through links on the page.</li> <li>The <b>CUSTOMERS</b> tab page is the Customer page and contains the list of customers whose tracker systems are monitored through the DTMAC application. Links on this page enable you to perform the following:</li> </ul>

	<ul style="list-style-type: none"> <li>○ Create new customer profiles</li> <li>○ View, edit, or delete customer information</li> <li>○ Open the <b>Site for [Customer name]</b> window that contains the site list for the selected customer, and links that enable you to view, edit, or delete site information</li> <li>● The <b>SITES</b> tab page is the Site page and contains the list of all monitored sites. Links on this page enable you to perform the following:           <ul style="list-style-type: none"> <li>○ Create new site profiles</li> <li>○ View, edit, or delete site information</li> <li>○ Open the <b>Update [Customer name]</b> window to set options for automatic email reporting for the customer</li> <li>○ Open the <b>Network for [Site name]</b> window to view the network list for the selected site, and to view, edit, or delete network information</li> <li>○ Open the <b>Update DTMAC:locked, Wireless:locked</b> window to enter or select DTMAC and wireless lock settings</li> <li>○ Send a command to stow the entire site</li> </ul> </li> <li>● The <b>NETWORKS</b> tab page is the Network page and contains the list of all monitored networks. Links on this page enable you to perform the following:           <ul style="list-style-type: none"> <li>○ Create new network profiles</li> <li>○ View, edit, or delete network information</li> <li>○ Open the <b>Update [Site name]</b> window to update site information</li> <li>○ Open the <b>Unit for [Network name]</b> to view the list of DTMACs in the network; view, edit, or delete DTMAC unit information; view messages and updates for a DTMAC in the network; and map or connect a DTMAC unit to a Maximo ID</li> </ul> </li> <li>● The <b>UNITS</b> tab page is the Unit page and contains the list of all monitored DTMACs. Links on this page enable you to perform the following:           <ul style="list-style-type: none"> <li>○ Create new DTMAC unit profiles</li> <li>○ View, edit, or delete DTMAC unit information</li> <li>○ View messages and updates for a DTMAC</li> <li>○ Map or connect a DTMAC unit to a Maximo ID</li> <li>○ Open the <b>Update [Network name]</b> window to update network information</li> <li>○ Open the window that contains the <b>REMOTE UPDATE FOR [DTMAC UNIT]</b> and <b>COMMISSIONING</b> forms to set or change the controller's configuration parameters</li> </ul> </li> <li>● The <b>USERS</b> tab page is the User page and contains the list of all the authorized users of the DTMAC application. Links on this page enable you to perform the following:           <ul style="list-style-type: none"> <li>○ Create new user accounts</li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>○ View, edit, or delete user information</li> <li>○ Open the <b>Role for [User name]</b> window to create a new role or roles for the selected user; and view, edit, or delete role or roles</li> <li>○ Change another user's password</li> <li>● The <b>ROLES</b> tab page is the Usertype page and contains the list of user types and functions assigned to users of the application</li> </ul>
<b>Logged in as [login name]</b>	Indicates that access is authorized for the login name displaying; click the login name to view user information in the <b>Show User</b> window
<b>Logout</b>	Link to log out of the DTMAC application
<b>Account</b>	Link to the <b>EDIT ACCOUNT SETTINGS FOR [USER NAME]</b> and <b>CHANGE PASSWORD FOR [USER NAME]</b> screens on the <b>USERS</b> tab page
<b>ALERT: [No. of] UNMAPPED UNITS</b>	<p>Link to the form for Maximo Mappings on the <b>UNITS</b> tab page</p> <p><b>Note.</b> This functionality is available to administrator and supervisor users only.</p>
<b>Options</b> button	Enables you to change view options on the main or <b>DASHBOARD</b> tab page
<b>Search</b> button	Enables you to filter the site list by a site name
Site list	<p>Lists all monitored sites.</p> <p>Click the site name to expand the pane. The expanded pane contains links to the site-, network-, and DTMAC unit-level views on the main or <b>DASHBOARD</b> tab page.</p>
<b>UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:</b>	<p>Lists sites with DTMAC units that have alerts, both occurring and persistent.</p> <p>Click the site name to open the site-level view; click the DTMAC unit name to open the unit-level view.</p>

To filter the lists on the main page such that only the sites with alerts are displayed:

1. Click *Options* in the upper left of the page.
2. Select (or check) the *Show only errors?* check box in the **Dashboard Options** window and then click *Save changes* (Fig. B2).

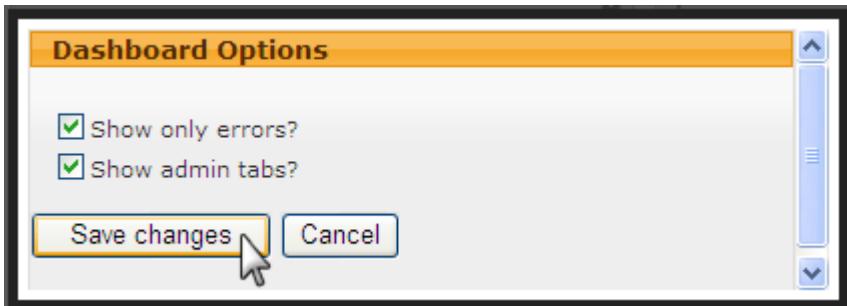


Fig. B2

3. Click *Reload Page* in the confirmation window (Fig. B3).

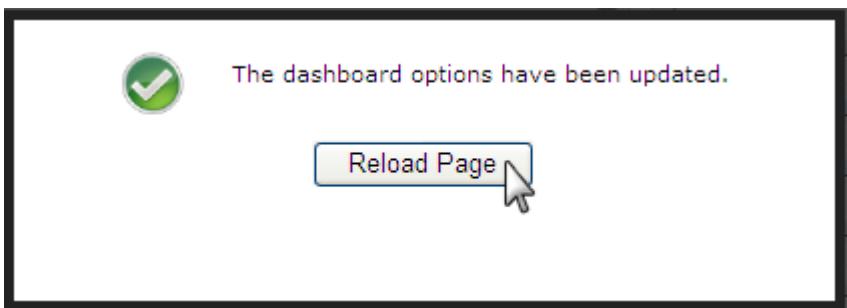


Fig. B3

4. The main page displays the filtered lists showing the sites with alerts during the last 24 hours (Fig. B4).  
Sites that have DTMAC units with persistent alerts (more than 24 hours) are also included in the list.

The screenshot shows the TMAC™ Advanced Tracker Controller interface. At the top, there's a navigation bar with tabs for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. A user is logged in as 'John Doe'. There are 46 unmapped units. On the left, a sidebar titled 'Options' lists various site names with their respective alert status (e.g., HQ TZ:-08:00, Uncategorized units TZ:-08:00, Elverta R&D TZ:-08:00, etc.). The main content area has a header 'UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:' and displays two tables. The first table shows 'SunPower, Inc.' and 'Rancho California Water District TZ:-08:00' with their respective alert details. The second table shows 'Inland Empire RP-5 TZ:-08:00' with a long list of alerts. At the bottom, there are two buttons: 'SunPower, Inc.' and 'Uncategorized units'.

**Fig. B4**

To view the full list of all monitored sites, click **Options** and then clear (unchecked) the **Show only errors?** in the **Dashboard Options** window before saving the changes and reloading the page.

**Important!** The site list includes a grouping of new controllers that have yet to be assigned to a site or network, or both. New controllers are grouped under **Uncategorized units TZ:-08:00**. To assign a new controller to a site or network (or both), refer to Section B.3.17.

**Note.** The **Uncategorized units TZ:-08:00** shows up in the site list for administrator and supervisor users only.

## B.3.2 Viewing Site Information

You can view site information through links that display the site-level view on the main or **DASHBOARD** tab page, and in the **Show Site** window that you can open through links on the Customer and Site pages.

### B.3.2.1 Using the Main or Dashboard Tab Page

To view site information on the main or **DASHBOARD** tab page:

1. Click the name of the site in the site list (Fig. B5).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there's a navigation bar with tabs for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is selected. On the left, a sidebar lists sites under 'Site' and networks under 'Network'. A mouse cursor is hovering over the 'Sonoma Water District TZ:-08:00' link. In the center, there's a large table titled 'UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:' containing two sections: 'SunPower, Inc.' and 'Montalto Centauro 9MWP TZ:+01:00'. Each section lists various units with their specific error codes and details.

UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:	
SunPower, Inc.	
Rancho California Water District TZ:-08:00	
⚠ 00:13:a2:00:40:66:0e:68 (M0531_AREA01_TRK04 PN:1/0)	✖
⚠ 00:13:a2:00:40:66:0d:6f (M0531_AREA01_TRK05 PN:1/9)	✖
Montalto Centauro 9MWP TZ:+01:00	
⚠ Tracker 6 (PN:1/0)	✖
⚠ Tracker 4 (PN:1/4)	✖
⚠ Tracker 3 (PN:1/3)	✖
⚠ Tracker 67 (PN:1/9)	✖
⚠ Tracker 9 (PN:1/6)	✖
⚠ Tracker 1 (PN:1/1)	✖
⚠ Tracker 2 (PN:1/2)	✖
⚠ Tracker 11 (PN:1/8)	✖
⚠ Tracker 8 (PN:1/7)	✖
⚠ Tracker 68 (Coordinator) (PN:2/0)	✖
⚠ Tracker 16 (PN:2/6)	✖
⚠ Tracker 13 (PN:2/4)	✖
⚠ Tracker 69 (PN:2/10)	✖
⚠ Tracker 66 (PN:2/8)	✖
⚠ Tracker 10 (PN:2/2)	✖
⚠ Tracker 7 (PN:2/1)	✖
⚠ Tracker 12 (PN:2/3)	✖
⚠ Tracker 14 (PN:2/5)	✖
⚠ Tracker 19 (PN:2/7)	✖
⚠ Tracker 20 (PN:3/0)	✖
⚠ Tracker 15 (PN:3/10)	✖
⚠ Tracker 17 (PN:3/1)	✖
⚠ Tracker 18 (PN:3/2)	✖

Fig. B5

If the site you want to view has an alert, locate the site name in the **UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:** section and click the site name link to open the site-level view (Fig. B6).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as **isay**  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

**DASHBOARD** CUSTOMERS SITES NETWORKS UNITS USERS ROLES

Options Search

**UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:**

- **HQ TZ:-08:00**
- **Sonoma Water District TZ:-08:00**
- **Uncategorized units TZ:-08:00**
- **Elverta R&D TZ:-08:00**
- **Rancho California Water District TZ:-08:00**
- **QTP TZ:-08:00**
- **Inland Empire RP-5 TZ:-08:00**

**Rancho California Water District TZ:-08:00**

**SunPower, Inc.**

**Rancho California Water District TZ:-08:00**

⚠ 00:13:a2:00:40:66:0e:68  
(M0531\_AREA01\_TRK04 PN:1/0)

⚠ 00:13:a2:00:40:66:0d:6f  
(M0531\_AREA01\_TRK05 PN:1/9)

⚠ 00:13:a2:00:40:66:0d:c5  
(M0531\_AREA01\_TRK13 PN:1/1)

**SunPower, Inc.**

**Montalto Centauro 9MWP TZ:+01:00**

⚠ Tracker 6 (PN:1/0)  
⚠ Tracker 4 (PN:1/4)  
⚠ Tracker 3 (PN:1/3)  
⚠ Tracker 67 (PN:1/9)  
⚠ Tracker 9 (PN:1/6)  
⚠ Tracker 1 (PN:1/1)  
⚠ Tracker 2 (PN:1/2)  
⚠ Tracker 11 (PN:1/8)  
⚠ Tracker 8 (PN:1/7)  
⚠ Tracker 68 (Coordinator) (PN:2/0)

Fig. B6

2. In the expanded pane for the selected site, click the site name link to display the site-level view. The site information is at the topmost section of the page (Fig. B7).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as **isay**  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

**DASHBOARD** CUSTOMERS SITES NETWORKS UNITS USERS ROLES

Options Search

**Sonoma Water District TZ:-08:00**

**Site: Sonoma Water District TZ:-08:00**

**Network: Sonoma Network 1 (P:1)**

0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)  
(Reported 12 minutes ago)

00:13:a2:00:40:5e:09:b5  
(M0338\_AREA01\_TRK01 PN:1/1)  
(Reported 5 minutes ago)

00:13:a2:00:40:5e:09:b1  
(M0338\_AREA01\_TRK02 PN:1/2)  
(Reported 5 minutes ago)

00:13:a2:00:40:5e:09:ab  
(M0338\_AREA01\_TRK03 PN:1/3)  
(Reported 5 minutes ago)

00:13:a2:00:40:5e:09:b2  
(M0338\_AREA01\_TRK04 PN:1/4)  
(Reported 2 minutes ago)

00:13:a2:00:40:5e:09:ad  
(M0338\_AREA01\_TRK06 PN:1/6)  
(Reported 2 minutes ago)

**Uncategorized units TZ:-08:00**

**Elverta R&D TZ:-08:00**

**Site: Sonoma Water District TZ:-08:00**

**Local time:** 9:51:18 PM  
**Customer:** SunPower, Inc.  
**Time Zone:** Pacific Time (US & Canada)  
**NWS Stow:** On  
**Stow Status:** normal

**Stow configuration:** Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.  
**Unstow configuration:** Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.

POWERED BY Google Imperial Dr Map data ©2011 Google - Terms of Use

Click marker to open map in a new tab.

Currently viewing: 2011-01-10 to 2011-01-11 Graph does not show current data.

GRAPHS

Graph type: Motor history

MOTOR POSITION AND SETPOINT

Fig. B7

To view the site location map in a separate window, click the marker on the map.

3. View the site information.

Information	Description
<b>Local time</b>	Real-time, 12-hour format local time with AM/PM
<b>Customer</b>	Name of the customer
<b>Time Zone</b>	The time zone in text
<b>NWS Stow</b>	The National Weather Service Stow Enable indicator— <i>ON</i> indicates NWS is enabled; <i>OFF</i> , disabled. Stow and unstow parameters are defined in the Stow and Unstow Configuration retrospect.
<b>Stow Status</b>	Current system status
<b>Stow Configuration</b>	Defines the parameters at which the controller will stow the panels
<b>Unstow configuration</b>	Defines the parameters at which the controller will allow the panels to resume normal operations

4. Use the sections in the site-level view to perform remote monitoring and control functions:

Section	Description
<b>GRAPHS</b>	Enables you to plot site-level data, both current and historical; for more information about graph types and procedure, refer to Section B.3.5.
<b>REMOTE UPDATES</b>	Enables you to send commands to the controller to either stow or move the tracker to the nighttime position, and to set the nighttime angle for all units at the site  Refer to Section B.3.10.
<b>COMPARE UNIT CONFIGURATIONS</b>	Enables you to view parameter settings for each DTMAC at the site and compare parameters between controllers

### B.3.2.2 Using the Sites Tab Page

To view site information on the **SITES** tab page:

1. Click the **SITES** tab to open the Site page (Fig. B8).



The screenshot shows the TMAC™ Advanced Tracker Controller interface. At the top, there's a header with the SunPower logo and navigation links: DASHBOARD, CUSTOMERS, SITES (which is highlighted with a red arrow), NETWORKS, UNITS, USERS, and ROLES. To the right of the header, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the header is a search bar with "Search" and "Create New" buttons. The main area is titled "Site" and contains a table with columns: Name, Address, Customer, Networks, Latitude, Longitude, Stow status, Stow configuration, Unstow configuration, Site setting, and Time zone. There are six rows of data in the table, each representing a different site with its details.

Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone
HQ	Create New	SunPower, Inc. (R&D)	Back 40 trackers (P:1), R&D lab (P:0), R&D Lab 3 (P:3), ... (4)	37.9125	-122.3579	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:locked	Pacific Time (US & Canada)
Sonoma Water District	Sonoma CA USA	SunPower, Inc.	Sonoma Network 1 (P:1)	38.25284	-122.44142	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:unlocked	Pacific Time (US & Canada)
Uncategorized units		Uncategorized units	Uncategorized units (P:5)	37.9124	-122.3579	Unstowed	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)
Elverta R&D		SunPower, Inc. (R&D)	Hammer network (P:1)	38.7289	-121.47983	Stow site	Stowing is disabled.	Unstowing is disabled.	Create New	Pacific Time (US & Canada)
Rancho California Water District		SunPower, Inc.	Rancho Network 1 (P:1), Rancho Network 2 (P:2)	33.54	-117.19	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)
QTP		SunPower, Inc. (R&D)	QTP Network 1 (P:1), QTP Network 2 (P:2)	37.382	-122.0082	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots,	Create New	Pacific Time (US & Canada)

Fig. B8

2. Look for the site name under the **Name** column. Use the scroll bar and page selector at the bottom of the page as necessary. Alternately, you can filter the list by using the search function. Click **Search** and enter any part of the site name (for example, *Rancho*) in the **Search Terms** field and then click **Search** (Fig. B9).

Site											
Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone	
HQ	Create New	SunPower, Inc. (R&D)	Back 40 trackers (P:1), R&D lab (P:0), R&D Lab 3 (P:3), ... (4)	37.9125	-122.3579	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:locked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Sonoma Water District	Sonoma CA USA	SunPower, Inc.	Sonoma Network 1 (P:1)	38.25284	-122.44142	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:unlocked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

Fig. B9

3. The page displays the filtered list based on the search entry (Fig. B10). Click **Show** under the last (untitled) column to display the site information.

Site											
Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone	
(Filtered)											
Rancho California Water District		SunPower, Inc.	Rancho Network 1 (P:1), Rancho Network 2 (P:2)	33.54	-117.19	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

Fig. B10

4. View the site information in the **Show Site** window (Fig. B11).

Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone
(Filtered)										

**Show Site**

Address	tmac_admin@sunpowercorp.com
Admin	tmac_admin@sunpowercorp.com
Created at	Thu, 17 Dec 2009 01:03:50 +0000
Customer	SunPower, Inc.
Elevation meters	0.0
Enable email reporting?	false
Forecasts	#<Forecast:0xb6cb6928>, #<Forecast:0xb6cb68c4>, #<Forecast:0xb6cb6874>, ... (6541)
Latitude	33.54
Longitude	-117.19
Name	Rancho California Water District
Networks	Rancho Network 1 (P:1), Rancho Network 2 (P:2)
Nws stow state	0
Site setting	-
Hours of high wind forecast to monitor	24.0
Stow clear time	Sun, 20 Sep 2009 20:28:49 +0000
Gust forecast for stowing (knots)	80.0
Enable stow on NWS forecast?	true
Sustained wind forecast for stowing (knots)	60.0
Time zone	Pacific Time (US & Canada)
Units	00:13:a2:00:40:66:0e:68 (M0531_AREA01_TRK04 PN:1/0), 00:13:a2:00:40:66:0d:6f (M0531_AREA01_TRK05 PN:1/9), 00:13:a2:00:40:66:0d:7e (M0531_AREA01_TRK06 PN:1/8), ... (13)
Enable automatic unstow after wind abates?	false
Gust forecast that prevents unstow (knots)	60.0
Hours to remain stowed after wind forecast abates	6.0
Sustained wind forecast that prevents unstow (knots)	40.0
Updated at	Wed, 26 Jan 2011 07:01:10 +0000
Wind over stow	-
Wind over unstow	-

**Close**

Fig. B11

Click **Close** or the X button to close the **Show Site** window. Click **Reset** to display the complete site list.

### B.3.2.3 Using the Customers Tab Page

To view site information on the **CUSTOMERS** tab page:

1. Click the **CUSTOMERS** tab to open the Customer page (Fig. B12).

Customer				<a href="#">Search</a> <a href="#">Create New</a>	
Name	Updated at	Sites			
SunPower, Inc.	Sat, 29 Aug 2009 00:00:11 +0000	Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, Inland Empire RP-5 TZ:-08:00, ... (6)	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
Uncategorized units	Wed, 28 Oct 2009 20:03:14 +0000	Uncategorized units TZ:-08:00	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
SunPower, Inc. (R&D)	Tue, 15 Dec 2009 04:19:31 +0000	HQ TZ:-08:00, Elvera R&D TZ:-08:00, QTP TZ:-08:00, ... (4)	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
SunPower, Inc. (Don test)	Tue, 13 Jul 2010 22:03:45 +0000	Mountville TZ:-05:00, Northside TZ:-08:00	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
4 Found			<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>

Fig. B12

2. Look for the customer name under the **Name** column. If it is a big list, use the search function to filter the list.
3. To open the **Site for [Customer name]** window, click the site link under the **Sites** column for the customer row (Fig. B13).

Customer				<a href="#">Search</a> <a href="#">Create New</a>	
Name	Updated at	Sites			
SunPower, Inc.	Sat, 29 Aug 2009 00:00:11 +0000	Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, Inland Empire RP-5 TZ:-08:00, ... (6)	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
Uncategorized units	Wed, 28 Oct 2009 20:03:14 +0000	Uncategorized units TZ:-08:00	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
SunPower, Inc. (R&D)	Tue, 15 Dec 2009 04:19:31 +0000	HQ TZ:-08:00, Elvera R&D TZ:-08:00, QTP TZ:-08:00, ... (4)	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
SunPower, Inc. (Don test)	Tue, 13 Jul 2010 22:03:45 +0000	Mountville TZ:-05:00, Northside TZ:-08:00	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>
4 Found			<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Show</a>

Fig. B13

4. In the **Site for [Customer name]** window, look for the site name under the **Name** column or click **Search** (at the top right corner of the window) to filter the list by the site name. Click **Show** under the last (untitled) column to display the site information (Fig. B14).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as [User](#)  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

DASHBOARD CUSTOMERS SITES NETWORKS UNITS USERS ROLES

**Customer**

Name	Updated at	Sites																																																																																							
SunPower, Inc.	Sat, 29 Aug 2009 00:00:11 +0000	Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, Inland Empire RP-5 TZ:-08:00, ... (6)																																																																																							
<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>																																																																																									
<b>Site for SunPower, Inc.</b> <table border="1"> <thead> <tr> <th>Name</th> <th>Address</th> <th>Networks</th> <th>Latitude</th> <th>Longitude</th> <th>Stow status</th> <th>Stow configuration</th> <th>Unstow configuration</th> <th>Site setting</th> <th>Time zone</th> <th colspan="2"></th> </tr> </thead> <tbody> <tr> <td>Sonoma Water District</td> <td>Sonoma CA USA</td> <td>Sonoma Network 1 (P:1)</td> <td>38.25284</td> <td>-122.44142</td> <td>Stow site</td> <td>Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.</td> <td>Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.</td> <td>TMAC:locked, Wireless:unlocked</td> <td>Pacific Time (US &amp; Canada)</td> <td><a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a></td> </tr> <tr> <td>Rancho California Water District</td> <td></td> <td>Rancho Network 1 (P:1), Rancho Network 2 (P:2)</td> <td>33.54</td> <td>-117.19</td> <td>Stow site</td> <td>Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.</td> <td>Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.</td> <td>Create New</td> <td>Pacific Time (US &amp; Canada)</td> <td><a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a></td> </tr> <tr> <td>Inland Empire RP-5</td> <td></td> <td>RP-5 Network 1 (P:1)</td> <td>33.96</td> <td>-117.67</td> <td>Stow site</td> <td>Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.</td> <td>Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.</td> <td>Create New</td> <td>Pacific Time (US &amp; Canada)</td> <td><a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a></td> </tr> <tr> <td>Exelon</td> <td></td> <td>Exelon Network 3 (P:3), Exelon Network 1 (P:1), Exelon Network 2 (P:2), ... (5)</td> <td>41.68</td> <td>-87.65</td> <td>Stow site</td> <td>Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.</td> <td>Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.</td> <td>Create New</td> <td>Central Time (US &amp; Canada)</td> <td><a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a></td> </tr> <tr> <td>Montalto Centauro 9MWP</td> <td></td> <td>M9_Network_1 (P:1), M9_Network_2 (P:2), M9_Network_3 (P:3)</td> <td>42.37679</td> <td>11.59831</td> <td>Stow site</td> <td>Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.</td> <td>Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.</td> <td>Create New</td> <td>Rome</td> <td><a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a></td> </tr> <tr> <td>Site Name</td> <td></td> <td>Network Name (P:-1)</td> <td>37.8805</td> <td>-122.264</td> <td></td> <td>Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.</td> <td>Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.</td> <td>Create New</td> <td>Pacific Time (US &amp; Canada)</td> <td><a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a></td> </tr> </tbody> </table>												Name	Address	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone			Sonoma Water District	Sonoma CA USA	Sonoma Network 1 (P:1)	38.25284	-122.44142	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:unlocked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>	Rancho California Water District		Rancho Network 1 (P:1), Rancho Network 2 (P:2)	33.54	-117.19	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>	Inland Empire RP-5		RP-5 Network 1 (P:1)	33.96	-117.67	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>	Exelon		Exelon Network 3 (P:3), Exelon Network 1 (P:1), Exelon Network 2 (P:2), ... (5)	41.68	-87.65	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Central Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>	Montalto Centauro 9MWP		M9_Network_1 (P:1), M9_Network_2 (P:2), M9_Network_3 (P:3)	42.37679	11.59831	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Rome	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>	Site Name		Network Name (P:-1)	37.8805	-122.264		Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
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6 Found																																																																																									

Fig. B14

5. View the site information in the **Show Site** window (Fig. B15).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there's a header with the SunPOWER logo, the text "TMAC™ ADVANCED TRACKER CONTROLLER", and a user status bar indicating "Logged in as [username]". Below the header, a navigation menu includes tabs for DASHBOARD, CUSTOMERS (which is selected), SITES, NETWORKS, UNITS, USERS, and ROLES. A message "ALERT: 46 UNMAPPED UNITS" is displayed.

The main area shows a table for "Customer" with one row for "SunPower, Inc.". The table columns include Name, Updated at, and Sites. The "Sites" column contains the text "Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, Inland Empire RP-5 TZ:-08:00, ... (6)". To the right of this table are buttons for Edit, Delete, and Show.

A modal window titled "Site for SunPower, Inc." is open, showing detailed site configuration settings. The modal has a "Show Site" button at the top left and a close button at the top right. The settings listed include:

Name	Address	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone
Address	Sonoma CA USA								
Admin	skraft@sunpowercorp.com								
Created at	Tue, 29 Sep 2009 17:34:28 +0000								
Elevation meters	9.0								
Enable email reporting?	true								
Forecasts	#<Forecast:0xb69d76d0>, #<Forecast:0xb69d766c>, #<Forecast:0xb69d761c>, ... (9155)								
Latitude	38.25284								
Longitude	-122.44142								
Name	Sonoma Water District								
Networks	Sonoma Network 1 (P:1)								
Nws stow state	0								
Site setting	TMAC:locked, Wireless:un-locked								
Hours of high wind forecast to monitor	24.0								
Stow clear time	Sun, 20 Sep 2009 20:28:00 +0000								
Gust forecast for stowing (knots)	80.0								
Enable stow on NWS forecast?	true								
Sustained wind forecast for stowing (knots)	60.0								
Time zone	Pacific Time (US & Canada)								
Units	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)								
Enable automatic unstow after wind abates?	false								
Gust forecast that prevents unstow (knots)	60.0								
Hours to remain stowed after wind forecast abates	6.0								
Sustained wind forecast that prevents unstow (knots)	40.0								
Updated at	Fri, 28 Jan 2011 04:01:57 +0000								
Wind over stow	-								
Wind over unstow	-								

At the bottom left of the modal is a "Close" button.

Fig. B15

6. Click **Close** or the X button to close the **Show Site** window. Click the **CUSTOMERS** tab to refresh the page.

## B.3.3 Viewing Network Information

You can view network information through links that display the network-level view on the main or **DASHBOARD** tab page, and in the **Show Network** window that you can open through links on the Customer, Site, and Network pages.

### B.3.3.1 Using the Main or Dashboard Tab Page

To view network information on the main or **DASHBOARD** tab page:

1. Click the site name in the site list.
2. In the expanded pane for the selected site, click the network name link to display the network-level view. The network information is at the topmost section of the page (Fig. B16).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is selected. On the left, a sidebar lists sites under 'Sonoma Water District TZ:-08:00'. One item, 'Network: Sonoma Network 1 (P:1)' (with a small orange arrow icon), is highlighted with a yellow background. Below this, a detailed view of the network is shown in a red-bordered box. It includes:

- Local time: 10:17:54 PM
- Customer: SunPower, Inc.
- Site: Sonoma Water District TZ:-08:00
- Time Zone: Pacific Time (US & Canada)
- PAN ID: 1
- NWS Stow: On
- Stow Status: normal

Below these details is a map showing a yellow line labeled '8th STE' with a red marker. A Google logo indicates it's powered by Google. A note says 'Click marker to open map in a new tab.' At the bottom of the red box, it says 'Currently viewing: 2011-01-10 to 2011-01-11 Graph does not show current data.'

At the very bottom of the interface, there's a timeline from 2010-12-19 to 2011-01-08, a 'GRAPHS' section with a dropdown menu set to 'Motor history', and a 'MOTOR POSITION AND SETPOINT' section with various controls.

Fig. B16

To view the site location map in a separate window, click the marker on the map.

3. View the network information.

Information	Description
<b>Local time</b>	Real-time, 12-hour format local time with AM/PM
<b>Customer</b>	Name of the customer
<b>Site</b>	The site name  <b>Note.</b> The site name is an active link. Click to view the site information (refer to Section B.3.2).
<b>Time Zone</b>	The time zone in text
<b>PAN ID</b>	The tracker group address used by the network communication
<b>NWS Stow</b>	The National Weather Service Stow Enable indicator— <i>ON</i> indicates NWS is enabled; <i>OFF</i> , disabled.  Stow and unstow parameters are defined in the Stow and Unstow configuration retrospect.
<b>Stow Status</b>	Current system status
<b>Stow Configuration</b>	Defines the parameters at which the controller will stow the panels
<b>Unstow configuration</b>	Defines the parameters at which the controller will allow the panels to resume normal operations

4. Use the sections in the network-level view to perform monitoring functions:

Section	Description
<b>GRAPHS</b>	Enables you to plot network-level data, both current and historical; for more information, refer to Section B.3.5.
<b>COMPARE UNIT CONFIGURATIONS</b>	Enables you to view parameter settings for each DTMAC at the site and compare parameters between controllers

### B.3.3.2 Using the Networks Tab Page

To view network information on the NETWORKS tab page:

1. Click the NETWORKS tab to open the Network page (Fig. B17).

**TMAC™ ADVANCED TRACKER CONTROLLER**

Logged in as [Logout](#) | [Account](#)  
ALERT: 46 UNMAPPED UNITS

**SUNPOWER**

**DASHBOARD CUSTOMERS SITES NETWORKS UNITS USERS ROLES**

**Network**

**Search** **Create New**

Site	Name	Pan	Units	Coordinator info	
HQ TZ:-08:00	Back 40 trackers	1	1: South (PN:1?/1), Hammer prototype (PN:1?/7)	166.131.61.17:2934 as root/sunpower1	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Sonoma Water District TZ:-08:00	Sonoma Network 1	1	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Uncategorized units TZ:-08:00	Uncategorized units	5	00:13:a2:00:40:3a:4c:3f (PN:2/0)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
HQ TZ:-08:00	R&D lab	0	00:13:a2:00:40:5e:09:af (PN:0/2), 00:13:a2:00:40:3a:43:52 (PN:0/0)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Elverta R&D TZ:-08:00	Hammer network	1	East (Coordinator) (PN:1/0), West (PN:1/1), Oasis T0 (PN:1/3)	166.131.61.37:2954 as admin/password	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Rancho California Water District TZ:-08:00	Rancho Network 1	1	00:13:a2:00:40:66:0e:68 (M0531_AREA01_TRK04 PN:1/0), 00:13:a2:00:40:66:0d:6f (M0531_AREA01_TRK05 PN:1/9), 00:13:a2:00:40:66:0d:7e (M0531_AREA01_TRK06 PN:1/8), ... (10)	166.131.61.124:2954 as root/sunpower1	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Rancho California Water District TZ:-08:00	Rancho Network 2	2	00:13:a2:00:40:66:0e:6f (M0531_AREA01_TRK01 PN:2/0), 00:13:a2:00:40:66:0d:d4 (M0531_AREA01_TRK02 PN:2/2), 00:13:a2:00:40:66:0e:70 (M0531_AREA01_TRK03 PN:2/1)	166.131.61.124:2955 as root/sunpower1	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
QTP TZ:-08:00	QTP Network 1	1	1.0 (PN:1/0), 1.1 (PN:1/1), 1.5 (PN:1/5), ... (6)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Inland Empire RP-5 TZ:-08:00	RP-5 Network 1	1	00:13:a2:00:40:66:0d:af (M0614_AREA01_TRK15 PN:1/1), 00:13:a2:00:40:66:0d:b7 (M0614_AREA01_TRK14 PN:1/2), 00:13:a2:00:40:66:0e:64 (M0614_AREA01_TRK13 PN:1/3), ... (15)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
QTP TZ:-08:00	QTP Network 2	2	2.0 (PN:2/0), 2.1 (PN:2/1), 2.3 (PN:2/3), ... (6)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Exelon TZ:-06:00	Exelon Network 3	3	Tracker 4.2 (M0726_A1_TRK4-2 PN:3/0), Tracker 4.1 (M0726_A1_TRK4-1 PN:3/1), Tracker 5.3 (M0726_A1_TRK5-3 PN:3/5), ... (8)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
HQ TZ:-08:00	R&D Lab 3	3	My tracker (PN:3?/7), 00:13:a2:00:40:3a:4c:41 (PN:3?/0)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Exelon TZ:-06:00	Exelon Network 1	1	Tracker 1.2 (M0726_A1_TRK1-2 PN:1/0), Tracker 1.1 (M0726_A1_TRK1-1 PN:1/1), Tracker 1.4 (M0726_A1_TRK1-4 PN:1/3), ... (4)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Exelon TZ:-06:00	Exelon Network 2	2	Tracker 2.2 (M0726_A1_TRK2-2 PN:2/0), Tracker 2.3 (M0726_A1_TRK2-3 PN:2/4), Tracker 2.1 (M0726_A1_TRK2-1 PN:2/1), ... (8)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Exelon TZ:-06:00	Exelon Network 4	4	Tracker 6.2 (M0726_A1_TRK6-2 PN:4/0), Tracker 6.3 (M0726_A1_TRK6-3 PN:4/4), Tracker 6.4 (M0726_A1_TRK6-4 PN:4/6), ... (8)		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

24 Found 1 2 | Next

Fig. B17

2. Look for the site and network names under the **Site** and **Name** columns, respectively. Use the scroll bar and page selector at the bottom of the page as necessary. Alternately, you can filter the list by using the search function. Click **Search** and enter any part of the site or network name (for example, Sonoma) in the **Search Terms** field and then click **Search** (Fig. B18).

Network					Coordinator info
Site	Name	Pan	Units		
HQ TZ:-08:00	Back 40 trackers	1	1: South (PN:1?/1), Hammer prototype (PN:1?/7)	166.131.61.17:2934 as root/sunpower1	Edit Delete Show
Sonoma Water District TZ:-08:00	Sonoma Network 1	1	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)		Edit Delete Show
Uncategorized units TZ:-08:00	Uncategorized units	5	00:13:a2:00:40:3a:4c:3f (PN:2!/0)		Edit Delete Show

Fig. B18

3. The page displays the filtered list based on the search entry (Fig. B19). The searched network or all networks in the searched site are listed on the page. Click **Show** under the last (untitled) column to display the network information for the network you want to view.

Network					Coordinator info
Site	Name	Pan	Units		
(Filtered)					
Sonoma Water District TZ:-08:00	Sonoma Network 1	1	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)		Edit Delete Show
HQ TZ:-08:00	Sonoma old	-1	-		Edit Delete Show

2 Found

Fig. B19

4. View the network information in the **Show Network** window (Fig. B20).

The screenshot shows the TMAC™ Advanced Tracker Controller interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS (which is highlighted in yellow), UNITS, USERS, and ROLES. On the right side of the header, it says "Logged in as [redacted]" and "Log out | Account". Below the header, there's an alert message: "ALERT: 46 UNMAPPED UNITS".

The main area is titled "Network" and has a search bar with the text "sonoma". Below the search bar are two buttons: "Search" and "Reset". A "Create New" button is also visible.

A table follows, with columns: Site, Name, Pan, Units, and Coordinator info. The table shows one entry: "Site: Sonoma Water District TZ:-08:00, Name: Sonoma Network 1, Pan: 1, Units: 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338\_AREA01\_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338\_AREA01\_TRK04 PN:1/4), ... (6)".

Below the table, there's a section titled "Show Network" which contains detailed network configuration settings:

- Site: Sonoma Water District TZ:-08:00
- Name: Sonoma Network 1
- Pan: 1
- Units: 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338\_AREA01\_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338\_AREA01\_TRK04 PN:1/4), ... (6)
- Coordinator Host: -
- Coordinator Port: -
- Coordinator Login: -
- Coordinator Password: -

At the bottom of the "Show Network" section, there are "Edit", "Delete", and "Show" buttons. The status bar at the bottom left says "2 Found".

**Fig. B20**

5. Click **Close** or the X button to close the **Show Network** window. Click **Reset** to display the complete network list.

### B.3.3.3 Using the Customers Tab Page

To view network information on the **CUSTOMERS** tab page:

1. Click the **CUSTOMERS** tab to open the Customer page.
2. Look for the customer name under the **Name** column and then click the site link for the customer under the **Sites** column. The **Site for [Customer name]** window opens (Fig. B21).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. The top navigation bar includes 'SUNPOWER', 'DASHBOARD', 'CUSTOMERS' (which is highlighted in yellow), 'SITES', 'NETWORKS', 'UNITS', 'USERS', and 'ROLES'. On the right side, there are links for 'Logged in as [username]', 'Log out', 'Account', and 'ALERT: 46 UNMAPPED UNITS'. The main content area is titled 'Customer' and displays a table of customers. The first row shows 'SunPower, Inc.' with an update timestamp of 'Sat, 29 Aug 2009 00:00:11 +0000'. To the right of this row are 'Edit', 'Delete', and 'Show' buttons. Below this row, a sub-table titled 'Site for SunPower, Inc.' is shown, listing various sites associated with the customer. The columns include Name, Address, Networks, Latitude, Longitude, Stow status, Stow configuration, Unstow configuration, Site setting, and Time zone. Each site entry has its own 'Edit', 'Delete', and 'Show' buttons. At the bottom left of the sub-table, it says '6 Found'.

Customer									
Name	Updated at	Sites							
SunPower, Inc.	Sat, 29 Aug 2009 00:00:11 +0000	Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, Inland Empire RP-5 TZ:-08:00, (6)							
		<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a> <b>Site for SunPower, Inc.</b>							
Name	Address	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone
Sonoma Water District	Sonoma CA USA	Sonoma Network 1 (P:1)	38.25284	-122.44142	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:unlocked	Pacific Time (US & Canada)
Rancho California Water District		Rancho Network 1 (P:1), Rancho Network 2 (P:2)	33.54	-117.19	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)
Inland Empire RP-5		RP-5 Network 1 (P:1)	33.96	-117.67	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)
Exelon		Exelon Network 3 (P:3), Exelon Network 1 (P:1), Exelon Network 2 (P:2), ... (5)	41.68	-87.65	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Central Time (US & Canada)
Montalto Centauro 9MWP		M9_Network_1 (P:1), M9_Network_2 (P:2), M9_Network_3 (P:3)	42.37679	11.59831	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Rome
Site Name		Network Name (P:-1)	37.8805	-122.264		Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	Create New	Pacific Time (US & Canada)

6 Found

Fig. B21

3. Locate the site under the **Name** column and then click the network link for the site under the **Networks** column. The **Network for [Site name]** window appears (Fig. B22).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, it says "SUNPOWER" and "TMAC™ ADVANCED TRACKER CONTROLLER". The navigation bar includes links for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. On the right, there are account details: "Logged in as [username]", "Log out | Account", and "ALERT: 46 UNMAPPED UNITS".

The main area is titled "Customer" and shows a table for "SunPower, Inc." with columns for Name, Updated at, and Sites. The "Sites" row contains Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, and Inland Empire RP-5 TZ:-08:00, ... (6). Below this is a "Site for SunPower, Inc." table with columns for Name, Address, Networks, Latitude, Longitude, Stow status, Stow configuration, Unstow configuration, Site setting, and Time zone. One entry is shown: Sonoma Water District, Sonoma CA USA, Sonoma Network 1 (P:1), 38.25284, -122.44142, Stow site, Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs., Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots, TMAC:locked, Wireless:unlocked, Pacific Time (US & Canada). Buttons for Edit, Delete, and Show are available.

A modal window titled "Network for Sonoma Water District TZ:-08:00" is open, showing a table for Sonoma Network 1 with columns Name, Pan, and Units. It lists one entry: Sonoma Network 1, 1, 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338\_AREA01\_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338\_AREA01\_TRK04 PN:1/4), ... (6). Buttons for Edit, Delete, and Show are also present. The modal has a "Coordinator info" section.

Fig. B22

4. Locate the network under the **Name** column and then click **Show** under the rightmost column. The **Show Network** window appears (Fig. B23).

This screenshot is identical to Fig. B22, showing the TMAC™ ADVANCED TRACKER CONTROLLER interface for SunPower, Inc. The "Networks" column for the selected site "Sonoma Network 1 (P:1)" is highlighted. A modal window titled "Show Network" is open, displaying the following details:

- Name:** Sonoma Network 1
- Pan:** 1
- Units:** 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338\_AREA01\_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338\_AREA01\_TRK04 PN:1/4), ... (6)
- Coordinator Host:** -
- Coordinator Port:** -
- Coordinator Login:** -
- Coordinator Password:** -

Buttons for "Close" and "1 Found" are at the bottom of the modal.

Fig. B23

5. Click **Close** or the X button to close the windows.

### B.3.3.4 Using the Sites Tab Page

To view network information on the **SITES** tab page:

1. Click the **SITES** tab to open the Site page.
2. Locate the site name under the **Name** column and then click the network link for the site under the **Networks** column. The **Network for [Site name]** window opens (Fig. B24).

Site											
Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone	
HQ	Create New	SunPower, Inc.	Back 40 trackers (P:1), R&D lab (P:0), R&D Lab 3 (P:3), ... (4)	37.9125	-122.3579	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:locked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Sonoma Water District	Sonoma CA USA	SunPower, Inc.	Sonoma Network 1 (P:1)	38.25284	-122.44142	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:unlocked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

Network for Sonoma Water District TZ:-08:00

Name	Pan	Units	Coordinator info
Sonoma Network 1	1	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
1 Found			

Fig. B24

3. Locate the network under the **Name** column and then click **Show** under the rightmost column. The **Show Network** window appears (Fig. B25).

Site											
Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone	
HQ	Create New	SunPower, Inc.	Back 40 trackers (P:1), R&D lab (P:0), R&D Lab 3 (P:3), ... (4)	37.9125	-122.3579	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:locked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Sonoma Water District	Sonoma CA USA	SunPower, Inc.	Sonoma Network 1 (P:1)	38.25284	-122.44142	Stow site	Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs.	Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots.	TMAC:locked, Wireless:unlocked	Pacific Time (US & Canada)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

Network for Sonoma Water District TZ:-08:00

**Show Network**

Name	Pan	Units	Coordinator info
Sonoma Network 1	1	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)	<a href="#">Close</a>
Coordinator Host	-		
Coordinator Port	-		
Coordinator Login	-		
Coordinator Password	-		

1 Found

Fig. B25

4. Click **Close** or the X button to close the windows.

## B.3.4 Viewing DTMAC Unit Information

You can view DTMAC unit information through links that display the unit-level view on the main or **DASHBOARD** tab page, and in the **Show Unit** window that you can open through links on the Network and Unit pages.

### B.3.4.1 Using the Main or Dashboard Tab Page

To view DTMAC unit information on the main or **DASHBOARD** tab page:

1. Click the site name in the site list.
2. In the expanded pane for the selected site, click the DTMAC unit link to display the unit-level view. The information about the selected DTMAC unit is at the topmost section of the page (Fig. B26).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. A message bar indicates "Logged in as [username] Log out | Account" and "ALERT: 46 UNMAPPED UNITS". The main area has a left sidebar with sections like "Options" and "Search", and a list of sites under "HQ TZ:-08:00". One site, "Sonoma Water District TZ:-08:00", is expanded, showing its details: Site: Sonoma Water District TZ:-08:00, Network: Sonoma Network 1 (P:1). Below this, a list of units is shown, with the first one, "0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)", highlighted and expanded. This expanded view is framed by a red border and contains detailed information about the unit: Local time: 10:24:31 PM; Customer: SunPower, Inc.; Site: Sonoma Water District; TZ:-08:00; Time Zone: Pacific Time (US & Canada); Network: Sonoma Network 1 (P:1); Maximo Id: M0338\_AREA01\_TRK05; GPS: On; PAN ID: 1; Node ID: 0 (coordinator); Mac: 00:13:a2:00:40:3c:35:2e; Assembly: ; Stow Status: tracking; NWS Stow: normal. It also includes configuration details: Stow configuration: Stow at wind speed of 60.0 knots, gust speed of 80.0 knots with an advance time of 24.0hrs; Unstow configuration: Unstow manually at wind speed of 40.0 knots, gust speed of 60.0 knots. To the right of the unit details is a map showing the location of the unit, with a red marker indicating its position. Below the map, it says "Click marker to open map in a new tab." At the bottom of the expanded view, there are buttons for "GRAPHICS" and "MOTOR POSITION AND RETROPOINT". The bottom of the main interface shows a timeline with dates: 2010-12-19, 2010-12-24, 2010-12-29, 2011-01-03, and 2011-01-08. A "Graph type" dropdown is set to "Motor history".

Fig. B26

To view the site location map in a separate window, click the marker on the map.

3. View the DTMAC unit information.

Information	Description
<b>Local time</b>	Real-time, 12-hour format local time with AM/PM
<b>Customer</b>	Name of the customer
<b>Site</b>	The site name <b>Note.</b> The site name is an active link. Click to view the site information (refer to Section B.3.2).
<b>Time Zone</b>	The time zone in text
<b>Network</b>	The name of the network to which the DTMAC unit belongs <b>Note.</b> The network name is an active link. Click to view the network information (refer to Section B.3.3).
<b>Maximo Id</b>	The description or name of the DTMAC used as identifier for reporting in Maximo
<b>GPS</b>	GPS is enabled (or <i>On</i> ) when a GPS receiver and antenna is installed into the DTMAC unit
<b>PAN ID</b>	The tracker group address
<b>Node ID</b>	The individual tracker network address
<b>Mac</b>	This address is programmed at the factory in the network interface and cannot be changed
<b>Assembly</b>	[To be added]
<b>Stowed Status</b>	Current system status
<b>NWS Stow</b>	The National Weather Service Stow-Enable indicator—ON indicates NWS is enabled; OFF, disabled. Stow and unstow parameters are defined in the Stow and Unstow configuration retrospect.
<b>Stow configuration</b>	Defines the parameters at which the controller will stow the panels
<b>Unstow configuration</b>	Defines the parameters at which the controller will allow the panels to resume normal operations

4. Use the sections in the unit-level view to perform remote monitoring and control functions:

Section	Description
<b>GRAPHS</b>	Enables you to plot unit-level data, both current and historical; for more information about graph types and procedure (refer to Section B.3.5)
<b>SYSTEM STATUS</b>	Enables you to view details of system status indicators by message types (refer to Section B.3.6)
<b>CONTROLLER EVENTS</b>	Enables you to view and add details of event reports for the controller (refer to Section B.3.7)
<b>REMOTE UPDATES</b>	<p>Enables you to perform the following tasks:</p> <ul style="list-style-type: none"> <li>• Set or modify controller parameters</li> <li>• Send commands to the controller to either stow or move the tracker to the nighttime position</li> <li>• Set the nighttime angle for all units at the site</li> </ul> <p>Refer to Section B.3.8, Section B.3.9, and Section B.3.10.</p>
<b>RECENT UPDATES</b>	<p>Enables you to view records of updates, changes, and upgrades done for the controller</p> <p>Refer to Section B.3.11.</p>

### B.3.4.2 Using the Units Tab Page

To view DTMAC unit information on the **UNITS** tab page:

1. Click the **UNITS** tab to open the Unit page (Fig. B27).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as Log out | Account  
ALERT: 46 UNMAPPED UNITS

DASHBOARD CUSTOMERS SITES NETWORKS **UNITS** USERS ROLES

**Unit**

Search Create New Maximo Mapping

Name	Maximo	Mac	Network	Description	Nodeid	Force	Assembly name	Actions
-	-	00:13:a2:00:40:3a:4c:3f	Uncategorized units (P:5)	original pan_id=2	0	version 3760		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
1: South	-	00:13:a2:00:40:3c:35:49	Back 40 trackers (P:1)	South unit, router	1	version 3105		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
0: Center-East	M0338_AREA01_TRK05	00:13:a2:00:40:3c:35:2e	Sonoma Network 1 (P:1)	Coordinator (#5)	0	version 404		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Hammer prototype	-	00:13:a2:00:40:3a:43:51	Back 40 trackers (P:1)	Unnamed	7	version 3073		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 1.2	M0726_A1_TRK1-2	00:13:a2:00:40:54:f7:a3	Exelon Network 1 (P:1)	original pan_id=2	0	version 119		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
My tracker	-	00:13:a2:00:40:4c:1b:00	R&D Lab 3 (P:3)	original pan_id=3	7	version 44		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
-	-	00:13:a2:00:40:3a:4c:41	R&D Lab 3 (P:3)	original pan_id=3	0	version 564		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 1.1	M0726_A1_TRK1-1	00:13:a2:00:40:3a:43:55	Exelon Network 1 (P:1)	original pan_id=1	1	version 78		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 1.4	M0726_A1_TRK1-4	00:13:a2:00:40:3c:35:33	Exelon Network 1 (P:1)	original pan_id=1	3	version 74		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 2.2	M0726_A1_TRK2-2	00:13:a2:00:40:54:f7:ad	Exelon Network 2 (P:2)	original pan_id=2	0	version 81		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 2.3	M0726_A1_TRK2-3	00:13:a2:00:40:3c:35:3b	Exelon Network 2 (P:2)	original pan_id=2	4	version 67		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 2.1	M0726_A1_TRK2-1	00:13:a2:00:40:3b:b5:85	Exelon Network 2 (P:2)	original pan_id=2	1	version 73		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 6.2	M0726_A1_TRK6-2	00:13:a2:00:40:3a:43:5b	Exelon Network 4 (P:4)	original pan_id=4	0	version 86		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 6.3	M0726_A1_TRK6-3	00:13:a2:00:40:3b:b5:52	Exelon Network 4 (P:4)	original pan_id=4	4	version 69		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Tracker 6.4	M0726_A1_TRK6-4	00:13:a2:00:40:3b:b5:51	Exelon Network 4 (P:4)	original pan_id=4	6	version 67		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

120 Found [1](#) [2](#) [3](#) .. [8](#) [Next](#)

Fig. B27

2. Locate the DTMAC unit by its name, Maximo ID, or Mac address under the **Name**, **Maximo**, or **Mac** column, respectively, and the name of the network to which the controller belongs. Use the scroll bar or page selector at the bottom of the page as necessary.

Alternately, you can filter the list by using the search function. Click **Search** and enter the controller unit name, Maximo ID, or Mac address (for example, Maximo ID M0726\_A1\_TRK-2) in the **Search Terms** field and then click **Search** (Fig. B28).

TMAC™ ADVANCED TRACKER CONTROLLER								
SUNPOWER								
DASHBOARD CUSTOMERS SITES NETWORKS UNITS USERS ROLES								
ALERT: 46 UNMAPPED UNITS								
<b>Unit</b>								
<input type="text" value="Search Terms"/> <b>Search</b> <b>Reset</b> <a href="#">Create New</a> <a href="#">Maximo Mapping</a>								
Name	Maximo	Mac	Network	Description	Nodeid	Force	Assembly name	
-	-	00:13:a2:00:40:3a:4c:3f	Uncategorized units (P:5)	original pan_id=2	0	version 3760		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
1: South	-	00:13:a2:00:40:3c:35:49	Back 40 trackers (P:1)	South unit, router	1	version 3105		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
0: Center-East	M0338_AREA01_TRK05	00:13:a2:00:40:3c:35:2e	Sonoma Network 1 (P:1)	Coordinator (#5)	0	version 404		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

Fig. B28

3. The page displays the filtered list based on the search entry (Fig. B29). Click **Show** under the last (untitled) column to display the DTMAC unit information.

TMAC™ ADVANCED TRACKER CONTROLLER								
SUNPOWER								
DASHBOARD CUSTOMERS SITES NETWORKS UNITS USERS ROLES								
ALERT: 46 UNMAPPED UNITS								
<b>Unit</b>								
<input type="text" value="M0726_A1_TRK1-2"/> <b>Search</b> <b>Reset</b> <a href="#">Create New</a> <a href="#">Maximo Mapping</a>								
Name	Maximo	Mac	Network	Description	Nodeid	Force	Assembly name	
(Filtered)								
Tracker 1.2	M0726_A1_TRK1-2	00:13:a2:00:40:54:f7:a3	Exelon Network 1 (P:1)	original pan_id=2	0	version 119		<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <b>Show</b>
1 Found								

Fig. B29

4. View the DTMAC unit information in the **Show Unit** window (Fig. B30).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there's a navigation bar with links for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS (which is highlighted in yellow), USERS, and ROLES. On the right side of the header, it says "Logged in as [redacted]" and "ALERT: 46 UNMAPPED UNITS". Below the header, there's a search bar with the placeholder "Search" and a "Create New" button. A "Maximo Mapping" link is also present.

The main area is titled "Unit" and contains a table with columns: Name, Maximo, Mac, Network, Description, Nodeid, Force, and Assembly name. A search input field with the value "M0726\_A1\_TRK1-2" is at the top of the table. Below the table, a message "(Filtered)" is displayed. The table shows one row of data:

Name	Maximo	Mac	Network	Description	Nodeid	Force	Assembly name
Name	Tracker 1.2						
Maximo	M0726_A1_TRK1-2						
Mac	00:13:a2:00:40:54:f7:a3						
Network	Exelon Network 1 (P:1)						
Description	original pan_id=2						
Admin	tmac_admin@sunpowercorp.com						
Email report	false						
Nodeid	0						
Updated at	Wed, 26 Jan 2011 09:54:08 +0000						
Assembly	-						

**Show Unit** is displayed above the table, and there are "Close" and "X" buttons in the top right corner of the window. At the bottom left, it says "1 Found".

Fig. B30

5. Click **Close** or the X button to close the **Show Unit** window. Click **Reset** to display the complete unit list.

### B.3.4.3 Using the Networks Tab Page

To view DTMAC unit information on the **NETWORKS** tab page:

1. Click the **NETWORKS** tab to open the Network page.
2. Locate the site and network names under the **Site** and **Name** columns, respectively. Use the search function to filter the list by the network name.
3. Click the DTMAC unit link under the **Units** column to open the **Unit for [Network name]** window (Fig. B31).

Site	Name	Pan	Units	Coordinator info
HQ TZ:-08:00	Back 40 trackers	1	1: South (PN:1?/1), Hammer prototype (PN:1?/7)	166.131.61.17:2934 as root/sunpower1

Unit for Back 40 trackers (P:1)						
Name	Maximo	Mac	Description	Nodeid	Force	Assembly name
1: South	-	00:13:a2:00:40:3c:35:49	South unit, router	1	version 3105	<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
Hammer prototype	-	00:13:a2:00:40:3a:43:51	Unnamed	7	version 3073	<a href="#">Updates</a> <a href="#">Messages</a> <a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>

2 Found

Sonoma Water District TZ:-08:00	Sonoma Network 1	1	0: Center-East (M0338_AREA01_TRK05 PN:1/0), 00:13:a2:00:40:5e:09:ad (M0338_AREA01_TRK06 PN:1/6), 00:13:a2:00:40:5e:09:b2 (M0338_AREA01_TRK04 PN:1/4), ... (6)	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Show</a>
---------------------------------	------------------	---	---	--

Fig. B31

4. Click **Show** within the row for the DTMAC unit you want to view. The **Show Unit** window appears (Fig. B32).

Site	Name	Pan	Units	Coordinator info
HQ TZ:-08:00	Back 40 trackers	1	1: South (PN:1?/1), Hammer prototype (PN:1?/7)	166.131.61.17:2934 as root/sunpower1

Unit for Back 40 trackers (P:1)						
Name	Maximo	Mac	Description	Nodeid	Force	Assembly name
<b>Show Unit</b>						
Name	<b>1: South</b>					
Maximo	-					
Mac	00:13:a2:00:40:3c:35:49					
Description	South unit, router					
Admin	tmac_admin@sunpowercorp.com					
Email report	false					
Nodeid	1					
Updated at	Thu, 30 Sep 2010 00:05:03 +0000					
Assembly	-					

**Close**

Fig. B32

5. Click **Close** or the X button to close the windows.

## B.3.5 Using the Graph

On the main or DASHBOARD tab page, you can plot the following graph types for a site, network, or DTMAC unit:

Level	Graph type	Description
Site	<b>Motor history</b>	Plots motor position against programmed setpoint values for each tracker in the site
	<b>Motor ontime</b>	Plots the amount of time that the motor is turned on for each tracker in the site
	<b>Motor cycles</b>	Plots the number of times that the motor is switched on and off for each tracker in the site
	<b>Motor errors</b>	Plots the differential between motor position and setpoint values for each tracker in the site
	<b>Torque-tube slope</b>	Plots the torque tube Pitch against Roll for each tracker in the site
	<b>Current wireless signal strength</b>	Plots current minimum, maximum, and average signal strength values (in dB) for each tracker in the site
	<b>Wireless signal strength history</b>	Plots historical signal strength values (in dB) for each tracker in the site
	<b>Enclosure temperature</b>	Plots temperature values inside the control cabinet and the ambient temperature forecasted by the Global Forecast System (GFS) for each tracker in the site
	<b>Enclosure temperature rise</b>	Plots the rise in temperature from ambient for each tracker in the site
	<b>Ambient temperature forecast history</b>	Plots the ambient temperature forecast for the current 24 hours for the site
	<b>Ambient temperature forecast</b>	Plots the ambient temperature forecast for the next three days for the site
	<b>Wind forecast history</b>	Plots wind and gust speed forecast for the site
	<b>Wind forecast</b>	Plots wind and gust speed forecast for the next three days for the site
	<b>Cloud cover forecast history</b>	Plots cloud cover and relative humidity forecast for the current 24 hours for the site
	<b>Cloud cover forecast</b>	Plots cloud cover and relative humidity forecast for

		the next three days for the site
	<b>UV-B downward solar flux forecast history</b>	Plots the UV-B solar flux and clear sky solar flux forecast for the current 24 hours for the site
	<b>UV-B downward solar flux forecast</b>	Plots the UV-B solar flux and clear sky solar flux forecast for the next three days for the site
	<b>Analog standard deviation</b>	Plots the analog input deviation in millivolts for the site
Network	<b>Motor history</b>	Plots motor position against programmed setpoint values for each tracker within the network
	<b>Motor ontime</b>	Plots the amount of time that the motor is turned on for each tracker attached to the DTMAC Coordinator unit
	<b>Motor cycles</b>	Plots the number of times that the motor is switched on and off for each tracker within the network (attached to the DTMAC Coordinator unit)
	<b>Motor errors</b>	Plots the differential between motor position and setpoint values for each tracker within the network
	<b>Torque-tube slope</b>	Plots the torque tube Pitch against Roll for each tracker within the network
	<b>Current wireless signal strength</b>	Plots current minimum, maximum, and average signal strength values (in dB) for each tracker within the network
	<b>Wireless signal strength history</b>	Plots historical signal strength values (in dB) for each tracker within the network
	<b>Enclosure temperature</b>	Plots temperature values inside the control cabinet and the ambient temperature forecasted by GFS for each tracker within the network
	<b>Enclosure temperature rise</b>	Plots the rise in temperature from ambient for each tracker within the network
	<b>Analog standard deviation</b>	Plots the analog input deviation in millivolts for each tracker within the network
DTMAC Unit	<b>Motor history</b>	Plots motor position against programmed setpoint values for each tracker
	<b>Motor ontime</b>	Plots the direction and the amount of time the tracker motor is turned on
	<b>Motor cycles</b>	Plots the number of times the tracker motor is switched on and off

<b>Motor errors</b>	Plots the differential between the motor position and setpoint values for each tracker
<b>Torque-tube slope</b>	Plots the torque tube Pitch against Roll for each tracker
<b>Wireless signal strength</b>	Plots current minimum, maximum, and average signal strength values (in dB) for each tracker
<b>Enclosure temperature</b>	Plots the enclosure temperature and ambient temperature for each tracker
<b>Sun position</b>	Plots the position of the sun
<b>Server history</b>	Plots the quality of connection to the DTMAC Admin Server for each tracker
<b>Server performance</b>	Plots the transaction time in milliseconds from the server
<b>Wireless RX</b>	Plots the quality of received data
<b>Wireless AT</b>	Plots the quality of the transmitted data on the wireless network
<b>Wireless TX</b>	Plots the quality of transmitted data to the DTMAC Admin Server
<b>Analog limit</b>	Plots the minimum and maximum analog limits in millivolts for the tracker
<b>Analog standard deviation</b>	Plots the analog input deviation in millivolts for the tracker

To illustrate, perform the following steps to view on the graph the motor position error data for a DTMAC unit—for example, *Center-East (M0338\_AREA01\_TRK05 PN:1/0)* installed at *Sonoma Water District TZ:-08:00*—over the last three days.

1. On the main or **DASHBOARD** tab page, click *Sonoma Water District TZ:-08:00* in the site list.
2. In the expanded pane for the site, click *Center-East (M0338\_AREA01\_TRK05 PN:1/0)*.

3. In the **GRAPHS** section, select *Motor errors* in the **Graph type** drop-down list (Fig. B33).

**Note.** The **GRAPHS** section is right below the **Unit: [DTMAC Unit]** section. Use the scroll bar on the right side of the page.

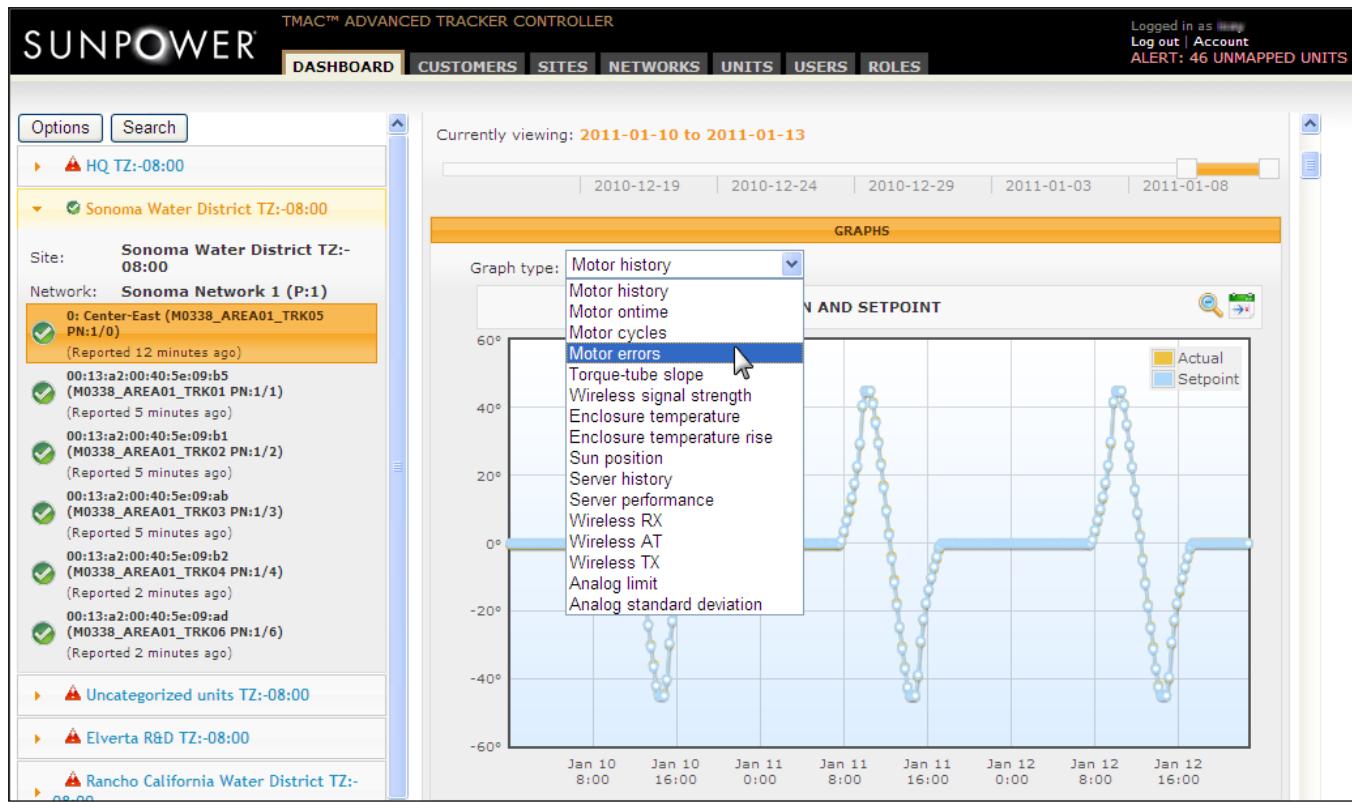


Fig. B33

4. View the **MOTOR POSITION ERROR** graph for *Center-East (M0338\_AREA01\_TRK05 PN:1/0)* (Fig. B34). Check the days for which you are viewing data indicated above the **GRAPHS** title bar.



Fig. B34

5. To view older data, move the left-end square of the slider to the left. At a time, you can plot up to three days' worth of data. To view data two or a day at a time, decrease the width of the slider by moving the right-end square to the left (Fig. B35). The message *Graph does not show current data* is displayed if the graph currently plotted is for historical data.



Fig. B35

To view graph data for a site or network, click the site or network name link to display the site- or network-level view, respectively, and then select a graph type in the **Graph type** drop-down list.

Fig. B36 shows Sonoma Water District TZ:-08:00 selected as site view and the site-level **Graph type** options.

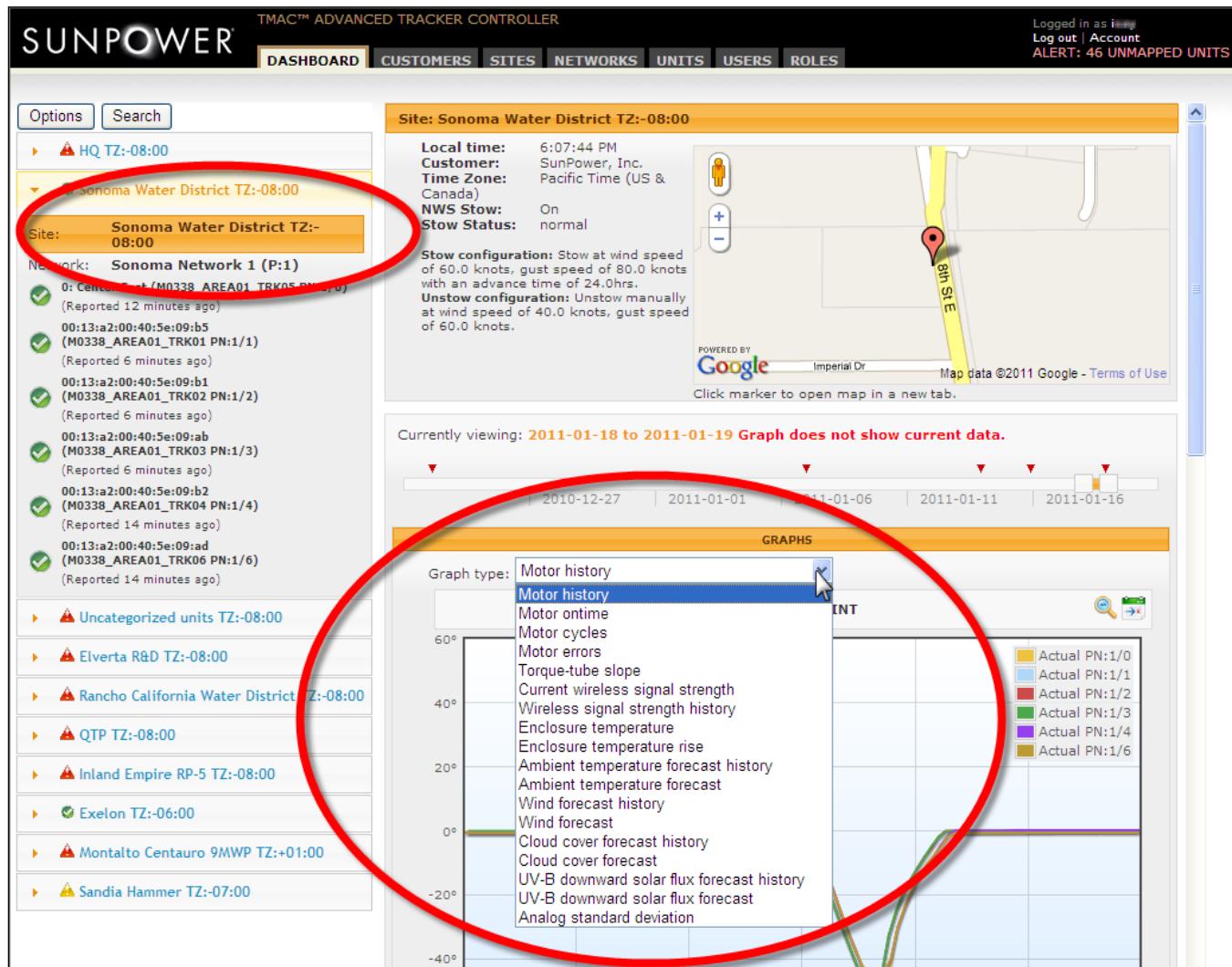


Fig. B36

## B.3.6 Viewing System Status

On the main or **DASHBOARD** tab page, you can view system status indicators by message types for each DTMAC unit:

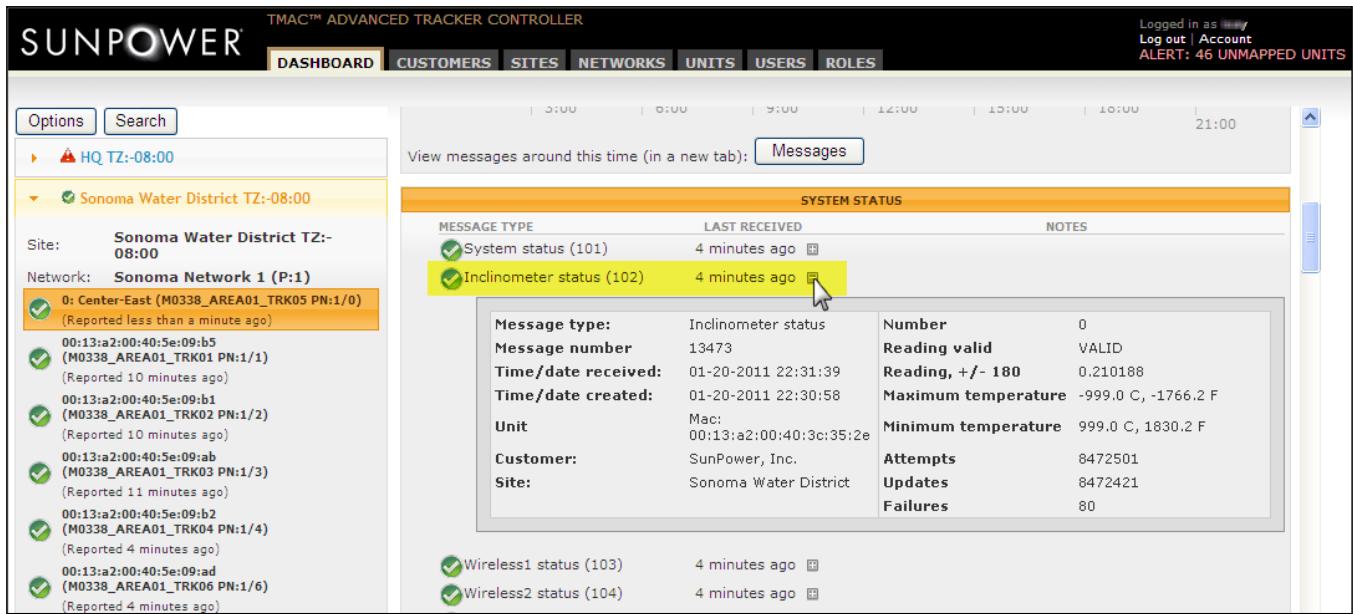
1. In the site list, click the site name and then the DTMAC unit link to display the unit-level view.
2. Scroll down to the **SYSTEM STATUS** section (below the **GRAPHS** section) where message types are listed according to when each was last received (Fig. B37).

The screenshot shows the TMAC™ Advanced Tracker Controller interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. On the right side of the header, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the header, there's a timeline from 3:00 to 21:00. A red arrow points to a specific message entry in the "MESSAGES" list: "0: Center-East (M0338\_AREA01\_TRK05 PN:1/0) (Reported less than a minute ago)". This message is highlighted with a yellow box. To the right of the timeline, a red oval encloses the "SYSTEM STATUS" table, which lists various message types and their last receive times. All entries show a "4 minutes ago" timestamp.

MESSAGE TYPE	LAST RECEIVED	NOTES
System status (101)	4 minutes ago	[link]
Tiltmeter status (102)	4 minutes ago	[link]
Wireless1 status (103)	4 minutes ago	[link]
Wireless2 status (104)	4 minutes ago	[link]
Wireless3 status (105)	4 minutes ago	[link]
Operating system status (106)	4 minutes ago	[link]
GPS status (107)	4 minutes ago	[link]
A/D status (108)	4 minutes ago	[link]
DIO status (109)	4 minutes ago	[link]
Motor status (110)	4 minutes ago	[link]
Settings1 status (114)	4 minutes ago	[link]
Settings2 status (115)	4 minutes ago	[link]
Server status (116)	4 minutes ago	[link]
Tracker status (117)	4 minutes ago	[link]

Fig. B37

3. To view the details of a message type—for example, *Inclinometer status (102)*, click the  (Expand) button under the **LAST RECEIVED** column to expand the row (Fig. B38).



MESSAGE TYPE	LAST RECEIVED	NOTES
 System status (101)	4 minutes ago 	
 Inclinometer status (102)	4 minutes ago 	
<b>Message type:</b> Inclinometer status <b>Message number:</b> 13473 <b>Time/date received:</b> 01-20-2011 22:31:39 <b>Time/date created:</b> 01-20-2011 22:30:58 <b>Unit:</b> Mac: <b>Customer:</b> SunPower, Inc. <b>Site:</b> Sonoma Water District	<b>Number</b> 0 <b>Reading valid</b> VALID <b>Reading, +/- 180</b> 0.210188 <b>Maximum temperature</b> -999.0 C, -1766.2 F <b>Minimum temperature</b> 999.0 C, 1830.2 F <b>Attempts</b> 8472501 <b>Updates</b> 8472421 <b>Failures</b> 80	
 Wireless1 status (103)	4 minutes ago 	
 Wireless2 status (104)	4 minutes ago 	

**Fig. B38**

4. Click the  (Collapse) button to hide the details.
5. Perform Steps 3–4 to view the details of other message types.

## B.3.7 Viewing and Adding Controller Events

On the main or DASHBOARD tab page, you can view details of controller events for each DTMAC unit.

### B.3.7.1 Viewing Controller Events

1. In the site list, click the site name and then the DTMAC unit link to display the unit-level view.
2. Scroll down to the **CONTROLLER EVENTS** section where controller events are listed according to when they were last received (Fig. B39).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is selected. On the left, there's a sidebar with a tree view showing a root node 'HQ TZ:-08:00' expanded to show 'Sonoma Water District TZ:-08:00'. This node has several children representing DTMAC units. One specific unit, '0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)' is highlighted with an orange box and a red arrow pointing to it. To the right of the sidebar is a large table titled 'CONTROLLER EVENTS'. The table has two columns: 'EVENT' and 'LAST RECEIVED'. The 'EVENT' column lists various controller events, such as 'Modem status frame Subsystem: Tsnet Priority: Always Id: Tsnet\_ms Tag: 0' and 'Modem status frame Subsystem: Tsnet Priority: Always Id: Tsnet\_ms Tag: 12'. The 'LAST RECEIVED' column shows the timestamp for each event, all of which are dated '01-20-2011 12:46:07'. A red oval highlights the entire 'CONTROLLER EVENTS' table area.

Fig. B39

3. To view the details of a controller event—for example, the event report at the top of the list, click the (Expand) button under the **LAST RECEIVED** column to expand the row (Fig. B40).

This screenshot is similar to Fig. B39 but shows the 'Controller Events' table after an expansion action. The first row of the table, which contains the event '0c,cdff,0000000000002301,00,0c,00 Subsystem: Tsnet Priority: Always Id: Tsnet\_ms Tag: 0 01-20-2011 12:46:07', has been expanded. An expand icon () is visible to the right of the 'LAST RECEIVED' column for this row. A tooltip or callout bubble points to this icon, indicating that clicking it will expand the row to show detailed information. The expanded row displays a detailed table with columns for 'Message type', 'Event report', 'Message', 'Priority', 'Subsystem', 'Time/date received', 'Time/date created', 'ID', 'Unit', 'Mac', 'Customer', 'Site', and 'Tag'. The 'Message' column shows the raw event data, and the 'Priority' column indicates 'Always (4)'. The 'Subsystem' column specifies 'Tsnet (Related to wireless network. 5)'. The 'ID' column is 'Tsnet\_ms'. The 'Unit' column is '00:13:a2:00:40:3e:35:2e'. The 'Customer' column is 'SunPower, Inc.'. The 'Site' column is 'Sonoma Water District'. The 'Tag' column is '0 (00000000)'.

Fig. B40

4. Click the  (Collapse) button to hide the details.
5. Perform Steps 3–4 to view the details of other controller events.

### B.3.7.2 Adding Controller Events

1. Scroll down to the bottom of the **CONTROLLER EVENTS** section.
2. Click *Add event*.
3. Enter the controller event report in the **Explore User Prompt** screen and then click **OK** (Fig. B41).

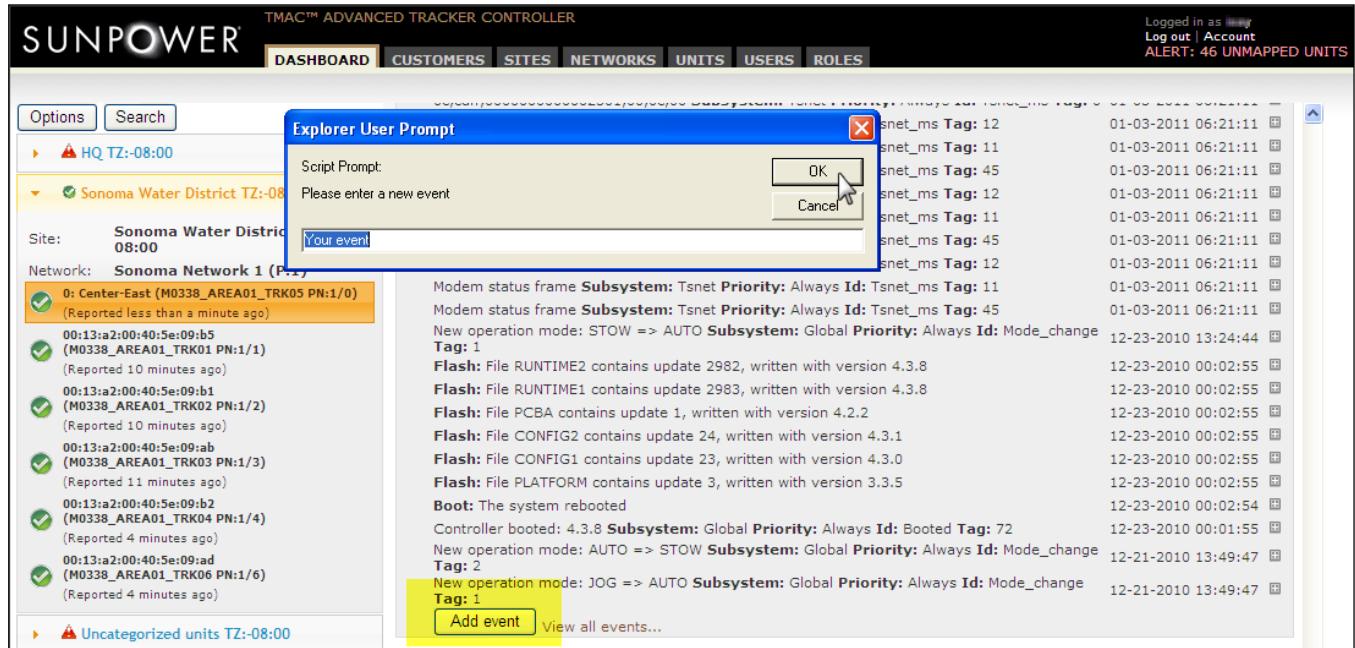


Fig. B41

## B.3.8 Setting or Modifying Configuration Parameters

**Important!** Each controller is programmed to check the DTMAC server for updates approximately every 5 minutes. Ensure that you carefully enter and verify values before sending a remote command to set or modify a controller's configuration parameters.

You enter or select values to configure or send updates to the controller through a screen that contains the **REMOTE UPDATE FOR [DTMAC UNIT]** and **COMMISSIONING** forms. The screen can be accessed through links on the main and Unit pages.

### B.3.8.1 Using the Main or Dashboard Tab Page

To set or modify controller configuration parameters:

1. In the site list, click the site name and then the DTMAC unit link to display the unit-level view.
2. Scroll down to the **REMOTE UPDATES** section.
3. Click *Remote update* (Fig. B42).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there is a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. On the right side of the header, it says "Logged in as i... Log out | Account" and "ALERT: 46 UNMAPPED UNITS".

The main area has a sidebar on the left listing sites and networks. One site, "Sonoma Water District TZ:-08:00", is expanded, showing its network details: "Sonoma Network 1 (P:1)" and a list of units under "0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)".

The central part of the screen is titled "REMOTE UPDATES". It contains several buttons: "Remote update" (which is highlighted with a red circle), "Administer unit", "MOVE ALL UNITS AT THIS SITE", "STOW", "NIGHT", and "Set nighttime angle". Below these buttons, there is a text box with instructions about changing commissioning parameters and a note about nighttime angles.

At the bottom of the screen, there is a "RECENT UPDATES" section with a table of recent events:

Event Details	Date
v404 by system user • FW V4.3.8 installed on TMAC	09-23-2010 09:22:29
v403 by Steve Kraft • FW upgrade request; V4.3.8	09-23-2010 09:20:24
v402 by system user • FW V4.2.2 installed on TMAC	09-02-2010 15:42:05

Fig. B42

4. The screen with the **REMOTE UPDATE FOR [DTMAC UNIT]** and **COMMISSIONING** forms appears (Fig. B43).

**REMOTE UPDATE FOR UNIT 0: CENTER-EAST (M0338\_AREA01\_TRK05 PN:1/0)**

**Send tracker to stow position?**  check this box to stow this unit

**Send tracker to normal nighttime position?**  check this box to position this unit at the normal nighttime position

**Forced to stow from weather forecast?**  This box can be checked as a result of the NWS forecast settings for this site. If the site's configuration for "Enable automatic unstow after wind abates?" is set to false, this must be unset manually to allow the unit to continue operating normally.

**Error reset?**  check this box to reset errors on the controller.  
**Use only when someone is on-site!**

**Reboot controller?**  check this box to reboot the controller

**Desired firmware version:**  0  0  0  0 Firmware needs to be available on correct FTP server, and must be properly named, in order for this setting to cause a firmware upgrade

**Site configuration from server?:**  This box must be checked in order for the settings below to take effect

**Site as-built parameters**

**Latitude:** 38.25284 positive is North of the equator

**Longitude:** -122.44142 positive is East of Prime Meridian, negative is west

**Site slope:** -1 positive is sloping down to East

**Torque tube slope:** 0 positive is sloping down to South

**N/S misalignment:** 0 positive is rotated clockwise looking down

**East/west GCR:** 0.52

**End of the tracker on which the TMAC is mounted**: EAST T20 trackers should be configured as WEST mount

**High-wind stow**

0 Degree to stow trackers in case

**Save changes** **Cancel**

Fig. B43

Enter or select the following under the **COMMISSIONING** section and then click **Save changes** at the lower right of the screen:

<b>Site configuration from server?:</b>	Select this check box after you enter all values in the parameter fields and before you click <b>Save changes</b> .
<b>Site as-built parameters</b>	
<b>Latitude:</b>	Enter latitude coordinates.
<b>Longitude:</b>	Enter longitude coordinates.
<b>Site slope:</b>	Enter the site slope.
<b>Torque tube slope:</b>	Enter the slope of the fully installed torque tubes. The value is positive when the south end of the array is lower than the north.

<b>N/S misalignment:</b>	Enter the number of degrees by which the torque tube alignment is off from true N-S. If the value is positive, the tube alignment is clockwise from true N-S when assessed from overhead.
<b>East/west GCR:</b>	Enter the percentage of total ground surface taken up by the system when viewed from above with the modules flat. A smaller GCR means that modules are proportionally farther apart. GCR should typically be in the range of 0.35 for a ground-mounted system, and 0.50 for an elevated system.
<b>End of the tracker on which the DTMAC is mounted</b>	Select the side of the array on which the drive unit is installed. <b>Important!</b> Always select <i>WEST</i> for T20 Trackers.
<b>High-wind stow</b>	
<b>Stow position</b>	Enter the number of degrees at which the modules are positioned during high wind.
<b>Stow on disconnect?</b>	Select this check box to command the controller to stow the tracker 24 hours after loss of network connection.
<b>Nighttime behavior</b>	
<b>Nighttime position</b>	Enter the number of degrees at which the modules are positioned and at which they remain overnight.
<b>Alternate nights?</b>	Select this check box to command the controller to set the tracker at the nighttime position on even/odd days.
<b>Motor</b>	
<b>Deadband</b>	Enter the deadband value.
<b>Hysteresis</b>	Enter the hysteresis value.
<b>Debug</b>	
<b>Status interval:</b>	Enter the value that corresponds to the number of minutes between status messages. A status interval of 0 (typical) corresponds to default interval of 15 minutes.
<b>Configure additional error reporting:</b>	Select a preference for error reporting.

### B.3.8.2 Using the Units Tab Page

To set or modify controller configuration parameters:

1. Click the **UNITS** tab to open the Unit page.
2. Locate the DTMAC unit using the search function. Enter the controller name, Maximo ID, or Mac address in the **Search Terms** field and click **Search**.
3. Click the version link under the **Force** column to open the window that contains the **REMOTE UPDATE FOR [DTMAC UNIT]** and **COMMISSIONING** forms (Fig. B44).

**Fig. B44**

4. Enter or select values in the **COMMISSIONING** form and save the changes (refer to table of parameters in this section).

## B.3.9 Sending Remote Updates

**Important!** Each controller is programmed to check the DTMAC server for updates approximately every 5 minutes. Ensure that you carefully enter settings or verify parameters before sending an operational command to the controller.

You enter or select values to configure or send updates for a controller through a screen that contains the **REMOTE UPDATE FOR [DTMAC UNIT]** and **COMMISSIONING** forms. The screen can be accessed through links on the main and Unit pages.

### B.3.9.1 Using the Main or Dashboard Tab Page

To send updates for a controller using the main or **DASHBOARD** tab page:

1. In the site list, click the site name and then the DTMAC unit link to open the unit-level view.
2. Scroll down to the **REMOTE UPDATES** section and click *Remote update*.
3. Select check boxes or enter values in the **REMOTE UPDATE FOR [DTMAC UNIT]** form in the screen (Fig. B45). Click *Save changes* to commit the information and send the command.

The screenshot shows two overlapping windows. The left window is titled "REMOTE UPDATE FOR UNIT 0: CENTER-EAST (M0338\_AREA01\_TRK05 PN:1/0)". It contains several configuration options with checkboxes:

- Send tracker to stow position?
- Send tracker to normal nighttime position?
- Forced to stow from weather forecast?  This box can be checked as a result of NWS forecast settings for this site. If the site's configuration for "Enable automatic unstow after wind abates?" is set to false, this must be unset manually to allow the unit to continue operating normally.
- Error reset?  Use only when someone is on-site!
- Reboot controller?
- Desired firmware version:  0  0  0  0 Firmware needs to be available on correct FTP server, and must be properly named, in order for this setting to cause a firmware upgrade

The right window is titled "COMMISSIONING". It contains site parameters:

Site configuration from server?	<input checked="" type="checkbox"/> This box must be checked in order for the settings below to take effect
Site as-built parameters	
Latitude:	38.25284 positive is North of the equator
Longitude:	-122.44142 positive is East of Prime Meridian, negative is west
Site slope:	-1 positive is sloping down to East
Torque tube slope:	0 positive is sloping down to South
N/S misalignment:	0 positive is rotated clockwise looking down
East/west GCR:	0.52
End of the tracker on which the TMAC is mounted	EAST T20 trackers should be configured as WEST mount
High-wind stow	
0 Degree to stow trackers in case	

At the bottom right are "Save changes" and "Cancel" buttons.

Fig. B45

<b>Send tracker to stow position?</b>	Select this check box to send the command to the controller to place the tracker unit in Stow at an angle entered in the <b>Stow position</b> field in the <b>High-Wind Stow</b> section under <b>COMMISSIONING</b> .
<b>Send tracker to normal nighttime position?</b>	Select this check box to send the command to the controller to place the tracker in the normal nighttime position. The tracker will remain in this nighttime position until you clear (deselect) this check box.
<b>Forced to stow from weather forecast?</b>	Select this check box to send the command to the controller to place the tracker unit in nighttime position at an angle indicated in the <b>Nighttime behavior</b> section under <b>COMMISSIONING</b> .  If the <b>Enable automatic unstow after wind abates?</b> is set to <i>False</i> in the configuration for the site, this must be unset manually to allow the unit to continue operating normally.
<b>Error reset?</b>	Select this check box to reset errors in the controller.
<b>Reboot controller?</b>	Select this check box to reboot the controller.  <b>Warning!</b> Use this command only when authorized personnel are onsite.
<b>Desired firmware version:</b>	Enter the firmware version to remotely send a firmware upgrade to the controller.

### B.3.9.2 Using the Units Tab Page

To send updates for a controller using the **UNITS** tab page:

1. Click the **UNITS** tab to open the Unit page.
2. Locate the DTMAC unit using the search function. Enter the controller name, Maximo ID, or Mac address in the **Search Terms** field and click *Search*.
3. Click the version link under the **Force** column to open the window that contains the **REMOTE UPDATE FOR [DTMAC UNIT]** and **COMMISSIONING** forms.
4. Enter or select values in the **REMOTE UPDATE FOR [DTMAC UNIT]** form in the screen (refer to table of parameters in this section). Click *Save changes* to commit the information.
5. To verify the update after the periodic check between the controller and the DTMAC server, refer to Section B.3.11.

## B.3.10 Stowing the Array and Setting the Nighttime Angle

On the main or **DASHBOARD** tab page, you can send the command to stow or move an array to the nighttime position, and set the nighttime angle for an array.

1. In the site list, click the site name and then the site name link to open the site-level view.
2. Scroll down to the **REMOTE UPDATES** section.

- To stow the array:
  - a. Click **STOW** (Fig. B46).

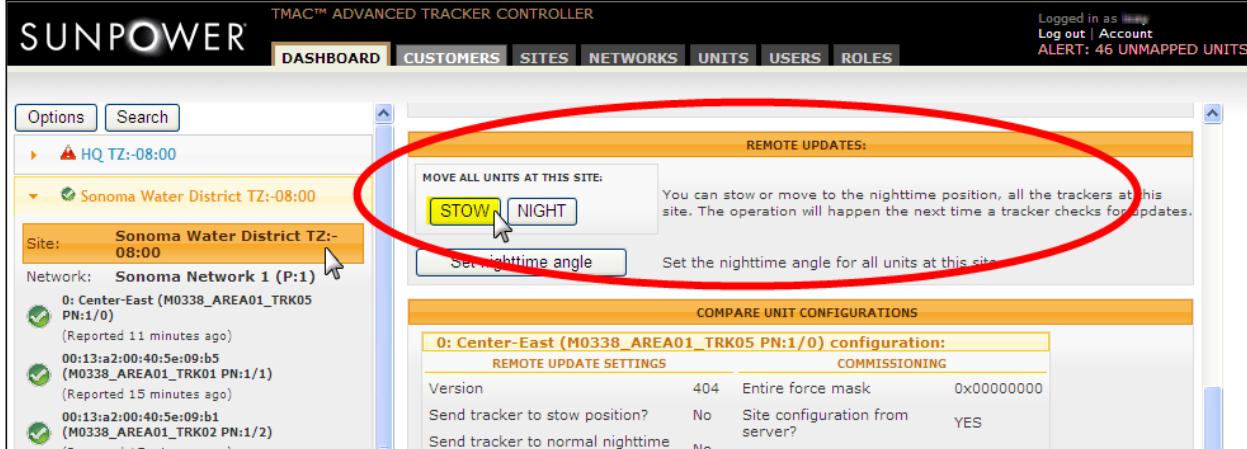


Fig. B46

- b. Click **OK** in the confirmation window (Fig. B47).

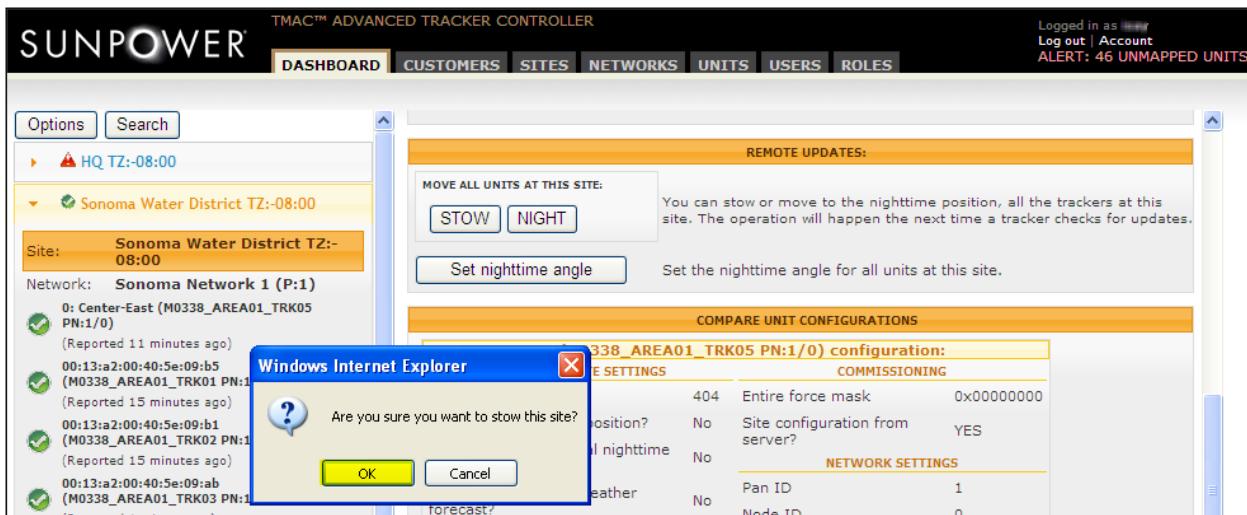


Fig. B47

- To move the array to the nighttime position:
  - a. Click **NIGHT**.
  - b. Click OK in the confirmation window (Fig. B48).

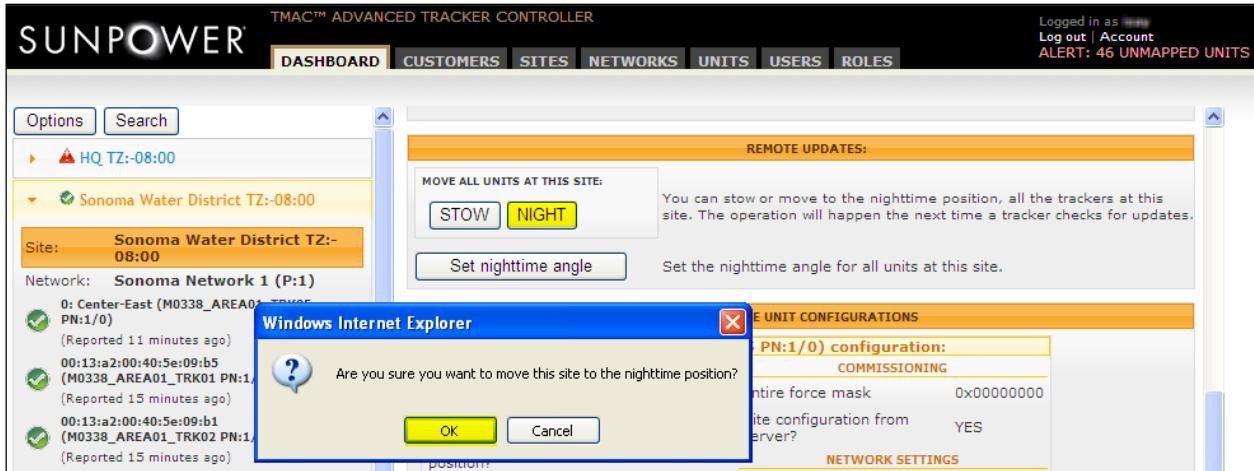


Fig. B48

- To set the nighttime angle for the array:
  - a. Click **Set nighttime angle**.
  - b. Enter the nighttime position in the **Explorer User Prompt** screen and click OK (Fig. B49).

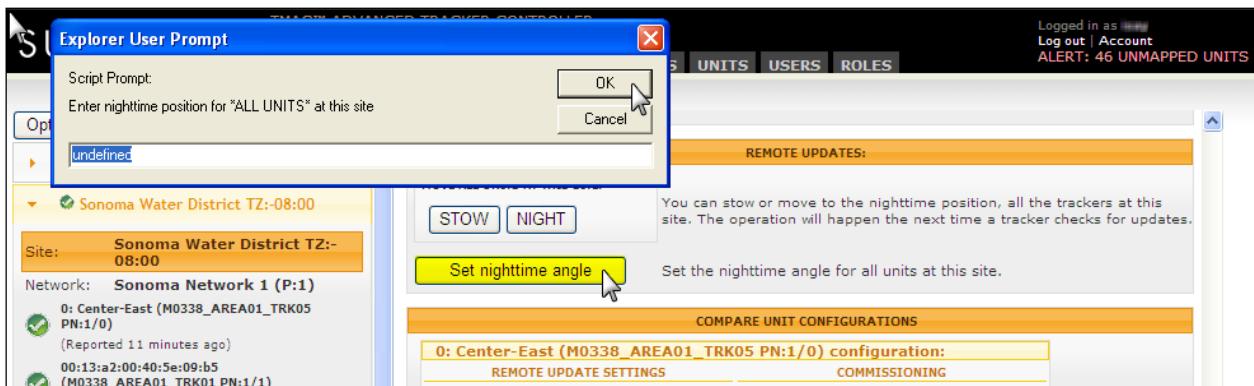


Fig. B49

**Important!** You can also send these commands using the **REMOTE UPDATES** section in the unit-level view for any DTMAC installed in the site. To open the unit-level view, refer to Section B.3.4.

## B.3.11 Viewing Recent Updates

Updates for a DTMAC include records of changes in the controller configuration parameters, and both the requested and executed operational commands. You can view recent updates for a DTMAC unit on the main and Unit pages.

### B.3.11.1 Using the Main or Dashboard Tab Page

1. In the site list, click the site name and then the DTMAC unit link to open the unit-level view.
2. Scroll down to the **RECENT UPDATES** section (Fig. B50).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is selected. On the left, a sidebar lists sites: HQ TZ:-08:00, Sonoma Water District TZ:-08:00, and Uncategorized units TZ:-08:00. The Sonoma Water District entry is expanded, showing details for Network 1 (P:1) and a specific unit 0: Center-East (M0338\_AREA01\_TRK05). A red arrow points to this unit entry. To the right, a large red circle highlights the 'RECENT UPDATES' section. This section displays a list of updates:

Update Details	Date
v404 by system user • FW V4.3.8 installed on TMAC	09-23-2010 09:22:29
v405 by Steve Kraft • FW upgrade request, V4.2.8	09-23-2010 09:20:24
v402 by system user • FW V4.2.2 installed on TMAC	09-02-2010 15:42:05
v401 by Steve Kraft • FW upgrade request, V4.2.2	09-02-2010 15:39:54
v400 by Steve Kraft • Hysteresis changed from 2.0 to 0.75 • Deadband changed from 1.0 to 0.0	09-02-2010 15:37:39
v399 by system user • FW V4.3.1 installed on TMAC	09-02-2010 15:23:44
v398 by Steve Kraft • FW upgrade request, V4.3.1	09-02-2010 15:21:25
v397 by system user • FW V4.3.0 installed on TMAC	09-02-2010 15:18:51

Fig. B50

### B.3.11.2 Using the Units Tab Page

1. Click the **UNITS** tab to open the Unit page.
2. Locate the DTMAC unit using the search function. Enter the controller unit name, Maximo ID, or Mac address in the **Search Terms** field and click **Search**.
3. Click **Updates** under the last column to open the **Forcehistory for [DTMAC unit]** window (Fig. B51).

The screenshot shows the SUNPOWER TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there is a navigation bar with links for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS (which is highlighted in orange), USERS, and ROLES. On the right side of the header, it says "Logged in as [username]" and "Log out | Account". Below the header, there is a message "ALERT: 46 UNMAPPED UNITS".

The main area is titled "Unit" and contains a search bar with the text "M0338\_AREA01\_TRK05" and buttons for "Search" and "Reset". Below the search bar is a table with columns: Name, Maximo, Mac, Network, Description, Nodeid, Force, and Assembly name. A row is selected for "0: Center-East" with the value "M0338\_AREA01\_TRK05". In the "Force" column, there is a dropdown menu with the value "version 404". To the right of the table, there are buttons for "Updates" (highlighted in yellow), "Messages", "Edit", "Delete", and "Show".

A modal window titled "Forcehistory for 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)" is displayed. It has a "Search" button. The table in this window has columns: Diff, Updates, User, and Created at. The data in the table is as follows:

Diff	Updates	User	Created at
• FW V4.3.8 installed on TMAC	404	system user	09-23-2010 09:22:29
• FW upgrade request, V4.3.8	403	Steve Kraft	09-23-2010 09:20:24
• FW V4.2.2 installed on TMAC	402	system user	09-02-2010 15:42:05
• FW upgrade request, V4.2.2	401	Steve Kraft	09-02-2010 15:39:54
• Hysteresis changed from 2.0 to 0.75 • Deadband changed from 1.0 to 0.0	400	Steve Kraft	09-02-2010 15:37:39
• FW V4.3.1 installed on TMAC	399	system user	09-02-2010 15:23:44
• FW upgrade request, V4.3.1	398	Steve Kraft	09-02-2010 15:21:25
• FW V4.3.0 installed on TMAC	397	system user	09-02-2010 15:18:51

Fig. B51

4. Click **Show** under the rightmost column to view the details of each row of update in the **Force data** window (Fig. B52).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there is a navigation bar with links for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS (which is highlighted), USERS, and ROLES. The status bar indicates "Logged in as isay", "Log out | Account", and "ALERT: 46 UNMAPPED UNITS". Below the navigation bar, the main area is titled "Unit" and shows a search bar with the query "M0338\_AREA01\_TRK05". There are "Search" and "Reset" buttons. A table header row includes columns for Name, Maximo, Mac, Network, Description, Nodeid, Force, and Assembly name. Below this is a table row for unit "0: Center-East" with the identifier "M0338\_AREA01\_TRK05". The "Force" column for this row contains the value "version 404". To the right of this row are buttons for Updates, Messages, Edit, Delete, and Show. The "Show" button is highlighted in yellow. Below the table is a section titled "Forcehistory for 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)". This section includes a search bar and a table with columns for Diff, Updates, User, and Created at. The main content of this section is a table titled "Force data" with two columns: NAME and VALUE. The table lists numerous parameters and their values, such as Version (404), Send tracker to stow position? (No), and various location and orientation parameters like Latitude (38.25284) and Longitude (-122.44142). The entire screenshot is framed by a thick black border.

NAME	VALUE
Version	404
Send tracker to stow position?	No
Send tracker to normal nighttime position?	No
Forced to stow from weather forecast?	No
Error Reset?	No
Reboot Controller?	No
Entire force mask	0x00000000
Site configuration from server?	YES
Pan ID	1
Node ID	0
Latitude	38.25284
Longitude	-122.44142
Roll (degrees, + is on westerly slope)	-1.0
Pitch (degrees, + on southerly slope)	0.0
Yaw (degrees, + is southern end points east)	0.0
E/W GCR	0.52
Stow position	0.0
Stow on disconnect?	No
Nighttime position	0.0
Alternate nights	NO
Deadband	0.0 &deg;
Hysteresis	0.75 &deg;
Status interval	0
Report level	4
Firmware major version (desired)	0
Firmware minor version (desired)	0
Firmware revision (desired)	0
Firmware beta level (desired)	0
East mount	YES

Fig. B52

## B.3.12 Viewing Messages

Messages for a DTMAC consist of event and boot reports, flash status, and the different types of system status indicators. You can view messages for a controller through links on the main and Unit pages.

### B.3.12.1 Using the Main or Dashboard Tab Page

1. In the site list, click the site name and then the DTMAC unit link to open the unit-level view.
2. Scroll down to the **GRAPHS** section and click the *Messages* button below the graph area (Fig. B53).

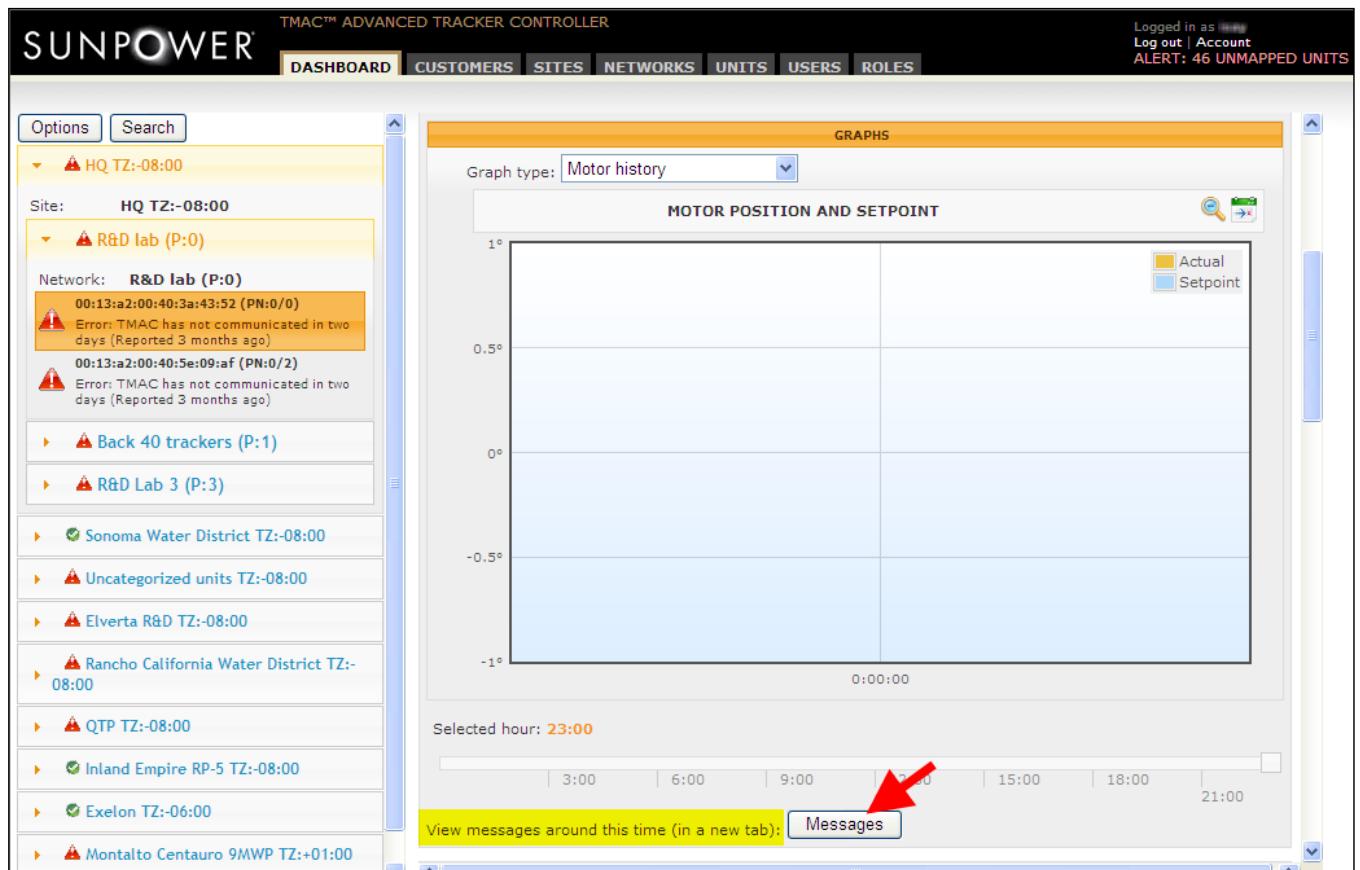


Fig. B53

3. The Message page opens in a separate window (Fig. B54).

Message							
<a href="#">Id</a>	<a href="#">Message status</a>	Name	Unit	Originated at	Created at	Desc	<a href="#">Search</a> <a href="#">Event search</a>
21617907		Controller booted: 4.3.8 <b>Subsystem:</b> Global <b>Priority:</b> Always <b>ID:</b> Booted <b>Tag:</b> 32	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:31:45	09-28-2010 17:32:46	Event report	<a href="#">Show</a>
21617911		Boot: The system rebooted	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:45	09-28-2010 17:32:47	Boot report	<a href="#">Show</a>
21617912		SCFS: 1 <b>Subsystem:</b> Flash <b>Priority:</b> Always <b>ID:</b> Config_change <b>Tag:</b> 71	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:47	Event report	<a href="#">Show</a>
21617914		GCR: 0.35 0.35 0.35 0.33 <b>Subsystem:</b> Flash <b>Priority:</b> Always <b>ID:</b> Config_change <b>Tag:</b> 71	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:47	Event report	<a href="#">Show</a>
21617916		Deadband: 0.00 0.75 <b>Subsystem:</b> Flash <b>Priority:</b> Always <b>ID:</b> Config_change <b>Tag:</b> 71	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:48	Event report	<a href="#">Show</a>
21617918		Hysteresis: 0.75 1.50 <b>Subsystem:</b> Flash <b>Priority:</b> Always <b>ID:</b> Config_change <b>Tag:</b> 71	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:48	Event report	<a href="#">Show</a>
21617919		Tracker: 0.00 0.00 0.00 <b>Subsystem:</b> Flash <b>Priority:</b> Always <b>ID:</b> Config_change <b>Tag:</b> 71	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:48	Event report	<a href="#">Show</a>
21617921		Saving: 71 0x0000 1 <b>Subsystem:</b> Flash <b>Priority:</b> Always <b>ID:</b> Config_change <b>Tag:</b> 71	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:48	Event report	<a href="#">Show</a>
21617922		Flash: File PLATFORM contains update 8, written with version 4.3.8	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:48	Flash status	<a href="#">Show</a>
21617924		Flash: File CONFIG1 contains update 9, written with version 4.3.8	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:48	Flash status	<a href="#">Show</a>
21617926		Flash: File CONFIG2 contains update 8, written with version 4.3.8	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:49	Flash status	<a href="#">Show</a>
21617927		Flash: File PCBA contains update 3, written with version 4.3.0	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:49	Flash status	<a href="#">Show</a>
21617929		Flash: File RUNTIME1 contains update 907, written with version 4.3.8	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:49	Flash status	<a href="#">Show</a>
21617931		Flash: File RUNTIME2 contains update 906, written with version 4.3.8	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:49	Flash status	<a href="#">Show</a>
21617932		Motors System status(101)	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:46	09-28-2010 17:32:49	System status	<a href="#">Show</a>
21617995		Operating system status(106)	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:49	09-28-2010 17:33:07	Operating system status	<a href="#">Show</a>
21618030		Settings1 status(114)	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:49	09-28-2010 17:33:21	Settings1 status	<a href="#">Show</a>

Fig. B54

4. Click **Show** under the rightmost column to view the details of each message type (Fig. B55).

Message							
<a href="#">Id</a>	<a href="#">Message status</a>	Name	Unit	Originated at	Created at	Desc	<a href="#">Search</a> <a href="#">Event search</a>
21617911		Boot: The system rebooted	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:45	09-28-2010 17:32:47	Boot report	<a href="#">Show</a>
<b>Message type:</b> Event report <b>Message number</b> 1 <b>Time/date received:</b> 09-28-2010 17:32:46 <b>Time/date created:</b> 09-28-2010 17:31:45 <b>Unit</b> Mac: 00:13:a2:00:40:3a:43:52 <b>Customer:</b> SunPower, Inc. (R&D) <b>Site:</b> HQ							
21617911		Boot: The system rebooted	00:13:a2:00:40:3a:43:52 (PN:0/0)	09-28-2010 17:32:45	09-28-2010 17:32:47	Boot report	<a href="#">Show</a>

Fig. B55

### B.3.12.2 Using the Units Tab Page

1. Click the **UNITS** tab to open the Unit page.
2. Locate the DTMAC unit using the search function. Enter the controller unit name, Maximo ID, or Mac address in the **Search Terms** field and click **Search**.
3. Click **Messages** under the last column to open the **Message for [DTMAC unit]** window (Fig. B56).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS (which is highlighted in yellow), USERS, and ROLES. To the right of the tabs, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the navigation bar, the main area is titled "Unit" and has a search bar containing "M0338\_AREA01\_TRK05" with "Search" and "Reset" buttons. A table below lists unit details: Name (0: Center-East), Maximo (M0338\_AREA01\_TRK05), Mac (00:13:a2:00:40:3c:35:2e), Network (Sonoma Network 1 (P:1)), Description (Coordinator (#5)), Nodeid (0), Force (version 404). To the right of the table are buttons for Updates, Messages (highlighted in yellow), Edit, Delete, and Show. A hand cursor is hovering over the "Messages" button. Below the table, a sub-section titled "Message for 0: Center-East (M0338\_AREA01\_TRK05 PN:1/0)" shows a list of messages with columns: Id, Message status, Name, Originated at, Created at, Desc, and Show. Each message row contains a green checkmark icon in the first column and a "Show" link in the last column. The messages listed are: 34274815 (Tracker status(117)), 34274814 (Motor status(110)), 34274813 (Settings2 status(115)), 34274812 (DIO status(109)), 34274811 (GPS status(107)), 34274810 (A/D status(108)), 34274809 (Server status(116)), 34274808 (Wireless3 status(105)), 34274807 (Wireless2 status(104)), 34274806 (Wireless1 status(103)), and 34274805 (Inclinometer status(102)).

Fig. B56

4. Click **Show** under the rightmost column to view the details of each message type.

## B.3.13 Viewing Alerts

Upon logging in, the main or **DASHBOARD** tab page displays the site list (on the left) and the lists of DTMACs per site that have alerts (Fig. B57). The lists under **UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:** also include units that have persistent alerts (more than 24 hours).

The screenshot shows the TMAC™ Advanced Tracker Controller interface. At the top, there's a navigation bar with tabs for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is selected. On the right, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the navigation bar, there are two sections: "Options" and "Search" buttons on the left, and a large list titled "UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:" on the right. A red circle highlights this title. The list is divided into two main sections: "SunPower, Inc." and "Montalto Centauro 9MWP TZ:+01:00". Each section contains a list of units with their specific DTMAC codes and error details.

SunPower, Inc.	
<b>Rancho California Water District TZ:-08:00</b>	
⚠	00:13:a2:00:40:66:0e:68 (M0531_AREA01_TRK04 PN:1/0)
⚠	00:13:a2:00:40:66:0d:f6 (M0531_AREA01_TRK05 PN:1/9)
⚠	00:13:a2:00:40:66:0d:c5 (M0531_AREA01_TRK13 PN:1/1)

Montalto Centauro 9MWP TZ:+01:00	
⚠	Tracker 6 (PN:1/0)
⚠	Tracker 4 (PN:1/4)
⚠	Tracker 3 (PN:1/3)
⚠	Tracker 67 (PN:1/9)
⚠	Tracker 9 (PN:1/6)
⚠	Tracker 1 (PN:1/1)
⚠	Tracker 2 (PN:1/2)
⚠	Tracker 11 (PN:1/8)
⚠	Tracker 8 (PN:1/7)
⚠	Tracker 68 (Coordinator) (PN:2/0)
⚠	Tracker 16 (PN:2/6)
⚠	Tracker 13 (PN:2/4)
⚠	Tracker 69 (PN:2/10)
⚠	Tracker 66 (PN:2/8)
⚠	Tracker 10 (PN:2/2)
⚠	Tracker 7 (PN:2/1)
⚠	Tracker 12 (PN:2/3)
⚠	Tracker 14 (PN:2/5)
⚠	Tracker 19 (PN:2/7)
⚠	Tracker 20 (PN:3/0)
⚠	Tracker 15 (PN:3/10)

Fig. B57

A symbol precedes each site name to indicate the alert status for the site:

- (check mark enclosed in green circle) indicates that all DTMACs at the site are operating normally
- (exclamation mark enclosed in yellow triangle) indicates a warning for possible errors in one or more controllers at the site
- (exclamation mark enclosed in red triangle) indicates that one or more controllers at the site have a system status error

**Note.** To filter the lists on the main page such that only sites with warnings and alerts are displayed, click the **Options** button above the site list, select the **Show only errors?** check box and click **Save changes** in the **Dashboard Options** window, and then click **Reload Page** in the confirmation window (refer to Section B.3.1).

To view the issue summary, mouse over the DTMAC unit name (Fig. B58).

The screenshot shows the TMAC™ Advanced Tracker Controller interface. At the top, there's a navigation bar with tabs for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. On the right side of the header, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the header, there's a sidebar with "Options" and "Search" buttons, and a list of units with alerts:

- **HQ TZ:-08:00**
- **Uncategorized units TZ:-08:00**
- **Elverta R&D TZ:-08:00**
- **Rancho California Water District TZ:-08:00**
- **QTP TZ:-08:00**
- **Montalto Centauro 9MWP TZ:+01:00**
- **Sandia Hammer TZ:-07:00**

The main area is titled "UNITS WITH PROBLEMS DURING THE LAST 24 HOURS:" and lists two entries:

- Rancho California Water District TZ:-08:00**
  - ⚠ 00:13:a2:00:40:66:0e:68 (M0531\_AREA01\_TRK04 PN:1/0)
  - ⚠ 00:13:a2:00:40:66:0d:6f (M0531\_AREA01\_TRK05 PN:1/9)
  - ⚠ 00:13:a2:00:40:66:0d:c5 (M0531\_AREA01\_TRK13 PN:1/1)
- Montalto Centauro 9MWP TZ:+01:00**
  - ⚠ Tracker 6 (PN:1/0)
  - ⚠ Tracker 4 (PN:1/4)

A tooltip is visible over the third alert under Rancho California Water District, stating: "Error: Motor not controlled: Not controlled (Reported 10 minutes ago)".

Fig. B58

To gather more information about the occurring (or persistent) alert, click the DTMAC unit name link to display the unit-level view (Fig. B59). View the unit information and use the different sections on the page to investigate the error, verify parameters, and perform troubleshooting by modifying settings or executing remote operational commands.

The **GRAPHS** section allows you to view graphical data based on selections of graph types and dates (Fig. B59). The default graph type is *Motor history*; select other graphs in the **Graph type** drop-down list. Use the slider to select a date or inclusive dates for which to view data. For more information, refer to Section B.3.5.

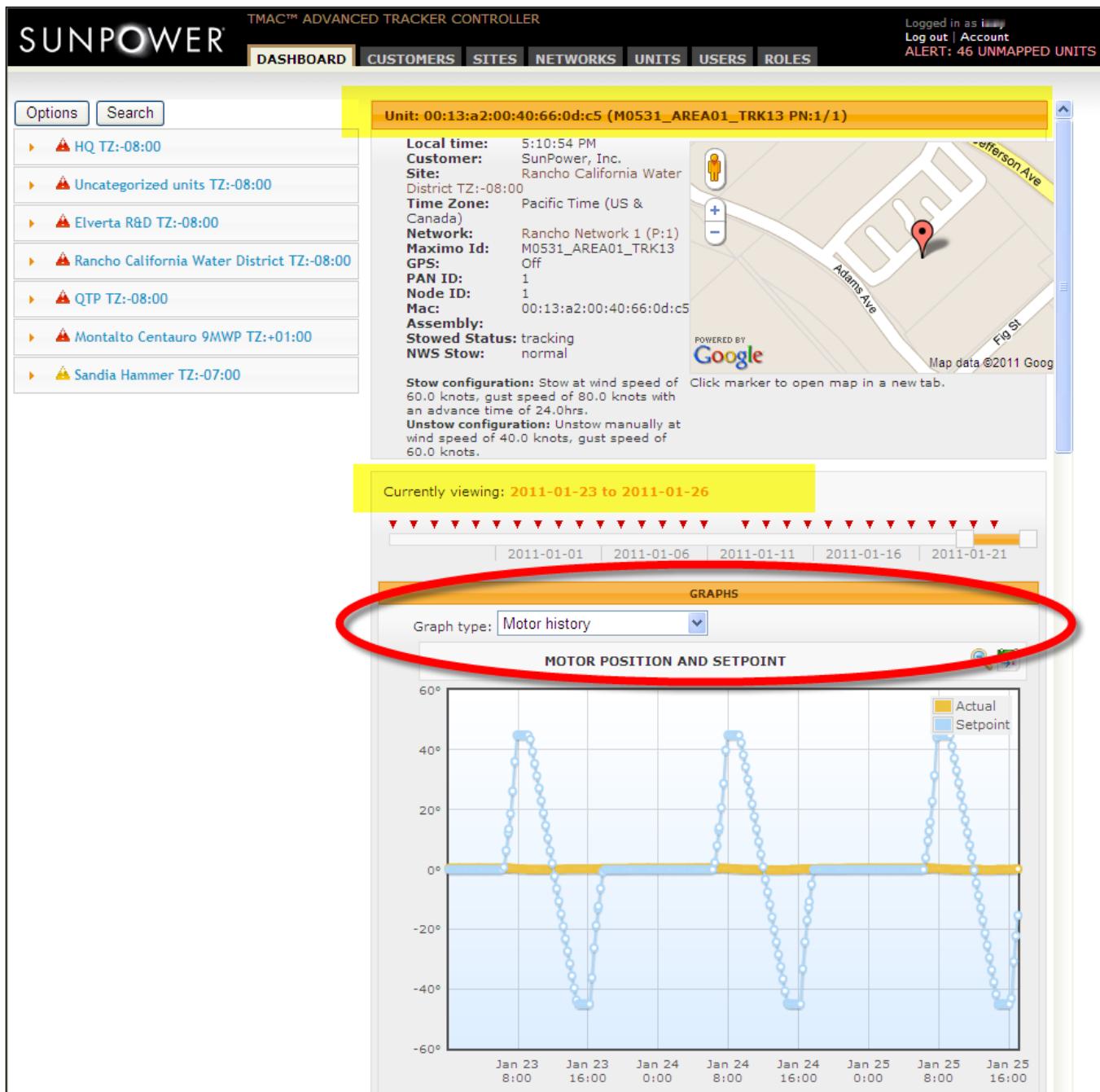


Fig. B59

The **SYSTEM STATUS** section lists system status indicators by message types. An alert symbol precedes each message type to indicate the alert status (Fig. B60). Refer to Section B.3.6 and Section B.3.12.

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. The DASHBOARD tab is selected. In the top right corner, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the navigation bar is a sidebar with "Options" and "Search" buttons, followed by a list of alerts:

- **⚠ HQ TZ:-08:00**
- **⚠ Uncategorized units TZ:-08:00**
- **⚠ Elverta R&D TZ:-08:00**
- **⚠ Rancho California Water District TZ:-08:00**
- **⚠ QTP TZ:-08:00**
- **⚠ Montalto Centauro 9MWP TZ:+01:00**
- **⚠ Sandia Hammer TZ:-07:00**

The main content area is titled "SYSTEM STATUS" and contains a table:

MESSAGE TYPE	LAST RECEIVED	NOTES
⚠ System status (101)	6 minutes ago	↳ Motors
✓ Inclinometer status (102)	6 minutes ago	↳
✓ Wireless1 status (103)	6 minutes ago	↳
✓ Wireless2 status (104)	6 minutes ago	↳
✓ Wireless3 status (105)	6 minutes ago	↳
✓ Operating system status (106)	6 minutes ago	↳
✓ GPS status (107)	6 minutes ago	↳
✓ A/D status (108)	6 minutes ago	↳
✓ DIO status (109)	6 minutes ago	↳
⚠ Motor status (110)	6 minutes ago	↳ Motor not controlled: Not controlled
✓ Settings1 status (114)	6 minutes ago	↳
✓ Settings2 status (115)	6 minutes ago	↳
✓ Server status (116)	6 minutes ago	↳
✓ Tracker status (117)	6 minutes ago	↳

**Fig. B60**

To view, verify, or add records of events for the DTMAC unit, use the **CONTROLLER EVENTS** section (Fig. B61). Use the (Expand) and (Collapse) buttons to display and hide details of each message type. Refer to Section B.3.7 and Section B.3.12.

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. The left sidebar is identical to Fig. B60. The main content area is titled "CONTROLLER EVENTS" and displays event details for a specific entry:

EVENT	LAST RECEIVED
STL o:100.0 m: 0.0 e: 2.0 a: 0.4 Subsystem: Motor Priority: Always Id: Stall Tag: 1	01-13-2011 06:23:41

Below the table, detailed information is shown for the event:

<b>Message type:</b> Event report	<b>Message:</b> STL o:100.0 m: 0.0 e: 2.0 a: 0.4
<b>Message number:</b> 1467610	<b>Priority:</b> Always (4)
<b>Time/date received:</b> 01-13-2011 06:24:15	<b>Subsystem:</b> Motor (Applies to the motor subsystem. 1)
<b>Time/date created:</b> 01-13-2011 06:23:41	<b>ID:</b> Stall (Motor shutdown on stall 2)
<b>Unit:</b> Mac: 00:13:a2:00:40:66:0d:c5	<b>Tag:</b> 1 (00000001)
<b>Customer:</b> SunPower, Inc.	
<b>Site:</b> Rancho California Water District	

At the bottom, three additional event entries are listed:

- New operation mode: JOG => AUTO Subsystem: Global Priority: Always Id: Mode\_change Tag: 1 01-11-2011 12:20:47
- New operation mode: AUTO => JOG Subsystem: Global Priority: Always Id: Mode\_change Tag: 3 01-11-2011 12:20:47
- New operation mode: JOG => AUTO Subsystem: Global Priority: Always Id: Mode\_change Tag: 1 01-11-2011 12:19:03

**Fig. B61**

## B.3.14 Creating, Editing, and Deleting Customer Information

Administrator users can create, edit, and delete customer profiles on the Customer page. Supervisor users can only edit customer information.

1. Click the **CUSTOMERS** tab to open the Customer page.
2. Create and manage customer profiles using links on the page.
  - To create new customer profiles:
    - a. Click **Create New**.
    - b. In the **Create Customer** window, enter the customer name and select an option for email reporting (Fig. B62).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there is a navigation bar with tabs: DASHBOARD, CUSTOMERS (which is highlighted in orange), SITES, NETWORKS, UNITS, USERS, and ROLES. On the right side of the header, it says "Logged in as [REDACTED]" and "ALERT: 46 UNMAPPED UNITS". Below the header, the main content area has a title "Customer" and a sub-section "Create Customer". There are three input fields: "Name" (empty), "Admin" (containing "tmac\_admin@sunpowercorp.com"), and "Email report" (containing "False"). At the bottom of the dialog are two buttons: "Create" and "Cancel". Below the dialog, there is a table header row with columns "Name", "Updated at", and "Sites".

Fig. B62

- c. Click *Create*.

- To edit customer profiles:
  - Locate the customer name in the list. If it is a big list, use the search function. Enter the customer name in the **Search Terms** field and click **Search**.
  - Click **Edit** under the rightmost column.
  - Enter or select values in the **Update [Customer name]** window (Fig. B63).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. The top navigation bar includes links for DASHBOARD, CUSTOMERS (which is highlighted in yellow), SITES, NETWORKS, UNITS, USERS, and ROLES. On the far right, it shows 'Logged in as [username]' and 'ALERT: 46 UNMAPPED UNITS'. Below the navigation is a table titled 'Customer' with columns for Name, Updated at, and Sites. A row for 'Update SunPower, Inc.' is selected and highlighted with a green border. The 'Sites' column for this row contains three input fields: 'Name' (SunPower, Inc.), 'Admin' (tmac\_admin@sunpowercorp.com), and 'Email report' (False). At the bottom of the dialog are 'Update' and 'Cancel' buttons.

Name	Updated at	Sites
Update SunPower, Inc.		<input type="text" value="SunPower, Inc."/> <input type="text" value="tmac_admin@sunpowercorp.com"/> <input type="text" value="False"/>

Fig. B63

- To edit customer profiles:
  - Locate the customer name in the list.
  - Click **Delete** under the rightmost column.
  - Click **OK** in the confirmation window (Fig. B64).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. The top navigation bar and alert message are identical to Fig. B63. The 'CUSTOMERS' table lists four entries: 'SunPower, Inc.', 'Uncategorized units', 'SunPower, Inc. (R&D)', and 'SunPower, Inc. (Don test)'. The 'Sites' column for each entry contains detailed information. The 'Actions' column on the right side of the table includes 'Edit', 'Delete', and 'Show' buttons. A 'Delete' button for the 'SunPower, Inc.' entry has been clicked, and a Windows Internet Explorer confirmation dialog box is overlaid on the page, asking 'Are you sure?' with 'OK' and 'Cancel' buttons.

Name	Updated at	Sites	Actions
SunPower, Inc.	Sat, 29 Aug 2009 00:00:11 +0000	Sonoma Water District TZ:-08:00, Rancho California Water District TZ:-08:00, Inland Empire RP-5 TZ:-08:00, ... (6)	<b>Edit</b> <b>Delete</b> <b>Show</b>
Uncategorized units	Wed, 28 Oct 2009 20:03:14 +0000	Uncat	<b>Edit</b> <b>Delete</b> <b>Show</b>
SunPower, Inc. (R&D)	Tue, 15 Dec 2009 04:19:31 +0000	HQ TZ	<b>Edit</b> <b>Delete</b> <b>Show</b>
SunPower, Inc. (Don test)	Tue, 13 Jul 2010 22:03:45 +0000	Mount	<b>Edit</b> <b>Delete</b> <b>Show</b>

Fig. B64

## B.3.15 Creating, Editing, and Deleting Site Information

Administrator users can create, edit, and delete site profiles on the Site page. Supervisor users can only edit site information.

1. Click the **SITES** tab to open the Site page.
2. Create and manage site profiles using links on the page.
  - To create a new site:
    - a. Click **Create New**.
    - b. In the **Create Site** window, enter and select site details as indicated in the project drawings (Fig. B65).

The screenshot shows the SunPower TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there is a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES (which is highlighted in yellow), NETWORKS, UNITS, USERS, and ROLES. On the right side of the header, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the header, there is a search bar with a magnifying glass icon and a "Create New" button with a plus sign. The main content area is titled "Site" and contains a "Create Site" form. The form fields include:

Name	<input type="text"/>
Customer	<input type="text"/> SunPower, Inc.
Latitude	<input type="text"/> 37.8805
Longitude	<input type="text"/> -122.264
Admin	<input type="text"/> tmac_admin@sunpowercorp.com
Enable email reporting?	<input type="select"/> False
Enable stow on NWS forecast?	<input type="select"/> True
Sustained wind forecast for stowing (knots)	<input type="text"/> 60.0
Gust forecast for stowing (knots)	<input type="text"/> 80.0
Hours of high wind forecast to monitor	<input type="text"/> 24.0
Enable automatic unstow after wind abates?	<input type="select"/> False
Sustained wind forecast that prevents unstow (knots)	<input type="text"/> 40.0
Gust forecast that prevents unstow (knots)	<input type="text"/> 60.0
Hours to remain stowed after wind forecast abates	<input type="text"/> 6.0
Time zone	<input type="text"/> (GMT-08:00) Pacific Time (US & Canada)

At the bottom of the dialog box, there are two buttons: "Create" (highlighted in yellow) and "Cancel".

Fig. B65

**Important!** The values in the **Create Site** window are not generic. Ensure that you carefully enter or select values as they are indicated in the project drawings.

- c. Click *Create*.

- To edit site profiles:
  - Locate the site profile using the search function. Enter the site name in the **Search Terms** field and click **Search**.
  - Click **Edit** under the rightmost column.
  - Enter or select values in the **Update [Site name]** window (Fig. B66).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as [\[username\]](#)  
[Log out](#) | [Account](#)  
**ALERT: 46 UNMAPPED UNITS**

**Site**

elverta R&D		<a href="#">Search</a>	<a href="#">Reset</a>							
Name	Address	Customer	Networks	Latitude	Longitude	Stow status	Stow configuration	Unstow configuration	Site setting	Time zone
(Filtered)										

**Update Elverta R&D TZ:-08:00**

Name	Elverta R&D
Customer	SunPower, Inc. (R&D)
Latitude	38.72890
Longitude	-121.47983
Admin	tmac_admin@sunpowercorp.com
Enable email reporting?	False
Enable stow on NWS forecast?	False
Sustained wind forecast for stowing (knots)	20
Gust forecast for stowing (knots)	30
Hours of high wind forecast to monitor	24
Enable automatic unstow after wind abates?	True
Sustained wind forecast that prevents unstow (knots)	15
Gust forecast that prevents unstow (knots)	25
Hours to remain stowed after wind forecast abates	6
Time zone	(GMT-08:00) Pacific Time (US & Canada)

[Update](#) [Cancel](#)

**Fig. B66**

d. Click *Update*.

- To delete site profiles:
  - Locate the site you want to edit or delete using the search function. Enter the site name in the **Search Terms** field and click **Search**.
  - Click **Delete** under the rightmost column.
  - Click **OK** in the confirmation window (Fig. B67).

The screenshot shows the TMAC™ Advanced Tracker Controller software interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES (which is highlighted in yellow), NETWORKS, UNITS, USERS, and ROLES. On the far right of the header, it says "Logged in as [username]" and has links for "Log out" and "Account". Below the header, a red alert box says "ALERT: 46 UNMAPPED UNITS". The main area is titled "Site" and has a search bar containing "elverta R&D". Below the search bar are two buttons: "Search" and "Reset". The main content is a table with the following columns: Name, Address, Customer, Networks, Latitude, Longitude, Stow status, Stow configuration, Unstow configuration, Site setting, and Time zone. One row in the table is selected, showing the following details: Elverta R&D, SunPower, Inc. (R&D), Hammer network (P:1), 38.7289, -121.47983, Stow site, Stowing is disabled., Unstowing is disabled., Create New, Pacific Time (US & Canada). To the right of the table, there are three buttons: "Edit", "Delete" (which is highlighted with a yellow box and has a mouse cursor pointing to it), and "Show". Below the table, a message says "1 Found". A Windows Internet Explorer confirmation dialog box is overlaid on the bottom left, asking "Are you sure?" with "OK" and "Cancel" buttons.

Fig. B67

## B.3.16 Creating, Editing, and Deleting Network Information

Administrator users can create, edit, and delete network profiles on the Network page.

1. Click the **NETWORKS** tab to open the Network page.
2. Create and manage network profiles using links on the page.
  - To create a new network or networks for a site:
    - a. Click **Create New** in the upper right of the page.
    - b. In the **Create Network** window, enter and select network details as indicated in the project drawings (Fig. B68).

The screenshot shows the SUNPOWER TMAC™ ADVANCED TRACKER CONTROLLER software interface. At the top, there is a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS (which is highlighted in yellow), UNITS, USERS, and ROLES. On the far right of the header, it says "Logged in as [username]" and "Log out | Account". Below the header, there is a message "ALERT: 46 UNMAPPED UNITS". The main area is titled "Network" and contains a sub-section titled "Create Network". This dialog box has several input fields: "Name" (containing "-1"), "Site" (containing "Sonoma Water District TZ:-08:00"), and "Coordinator Host", "Coordinator Port", "Coordinator Login", and "Coordinator Password" (all of which are empty). At the bottom of the dialog box are two buttons: "Create" (highlighted in yellow) and "Cancel".

Fig. B68

**Important!** The values in the **Create Network** window are not generic. Ensure that you carefully enter or select values as they are indicated in the project drawings.

- c. Click **Create**.
- To edit network profiles:
  - a. Locate the network profile using the search function. Enter the network name in the **Search Terms** field and click **Search**.
  - b. Click **Edit** under the rightmost column.
  - c. Enter or select values in the **Update [Network name]** window (Fig. B69).

SUNPOWER

TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as [REDACTED]  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

**Network**

**Sonoma Network 1** Search Create New

Site	Name	Pan	Units	Coordinator info
(Filtered)				

**Update Sonoma Network 1 (P:1)**

Name	Sonoma Network 1
Pan	1
Site	Sonoma Water District TZ:-08:00
Coordinator Host	
Coordinator Port	
Coordinator Login	
Coordinator Password	

**Update** **Cancel**

1 Found

Fig. B69

- d. Click **Update**.
- To delete network profiles:
  - a. Locate the network profile using the search function. Enter the network name in the **Search Terms** field and click **Search**.
  - b. Click **Delete** under the rightmost column.
  - c. Click **OK** in the confirmation window (Fig. B70).

SUNPOWER

TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as [REDACTED]  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

**Network**

**QTP Network 2** Search Create New

Site	Name	Pan	Units	Coordinator info
(Filtered)				
QTP TZ:-08:00	QTP Network 2	2	2.0 (PN:2/0), 2.1 (PN:2/1), 2.3 (PN:2/3), ... (6)	<b>Edit</b> <b>Delete</b> <b>Show</b>

1 Found

**Windows Internet Explorer**

Are you sure?

**OK** **Cancel**

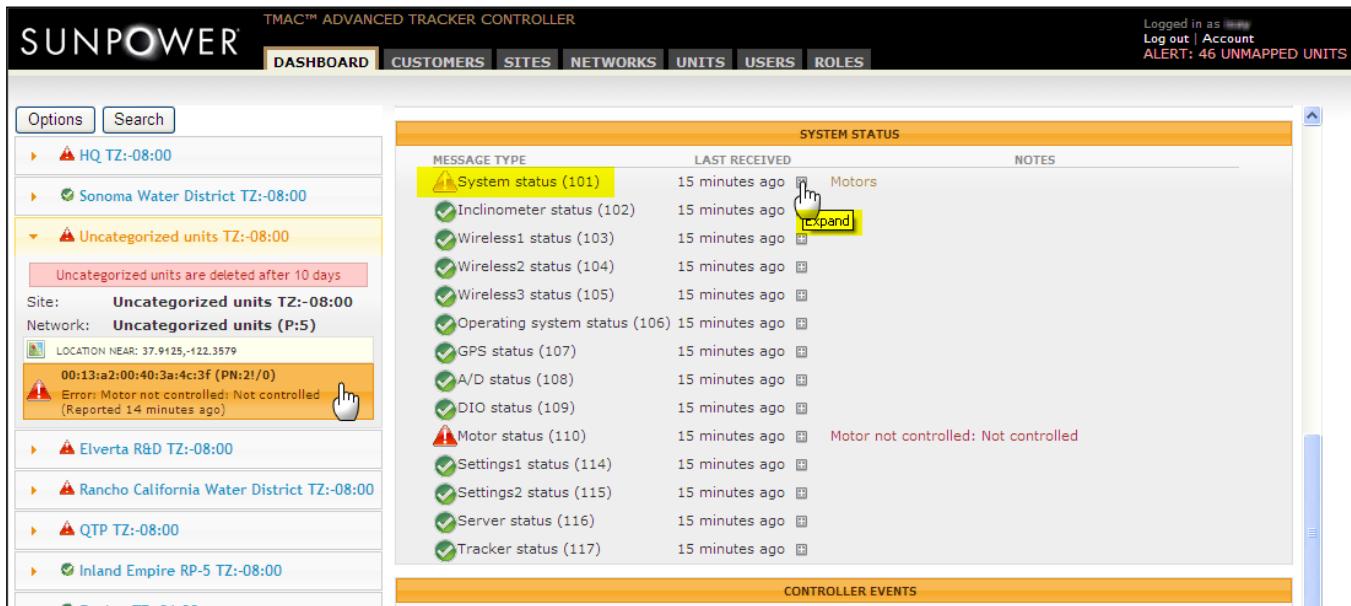
Fig. B70

## B.3.17 Assigning DTMAC Units

New controllers show up in the **Uncategorized units TZ:-08:00** item in the site list on the main or **DASHBOARD** tab page. The new DTMACs are grouped together according to their GPS location to differentiate the controllers when multiple sites come online or communicate to the server.

**Note.** Only administrator and supervisor users can administer new DTMAC units.

1. On the main or **DASHBOARD** tab page, click *Uncategorized units TZ:-08:00* in the site list.
2. In the expanded pane, click the DTMAC unit link you want to assign to a site or network, or both.
3. The unit-level view is displayed on the page. Scroll down to the **SYSTEM STATUS** section and click the  (Expand) button for *System status (101)* (Fig. B71).



The screenshot shows the TMAC™ Advanced Tracker Controller interface. The top navigation bar includes links for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS, USERS, and ROLES. A message in the top right corner states "ALERT: 46 UNMAPPED UNITS". The left sidebar lists various sites and networks, with "Uncategorized units TZ:-08:00" currently selected. A message box indicates "Uncategorized units are deleted after 10 days". Below this, site and network details are shown: Site: Uncategorized units TZ:-08:00 and Network: Uncategorized units (P:5). A location near 37.9125,-122.3579 is listed with a coordinate icon. An error message "Error: Motor not controlled: Not controlled (Reported 14 minutes ago)" is highlighted with a yellow background and a cursor icon pointing to it. The main content area is titled "SYSTEM STATUS" and displays a table of messages. The table has columns for MESSAGE TYPE, LAST RECEIVED, and NOTES. The first message, "System status (101)", is highlighted with a yellow background and has an "Expand" button next to its NOTES column, which is also highlighted with a yellow background. Other messages listed include Inclinometer status (102), Wireless1 status (103), Wireless2 status (104), Wireless3 status (105), Operating system status (106), GPS status (107), A/D status (108), DIO status (109), Motor status (110), Settings1 status (114), Settings2 status (115), Server status (116), and Tracker status (117). All messages were received 15 minutes ago. The bottom of the screen shows a "CONTROLLER EVENTS" section.

Fig. B71

4. Locate and take note of the **NodeID inputs** and **PanID inputs** values (Fig. B72).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as [REDACTED]  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

DASHBOARD CUSTOMERS SITES NETWORKS UNITS USERS ROLES

Options Search

HQ TZ:-08:00

Sonoma Water District TZ:-08:00

Uncategorized units TZ:-08:00

Uncategorized units are deleted after 10 days

Site: Uncategorized units TZ:-08:00  
Network: Uncategorized units (P:5)

LOCATION NEAR: 37.9125,-122.3579  
00:13:a2:00:40:3a:4c:3f (PN:21/0)  
Error: Motor not controlled: Not controlled (Reported 14 minutes ago)

Elvera R&D TZ:-08:00

Rancho California Water District TZ:-08:00

QTP TZ:-08:00

Inland Empire RP-5 TZ:-08:00

Exelon TZ:-06:00

Montalto Centauro 9MWP TZ:+01:00

Sandia Hammer TZ:-07:00

SYSTEM STATUS

MESSAGE TYPE LAST RECEIVED NOTES

System status (101) 15 minutes ago Motors

Message type:	System status	Time since boot (seconds):	3094360
Message number:	48552	Time since boot (D:H:M:S):	Days:35, Hours:19, Minutes:32, Seconds:40
Time/date received:	01-28-2011 07:07:56	Unit booted at:	12-23-2010 11:34:32
Time/date created:	01-28-2011 07:07:12	Valid settings:	Time Location
Unit	Mac: 00:13:a2:00:40:3a:4c:3f	INVALID settings:	All settings valid
Customer:	Uncategorized units	Stow (this TMAC):	NO
Site:	Uncategorized units	NWS stow:	NO
		Stow (entire site):	NO
		Nighttime request (this TMAC):	NO
		Nighttime request (entire site):	NO
		Force version:	3797
		Force mask:	000
		Working:	0111111111111111111111111111111011111111
		Subsystem not working:	Motors
		Digital inputs:	0100000000000000000011110000000000000010
		NodeID inputs:	0
		PanID inputs:	2
		GP digital inputs:	11110000
		Digital outputs:	00000000
		Motor 1 ...	0.0625

Fig. B72

5. Scroll down the page to the **REMOTE UPDATES** section and click *Administer unit* (Fig. B73).

**SUNPOWER** TMAC™ ADVANCED TRACKER CONTROLLER

Logged in as [REDACTED]  
Log out | Account  
ALERT: 46 UNMAPPED UNITS

DASHBOARD CUSTOMERS SITES NETWORKS UNITS USERS ROLES

Options Search

HQ TZ:-08:00

Sonoma Water District TZ:-08:00

Uncategorized units TZ:-08:00

Uncategorized units are deleted after 10 days

Site: Uncategorized units TZ:-08:00  
Network: Uncategorized units (P:5)

LOCATION NEAR: 37.9125,-122.3579  
00:13:a2:00:40:3a:4c:3f (PN:21/0)  
Error: Motor not controlled: Not controlled (Reported 14 minutes ago)

Elvera R&D TZ:-08:00

Rancho California Water District TZ:-08:00

REMOTE UPDATES

Change the commissioning parameters for a TMAC. THIS WILL CHANGE THE BEHAVIOR OF ALL TRACKERS. If you make changes here, the TMAC will download the changes the next time it checks for updates, typically within 5 minutes. Perform administration tasks for this TMAC, for instance move this unit to another network.

MOVE ALL UNITS AT THIS SITE:  
STOW NIGHT

Set nighttime angle

You can slow or move to the nighttime position, all the trackers at this site. The operation will happen the next time a tracker checks for updates.

Set the nighttime angle for all units at this site.

RECENT UPDATES

Unit's Current Version: 3797  
v3797 by system user

- Longitude changed from -122.3579 to -122.358
- Latitude changed from 37.9124 to 37.9125
- Longitude changed from -122.358 to -122.3579

01-28-2011 07:01:40 01-28-2011 06:01:32

Fig. B73

6. The **EDIT FOR UNIT [DTMAC UNIT]** screen appears (Fig. B74).

The screenshot shows the SUNPOWER TMAC Advanced Tracker Controller interface. The top navigation bar includes 'DASHBOARD', 'CUSTOMERS', 'SITES', 'NETWORKS', 'UNITS', 'USERS', and 'ROLES'. A message in the top right corner says 'Logged in as Isay' and 'ALERT: 46 UNMAPPED UNITS'. The left sidebar lists various sites and units, with 'Uncategorized units TZ:-08:00' expanded to show details like location and error messages. The main content area is titled 'REMOTE UPDATES' and contains the 'EDIT FOR UNIT' dialog box. The dialog box fields include:

Field	Value	Last Modified
Name		01-28-2011 07:01:40
Maximo Id		01-28-2011 06:01:32
Description	original pan_id=2	01-28-2011 05:01:13
Access Key		01-28-2011 04:01:56
Admin	tmac_admin@sunpowercorp.com	01-28-2011 03:01:43
Email report	false	01-28-2011 02:01:43
Has GPS	true	
Mac	00:13:a2:00:40:3a:4c:3f	
Node id	0	
Assembly	<input type="button" value="▼"/>	
Select the unit's location:		
Customer	Uncategorized units	
Site	Uncategorized units TZ:-08:00	
Network	Uncategorized units (P:5)	

At the bottom of the dialog box are 'Save changes' and 'Cancel' buttons.

Fig. B74

7. Referring to the project drawings, enter or select values in the fields.

<b>Name</b>	Enter the DTMAC name.
<b>Maximo Id</b>	Enter the Maximo ID in this format: MXXX_AREAXX_TRKXX <ul style="list-style-type: none"><li>• The MXXX value is the project number</li><li>• The AREAXX value is the location number</li><li>• The TRKXX value is the tracker number</li></ul>
<b>Description</b>	Enter the description for the DTMAC.
<b>Access Key</b>	Enter the access key.
<b>Admin</b>	Enter the email address of the authorized administrator.
<b>Email report</b>	Select option to indicate agreement between O&M and the customer for email reporting.
<b>Has GPS</b>	Select option to indicate if a GPS unit is installed in the DTMAC.
<b>Mac</b>	Enter the Mac address.
<b>Node id</b>	Enter the Node ID as indicated in the <i>System status (101)</i> details.
<b>Assembly</b>	Select option for assembly.
<b>Customer</b>	Select the customer name in the drop-down list.
<b>Site</b>	Select the site name in the drop-down list.
<b>Network</b>	Select the network name in the drop-down list.

8. Click *Save changes*.

## B.3.18 Editing and Deleting DTMAC Unit Information

Administrator users can edit or delete DTMAC unit information using the **UNITS** tab. Supervisor users can only edit DTMAC unit information.

1. Click the **UNITS** tab to open the Unit page.
2. Manage DTMAC unit profiles using links on the page.
  - To edit a DTMAC unit profile:
    - a. Locate the DTMAC unit using the search function. Enter the DTMAC unit name, Maximo ID, or Mac address in the **Search Terms** field and click **Search**.
    - b. Click **Edit** under the rightmost column.
    - c. Enter or select values in the **EDIT FOR UNIT [UNIT NAME]** window (Fig. B75).

The screenshot shows the TMAC™ ADVANCED TRACKER CONTROLLER interface. At the top, there's a navigation bar with tabs: DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS (which is highlighted in orange), USERS, and ROLES. On the far right, it says "Logged in as [username]" and "ALERT: 46 UNMAPPED UNITS". Below the navigation bar, there's a search bar with the placeholder "Search Terms" and a "Search" button. To the right of the search bar are "Create New" and "Maximo Mapping" buttons. The main area is titled "Unit" and has a sub-section titled "M0726\_A1\_TRK1-2". Below this, there's a table header with columns: Name, Maximo, Mac, Network, Description, Nodeid, Force, and Assembly name. Under the "Network" column, it says "(Filtered)". A modal dialog box is open, titled "EDIT FOR UNIT TRACKER 1.2 (M0726\_A1\_TRK1-2 PN:1/0)". This dialog contains various input fields for editing the unit: Name (Tracker 1.2), Maximo Id (M0726\_A1\_TRK1-2), Network (Exelon Network 1 (P:1)), Description (original pan\_id=2), Access Key (empty), Admin (tmac\_admin@sunpowercorp.com), Email report (false), Has GPS (false), Mac (00:13:a2:00:40:54:f7:a3), and Node id (0). At the bottom of the dialog is a "Save changes" button. The status bar at the bottom of the dialog says "1 Found".

Fig. B75

- To delete a DTMAC unit profile:
  - Locate the DTMAC unit using the search function. Enter the DTMAC unit name, Maximo ID, or Mac address in the **Search Terms** field and click **Search**.
  - Click **Delete** under the rightmost column.
  - Click **OK** in the confirmation window (Fig. B76).

The screenshot shows the TMAC™ Advanced Tracker Controller web application. At the top, there's a navigation bar with links for DASHBOARD, CUSTOMERS, SITES, NETWORKS, UNITS (which is highlighted in yellow), USERS, and ROLES. A message in the top right corner says "ALERT: 46 UNMAPPED UNITS". Below the navigation, there's a search bar with the placeholder "Search" and buttons for "Create New" and "Maximo Mapping".

The main area is titled "Unit" and contains a table with columns: Name, Maximo, Mac, Network, Description, Nodeid, Force, and Assembly name. A row is selected, highlighted with a yellow background, showing the values: Tracker 1.2, M0726\_A1\_TRK1-2, 00:13:a2:00:40:54:f7:a3, Exelon Network 1 (P:1), original pan\_id=2, 0, version 123. To the right of the table are buttons for Updates, Messages, Edit, Delete, and Show, with a hand cursor pointing over the Delete button.

A message "1 Found" is displayed below the table. Overlaid on the bottom left is a Windows Internet Explorer confirmation dialog box with the title "Windows Internet Explorer". It asks "Are you sure?" and has "OK" and "Cancel" buttons. The entire screenshot is framed by a thick black border.

Fig. B76