

SolarTrak™ STNetPCI

SolarTrak Network PC Interface

Instructions

Required Accessories

You will need a DB-9 serial cable; male on one end and female on the other...

You may also need a USB-DB-9 serial converter like the one found at this link by CoolGear:

<http://www.coolgear.com/product/mini-usb-rs-232-serial-adapter-db-9-male>

There are others available but some don't work with this program for some reason.

Install Software

Win 7/10:

- <http://www.ni.com/download/labview-run-time-engine-2011-sp1/2896/en/>
- <http://www.ni.com/download/ni-visa-run-time-engine-5.4/4231/en/>
- [LabVIEW-based SolarTrak Network PC Interface Win 7/10 \(16 MB\)](#)

Win XP:

- <http://www.ni.com/download/labview-run-time-engine-8.2/679/en/>
- <http://www.ni.com/download/ni-visa-run-time-engine-4.2/832/en/>
- [LabVIEW-based SolarTrak Network PC Interface Win XP \(17 MB\)](#)
- Download and install both runtime components
- Download and unzip PC Interface software into 'My Documents' (creates folder)

Click STNet.exe to start

Choose or Enter Path of File

Save in: Config Files

- STConfig.ini
- STFurnace.i
- STHouwelin
- STLARE.ini
- STProspect
- STStandar
- STTest.ini

**This folder is in
C:\My Documents\STNet Network Interface Panel
Then Click OK**

File name:

STConfig

OK

Save as type:

Custom Pattern (*.ini)

Cancel

Field L

Oper

Cal

18:3

2/22

Next

Open

Sale

5 15

Clock

py

11

46

Time

Radio Buttons for Operational Mode Selection

Temp (F) 93.2

W/SMph 0.0

Battery VDC 30.2

Tgl J/S

Stow

ON

Operation

Calibration

Configuration

Diagnostics

HELP

Header 1

0

Date

Time

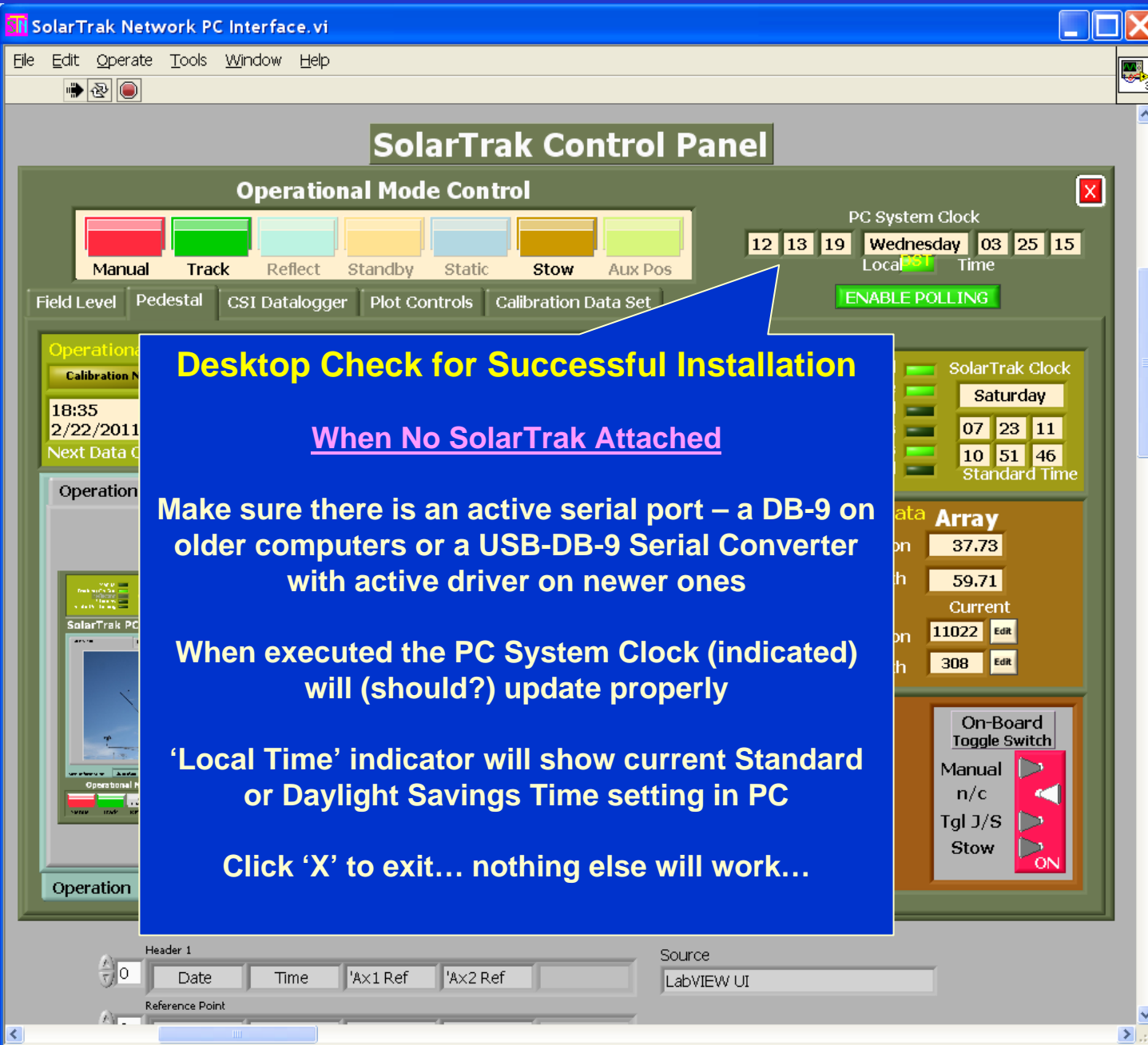
'Ax1 Ref

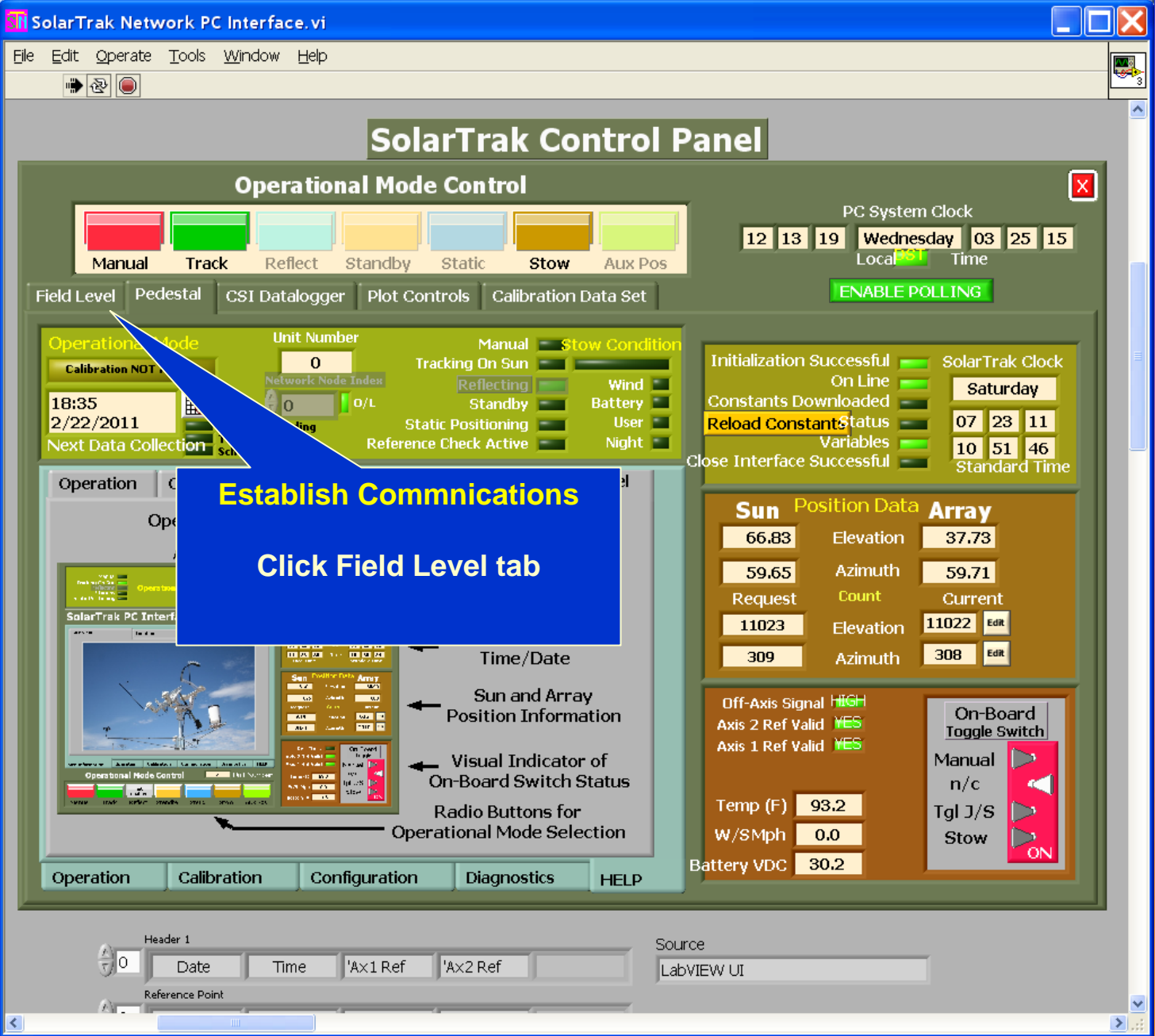
'Ax2 Ref

Source

LabVIEW UI

Reference Point





SolarTrak Control Panel

Operational Mode Control

Manual Track Reflect Standby Static Stow Aux Pos

PC System Clock
12 13 19 Wednesday 03 25 15
Local Time

Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set

ENABLE POLLING

Operational Mode Unit Number Manual Stow Condition
Calibration NOT... Tracking On Sun
18:35 Network Node Index Reflecting Wind
2/22/2011 0 D/L Battery
Next Data Collection Static Positioning User
Reference Check Active Night

Initialization Successful SolarTrak Clock
On Line Saturday
Constants Downloaded
Reload Constants Status 07 23 11
Variables 10 51 46
Close Interface Successful Standard Time

Establish Communications
Click Field Level tab

Sun	Position Data	Array
66.83	Elevation	37.73
59.65	Azimuth	59.71
Request	Count	Current
11023	Elevation	11022 Edit
309	Azimuth	308 Edit

Off-Axis Signal HIGH
Axis 2 Ref Valid YES
Axis 1 Ref Valid YES

On-Board Toggle Switch
Manual n/c
Tgl J/S
Stow ON

Temp (F) 93.2
W/SMph 0.0
Battery VDC 30.2

Operation Calibration Configuration Diagnostics HELP

Time/Date
Sun and Array Position Information
Visual Indicator of On-Board Switch Status
Radio Buttons for Operational Mode Selection

Header 1
0 Date Time 'Ax1 Ref 'Ax2 Ref
Reference Point

Source
LabVIEW UI

SolarTrak Control Panel

Operational Mode Control

Manual Track Reflect Standby Static Stow Aux Pos

PC System Clock
12 16 14 Wednesday 03 25 15
Local Time

Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set

ENABLE POLLING

Site View Set Time/Date Field Configuration Diagnostics



Click Field Configuration tab

Node Status

SEL	Node	O/L	H	M	S	T	R	S	M	E	N	O/TU/A
0	0	0	0	0	0	0	0	0	0	0	0	0

Header 1
0 Date Time 'Ax1 Ref' 'Ax2 Ref'

Reference Point

Source
LabVIEW UI

SolarTrak Control Panel

Operational Mode Control

Manual Track Reflect Standby Static Stow Aux Pos

PC System Clock

17 44 14 Wednesday 03 25 15
Local Time

Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set

ENABLE POLLING

Site View Set Time/Date Field Configuration Diagnostics

SolarTrak I/O Stream ASRL7::INSTR

If Network,
Look for Unit Number

2

Port Count Scan Comm Port Comm Scan Active Scanning Comm Port

0

Pick Comm Port

COM1

Reconnect Comm

Make sure serial cable is connected to the SolarTrak Then click the Blue button

Communications Network Addressing Site Definition

Save PCI Configuration Data to Disk

Header 1

0 Date Time 'Ax1 Ref 'Ax2 Ref

Source

LabVIEW UI

Reference Point

SolarTrak Control Panel

Operational Mode Control

Manual Track Refl

2. After 'Reconnect Successful'
Click 'Set Time/Date'

PC System Clock
11 Wednesday 03 25 15
Local Time
ENABLE POLLING

Field Level Pedestal CSI Data

Site View Set Time/Date Field Configuration Diagnostics

1. You should get this indication
that contact was made

SolarTrak I/O Stream ASRL19::INSTR

If Network, Look for Unit Number 2

Port Count/Scale 13

Pick Comm Port ASRL19: Reconnect Comm Error Reconnect Successful

Communications Network Addressing Site Definition

Save PCI Configuration Data to Disk

Node Status

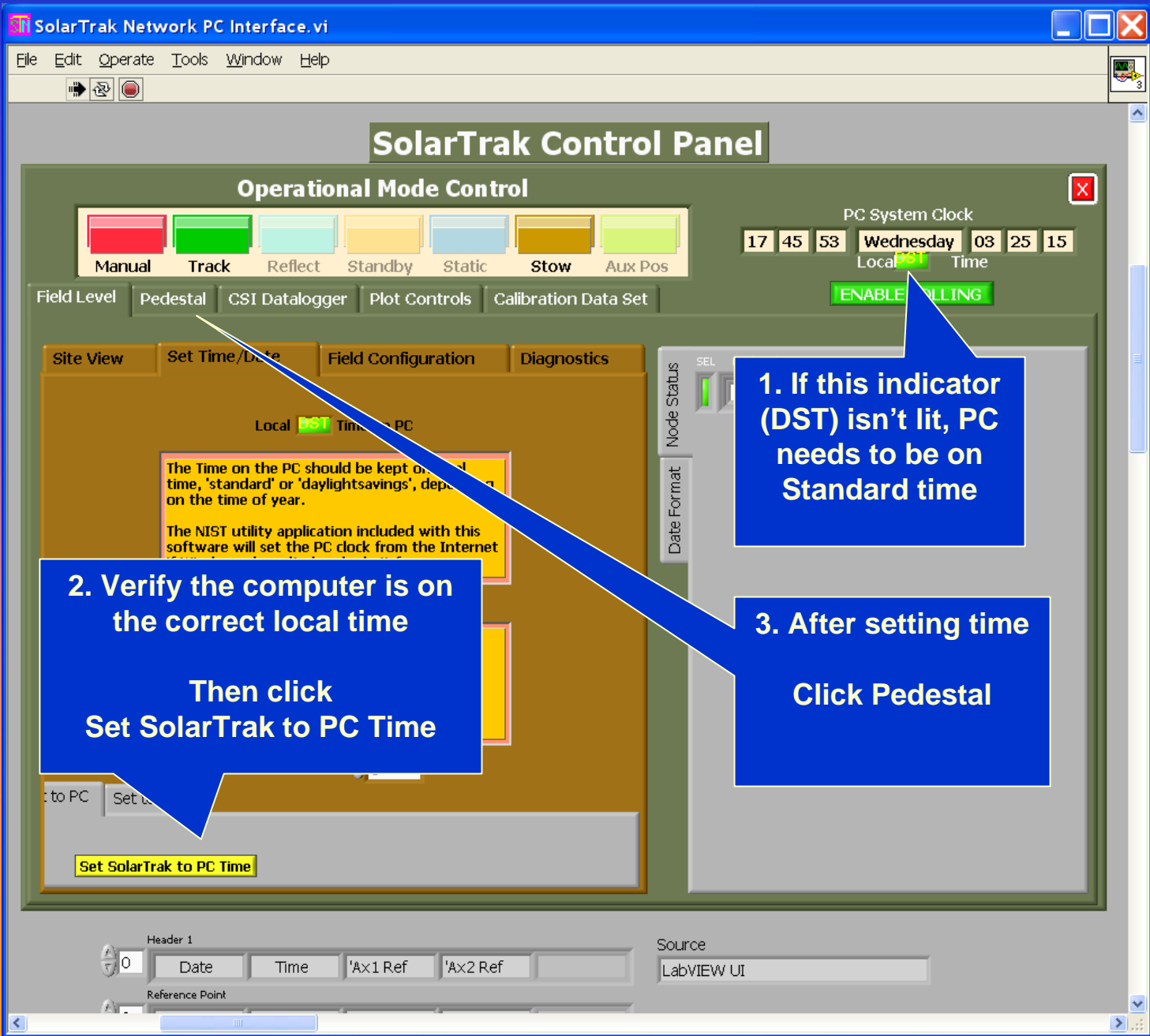
SEL	Node	O/L	H	M	S	T	R	S	M	E	N	O/TU/A
0	0	0	0	0	0	0	0	0	0	0	0	0

Header 1

0	Date	Time	'Ax1 Ref	'Ax2 Ref
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Reference Point

Source LabVIEW UI



1. If this indicator (DST) isn't lit, PC needs to be on Standard time

2. Verify the computer is on the correct local time
Then click Set SolarTrak to PC Time

3. After setting time
Click Pedestal

SolarTrak Control Panel

Operational Mode Control

Manual Track Reflect Standby Static Stow Aux Pos

PC System Clock
 17 47 48 Wednesday 03 25 15
 Local Time

ENABLE POLLING

Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set

Operational Mode

Calibration NOT Active
 18:35
 2/22/2011
 Next Data Collection
 Schedule Take Data Schedule

Enable Polling Function to Update Screen Information
Click Enable Polling

PC System Clock
 Saturday
 07 23 11
 10 51 46
 Standard Time

Operation Calibration

Operational Mode Information

- Program Execution Status and Control
- PC and SolarTrak Time/Date
- Sun and Array Position Information
- Visual Indicator of On-Board Switch Status
- Radio Buttons for Operational Mode Selection

Sun Position Data Array

66.83	Elevation	37.73
59.65	Azimuth	59.71
Request	Count	Current
11023	Elevation	11022 Edit
309	Azimuth	308 Edit

Off-Axis Signal HIGH
 Axis 2 Ref Valid YES
 Axis 1 Ref Valid YES

On-Board Toggle Switch

Manual n/c
 Tgl J/S
 Stow ON

Temp (F) 93.2
 W/SMph 0.0
 Battery VDC 30.2

Operation Calibration Configuration Diagnostics HELP

Header 1
 0 Date Time 'Ax1 Ref 'Ax2 Ref
 Reference Point

Source
 LabVIEW UI

SolarTrak Control Panel

Operational Mode Control

Manual Track Reflect Standby Static Stow Aux Pos

PC System Clock
 17 49 40 Wednesday 03 25 15
 Local Time

Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set

DISABLE POLLING

Operational Mode Unit Number 2 Manual **Stow Condition**
 Calibration NOT Active Tracking On Sun
 Network Node Index 0 Reflecting Wind
 Standby Battery
 Static Positioning User
 Night

Initialization Successful
 On Line
 Constants Downloaded
 Reload Constants Status
 Variables
 Interface Successful

SolarTrak Clock
 Wednesday
 03 25 15
 16 49 40
 Standard Time

**1. Verify that Constants Download
 And clock is indicating correct SOLAR time**

2. Verify that the 'Status' and 'Variables' lights begin alternating every few seconds

Axis 1 Coast Counts 0 Width-Spacng Ratio 0.65 Joy1N 10
 Axis 1 Switch ON 1 Full Deadband Mode ON Joy2P 20
 Axis 2 Deadband 3
 Axis 2 Coast Counts 0
 Axis 2 Switch ON 1

Sun Position Array
 -0.00 on 90.00
 -0.00 uth 49.24
 Request Current
 at -1 Edit
 at 255 Edit

Temp (F) 68.0
 W/SMph 0.0
 Battery VDC 10.6

On-Board Toggle Switch
 Manual n/c
 Tgl J/S
 Stow ON

Geometry Drive Parameters Location Misc Parameters

Operation Calibration Configuration Diagnostics HELP

Header 1
 0 Date Time 'Ax1 Ref' 'Ax2 Ref' Source LabVIEW UI
 Reference Point

Parameter Template Operations

There are myriad tracking and system control configurations supported by the SolarTrak control technology. There are many settable values stored within the MCU computer chip that if slightly wrong, can produce improper operation.

When configuring and calibrating a new tracking control system, it may very well be necessary to set each one individually, and sometimes over and over, in order to accomplish the task, but once done, the entire parameter block can be copied and saved on disk or recovered from a disk file and uploaded to a SolarTrak MCU as a unit, without setting each individual parameter every time.

When storing individual parameters or changing operational values like an Angle-of-Incidence offset, the polling function should be enabled to allow updating the values after the change. Typically, the PC Interface places the controller in Manual Mode while it changes a parameter, then puts the controller back in whatever mode it had been in prior to the setting change.

The necessary efficiencies of field maintenance can require the replacement of electrical components that have failed, hopefully not the SolarTrak itself, but it is usually easier to replace an entire control box than to replace a solid state relay in the field.

The use of parameter template transfer makes this rather straight forward. In preparation to utilize the PC interface in this manner, templates should be downloaded from all active controllers and stored on disk as a data base.

When a controller must be replaced, temporarily power up the replacement and upload the appropriate template file for that unit before going into the field.

As a note though, in general, the SolarTrak MCU chip, containing all these parameters, is not damaged by any electrical incident that may occur, and can usually be removed from the old board and inserted in the new board without the need for all this computer stuff.

The following frames indicate first downloading and saving templates then retrieving and uploading them to the controllers. Polling should be disabled during this process to reduce communication complexity.

Download Parameter Template

The screenshot displays the SolarTrak Network PC Interface.vi software. The main window is titled "SolarTrak Control Panel" and contains several sections:

- Operational Mode Control:** Includes a menu (File, Edit, View, Project, Operate, Tools, Window, Help), a status bar with icons, and a "Shopping Days 'Til Christmas" indicator showing 84 days. The PC System Clock shows 12:00:15 on Sunday, 10/01/17. A green "ENABLE POLLING" button is visible.
- Operational Mode:** Shows "Unit Number" 22, "Manual" status, "Tracking On Sun" (Reflecting), and "Wind" status. A "Stow Condition" indicator is present.
- Operational Parameters:** A "Template File" section with a "Transfer Progress" bar. The "Download Template from CPU" button is highlighted in green. Other buttons include "Upload Template to CPU", "Get Template File from...", and "Save Template File...".
- Sun Position Data Array:** A table showing Sun position data:

Sun	Position Data	Array
17.23	Elevation	Inf
-20.51	Azimuth	0.00
Request	Count	Current
-1	Elevation	-1
-1	Azimuth	-1
- On-Board Toggle Switch:** A manual control section with "Manual n/c", "Tgl J/S", and "Stow" indicators, and a red "ON" button.

Three blue callout boxes provide instructions:

1. Verify that polling is Disabled after verifying good communications
2. Click – Download Template from CPU
3. The On Line light should remain green throughout this process and the Done light comes on when finished

The bottom of the window shows a navigation bar with "Operation", "Calibration", "Configuration", "Diagnostics", and "HELP" tabs, and a "Battery VDC" indicator showing 10.7.

Save Parameter Template

The screenshot shows the SolarTrak Network PC Interface software. In the background, the 'Operational Mode Control' panel has a 'File-Template Control' section with a 'Save Template File to Disk' button highlighted. A blue callout box with the text '1. Click – Save Template File to Disk' points to this button.

In the foreground, a 'Choose or Enter Path of File' dialog box is open. The 'Save in:' field is set to 'SolarTrak Network PC Interface Files'. The file list shows folders for 'Calibration Data', 'Config Files', 'EXE', 'JPEGs', and 'Template Files'. The 'Template Files' folder is selected, and a tooltip shows its size as 22.6 KB and lists files: 'AJS-1.TPL', 'EMC1.TPL', 'FLIP-2.tpl', 'HN-02.TPL', 'HN-03.TPL', ... A blue callout box with the text '2. Navigate to 'Template Files' and save using an appropriate name... the extension 'TPL' is appended for you' points to the 'Template Files' folder.

The dialog box also shows a 'File name:' field, a 'Save as type:' dropdown set to 'Custom Pattern (*.tpl)', and 'Open' and 'Cancel' buttons.

Retrieve and Upload Parameter Template

SolarTrak Network PC Interface.vi

File Edit View Project Operate Tools Window Help

SolarTrak Control Panel

Operational Mode Control

Manual Track Reflect Standby Static Stow Aux Pos

Shopping Days 'Til Christmas 84

PC System Clock 12 00 15 Sunday 10 01 17

Local Time

ENABLE POLLING

Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set

Operational Mode Unit Number 22 Manual Stow Condition

Calibration NOT Active

18:35 2/22/2011

Next Data Collection

Schedule Pending Take Data Schedule Expired

Tracking On Sun Reflecting Standby Static Positioning Reference Check Active

Wind Battery User Night

Initialization Successful On Line Constants Downloaded Reload Constants Status Variables Close Interface Successful

SolarTrak Clock Sunday 10 01 17 10 59 50 Standard Time

Operational Parameters Template File

Manual ON

Start File-Template Control Done Transfer Progress

Download Template from CPU D014

Upload Template to CPU B7FE

Get Template File from Disk

Save Template File to Disk

2. Click - Upload Template to CPU Done light comes on when finished

1. Click - Get Template File from Disk

Sun Position Data Array

17.23 Elevation Inf

-20.51 Azimuth 0.00

Request Count Current

Axis 2 Ref Valid YES

Axis 1 Ref Valid NO

Temp (F) 68.0

W/SMph 0.0

Battery VDC 10.7

Manual n/c

Tgl J/S

Stow ON

Operation Calibration Configuration Diagnostics HELP

My Computer