# 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:**

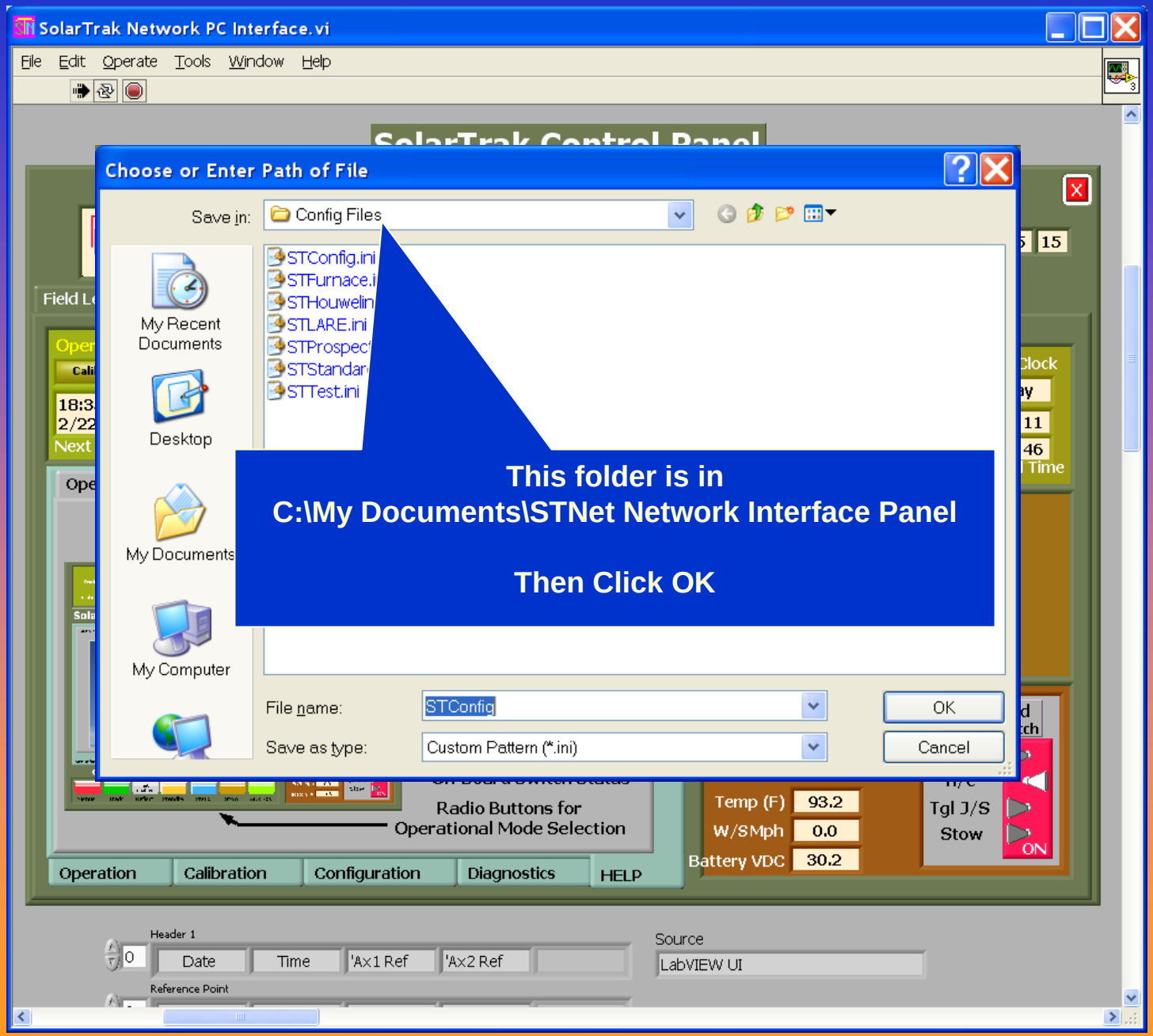
- http://www.ni.com/download/labview-run-time-engine-2011/2536/en/
- http://www.ni.com/download/ni-visa-run-time-engine-5.3/3826/en/
- LabVIEW-based SolarTrak Network PC Interface Win 7/10 (16 MB)

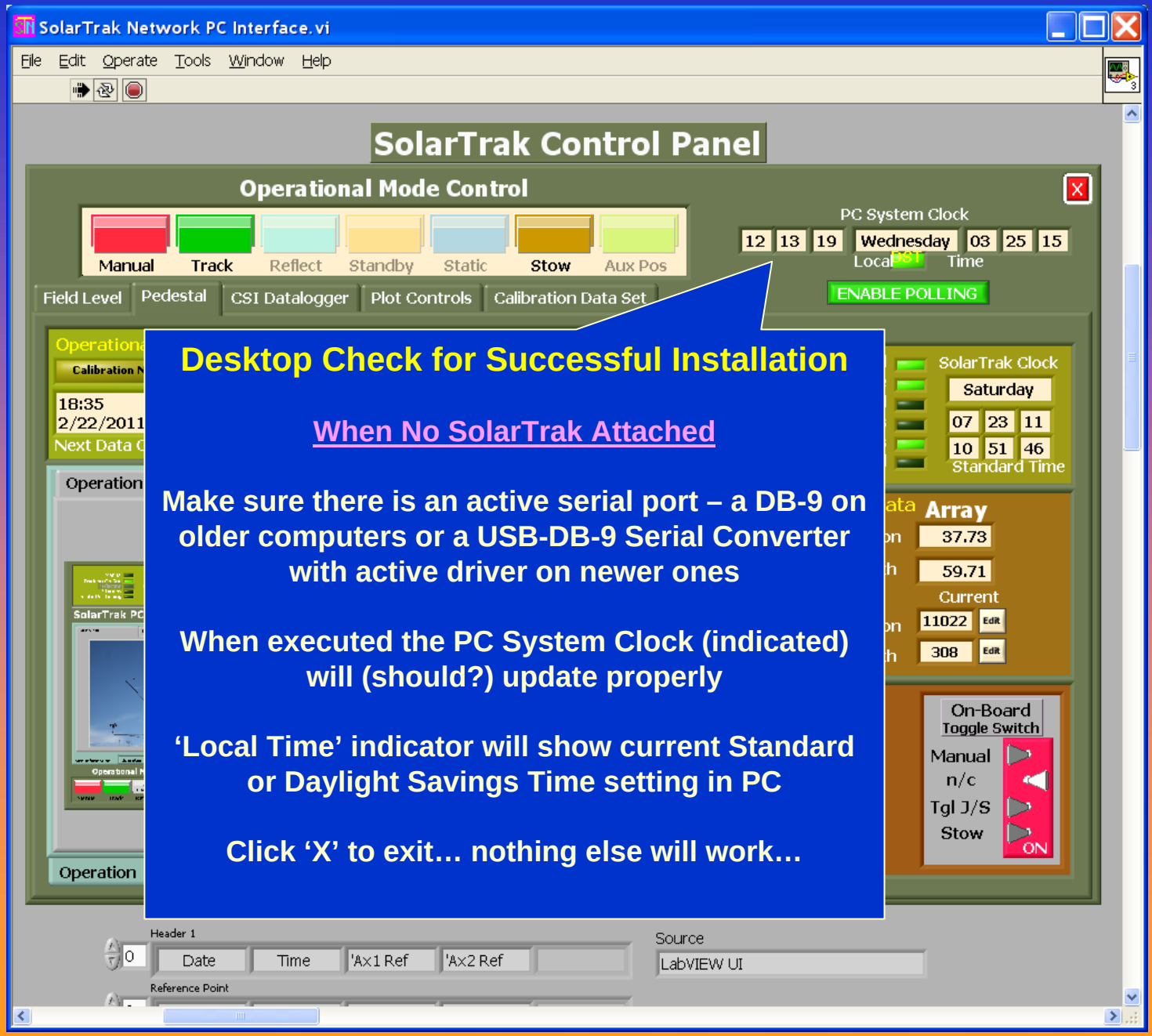
**Win XP:**

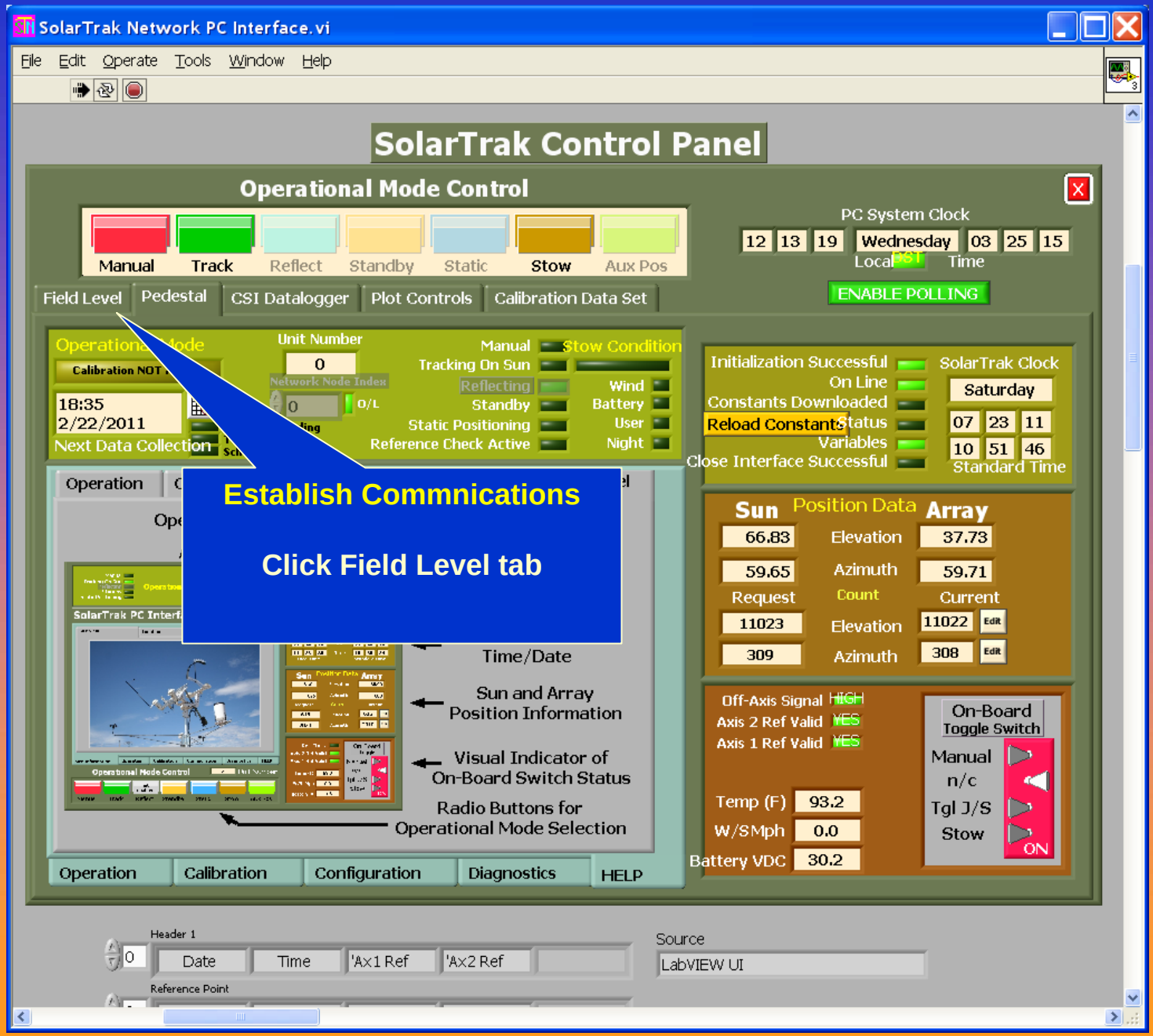
- http://www.ni.com/download/labview-run-time-engine-8.2/679/en/
- http://www.ni.com/download/ni-visa-run-time-engine-4.2/832/en/
- LabVIEW-based SolarTrak Network PC Interface Win XP (17 MB)

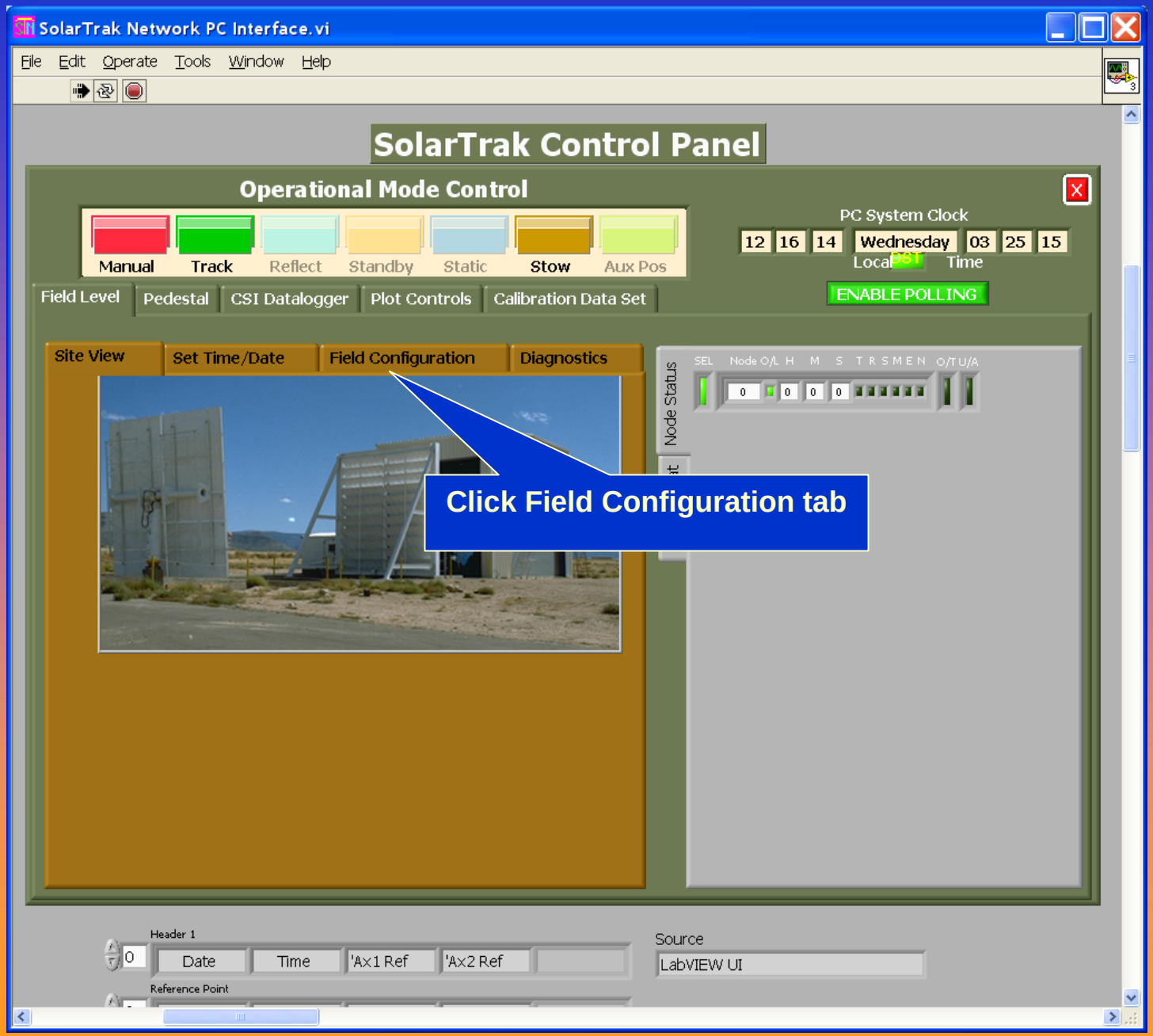
- Download and install both runtime components
- Download and unzip PC Interface software into ‘My Documents’ (creates folder)

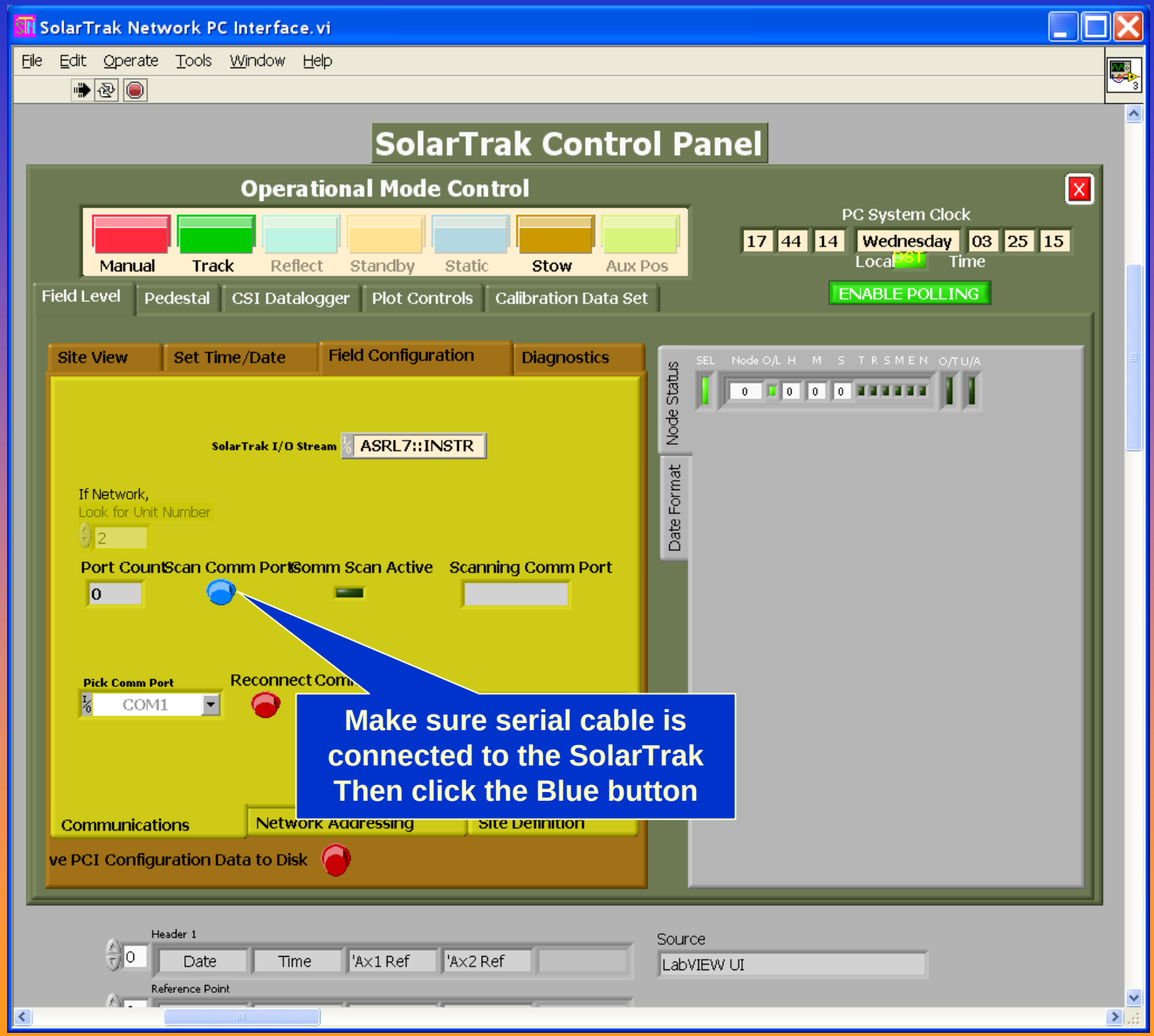
**Click STNet.exe to start**

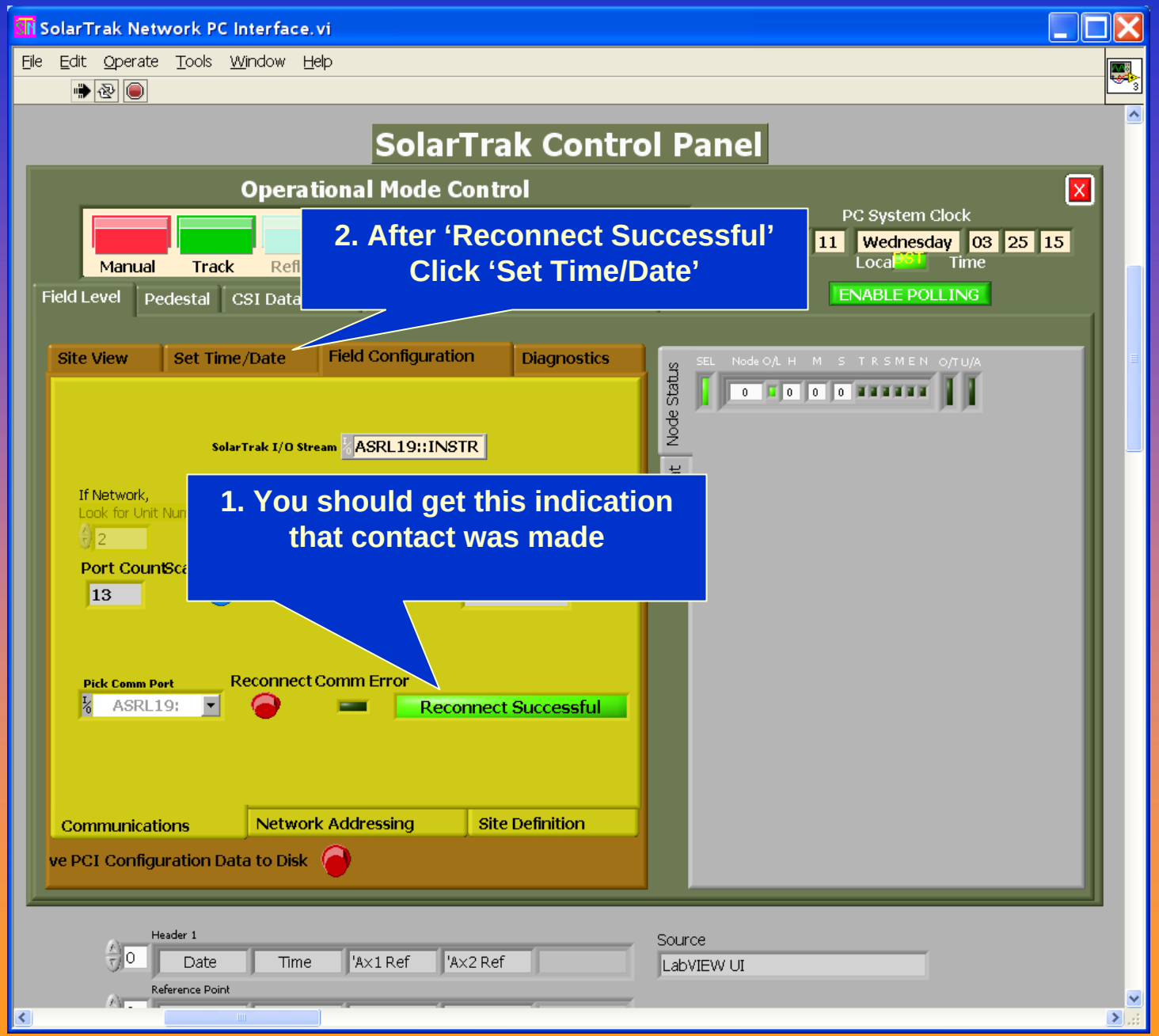

SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
Choose or Enter Path of File
Save in: Config Files
STConfig.ini
STFurnace.i
STHouwelin
STLARE.ini
STProspec
STStandar
STTest.ini
My Recent Documents
Desktop
My Documents
My Computer
This folder is in
C:\My Documents\STNet Network Interface Panel
Then Click OK
File name: STConfig
Save as type: Custom Pattern (*.ini)
OK
Cancel
Radio Buttons for
Operational Mode Selection
Temp (F) 93.2
W/S Mph 0.0
Battery VDC 30.2
Tgl J/S
Stow
ON
Operation
Calibration
Configuration
Diagnostics
HELP
Header 1
Date
Time
'Ax1 Ref
'Ax2 Ref
Source
LabVIEW UI
Reference Point

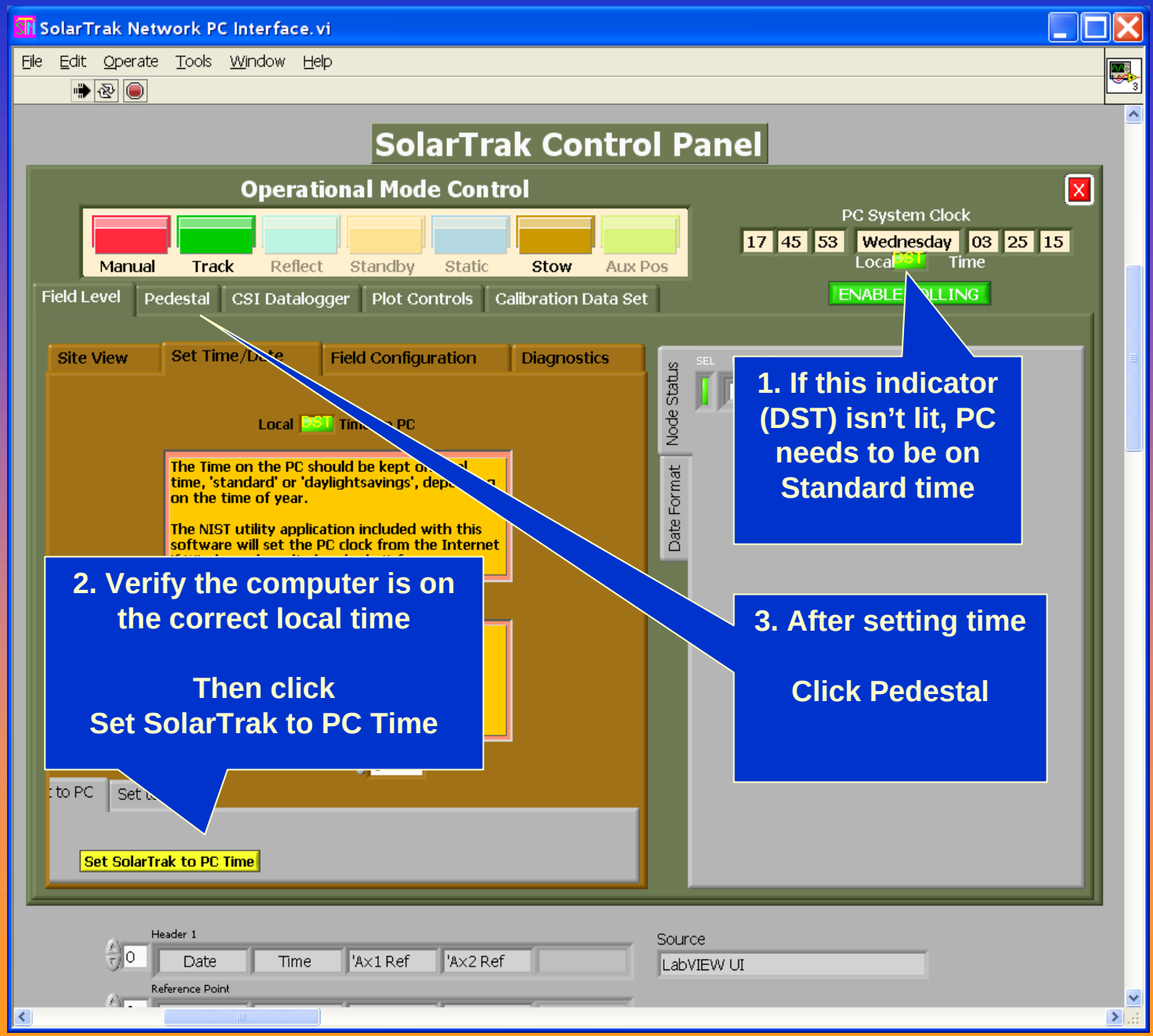

SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
SolarTrak Control Panel
Operational Mode Control
Manual Track Reflect Standby Static Stow Aux Pos
PC System Clock
12 13 19 Wednesday 03 25 15
Local DST Time
ENABLE POLLING
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
SolarTrak Clock
Saturday
07 23 11
10 51 46
Standard Time
Array
37.73
59.71
Current
11022 Edit
308 Edit
On-Board Toggle Switch
Manual
n/c
Tgl J/S
Stow
ON
Desktop Check for Successful Installation
When No SolarTrak Attached
Make sure there is an active serial port – a DB-9 on older computers or a USB-DB-9 Serial Converter with active driver on newer ones
When executed the PC System Clock (indicated) will (should?) update properly
'Local Time' indicator will show current Standard or Daylight Savings Time setting in PC
Click 'X' to exit… nothing else will work…
Header 1
Date Time 'Ax1 Ref 'Ax2 Ref
Source
LabVIEW UI
Reference Point

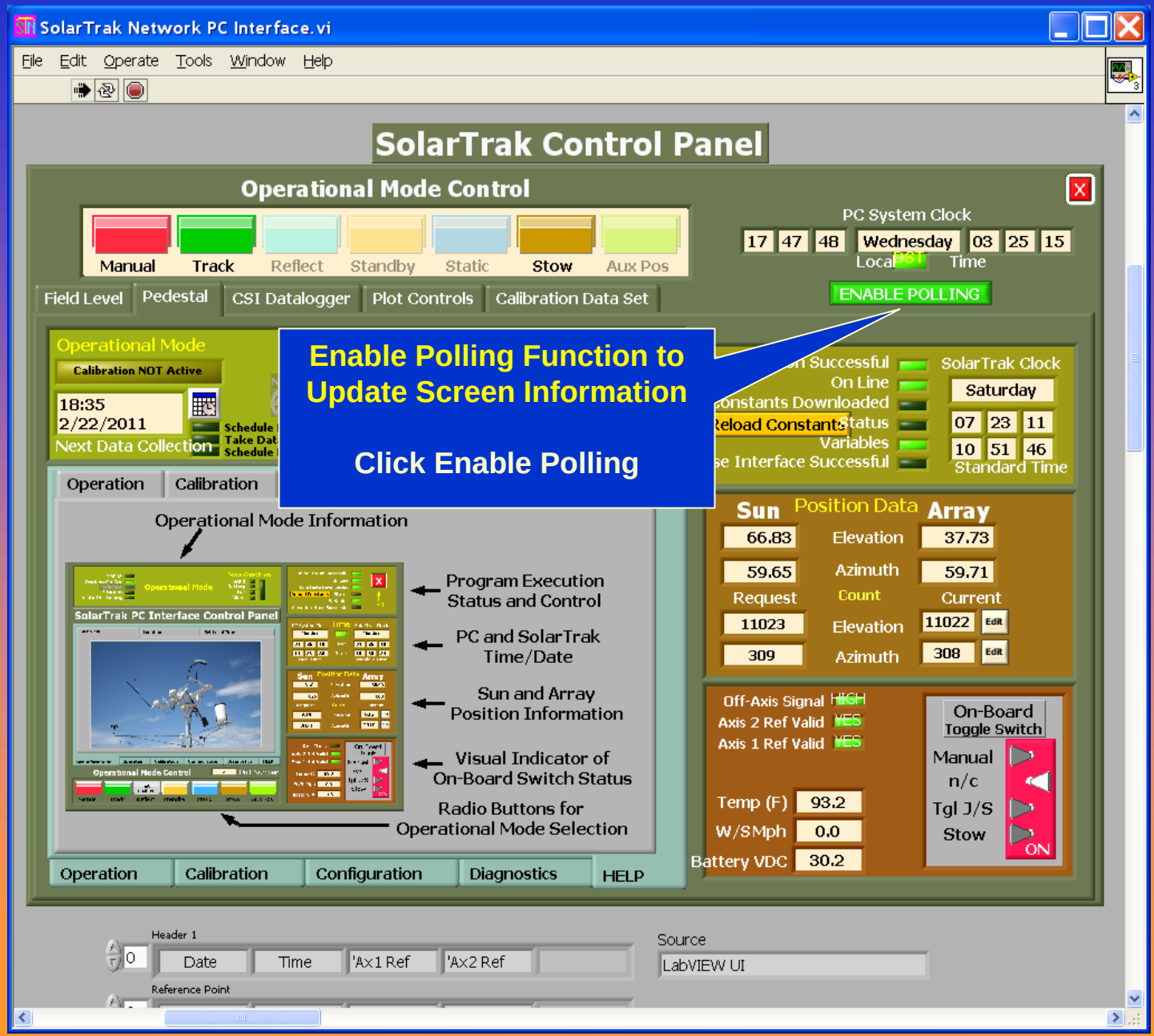

SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
SolarTrak Control Panel
Operational Mode Control
Manual Track Reflect Standby Static Stow Aux Pos
PC System Clock
12 13 19 Wednesday 03 25 15
Local PST Time
ENABLE POLLING
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
Unit Number
0
Manual
Tracking On Sun
Reflecting
Standby
Static Positioning
Reference Check Active
Stow Condition
Wind
Battery
User
Night
18:35
2/22/2011
Next Data Collection
Initialization Successful
On Line
Constants Downloaded
Reload Constants
Status
Variables
Close Interface Successful
SolarTrak Clock
Saturday
07 23 11
10 51 46
Standard Time
Establish Commnications
Click Field Level tab
Operation
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
Temp (F) 93.2
W/SMph 0.0
Battery VDC 30.2
On-Board Toggle Switch
Manual
n/c
Tgl J/S
Stow
ON
Operation Calibration Configuration Diagnostics HELP
Header 1
Date Time 'Ax1 Ref 'Ax2 Ref
Reference Point
Source
LabVIEW UI

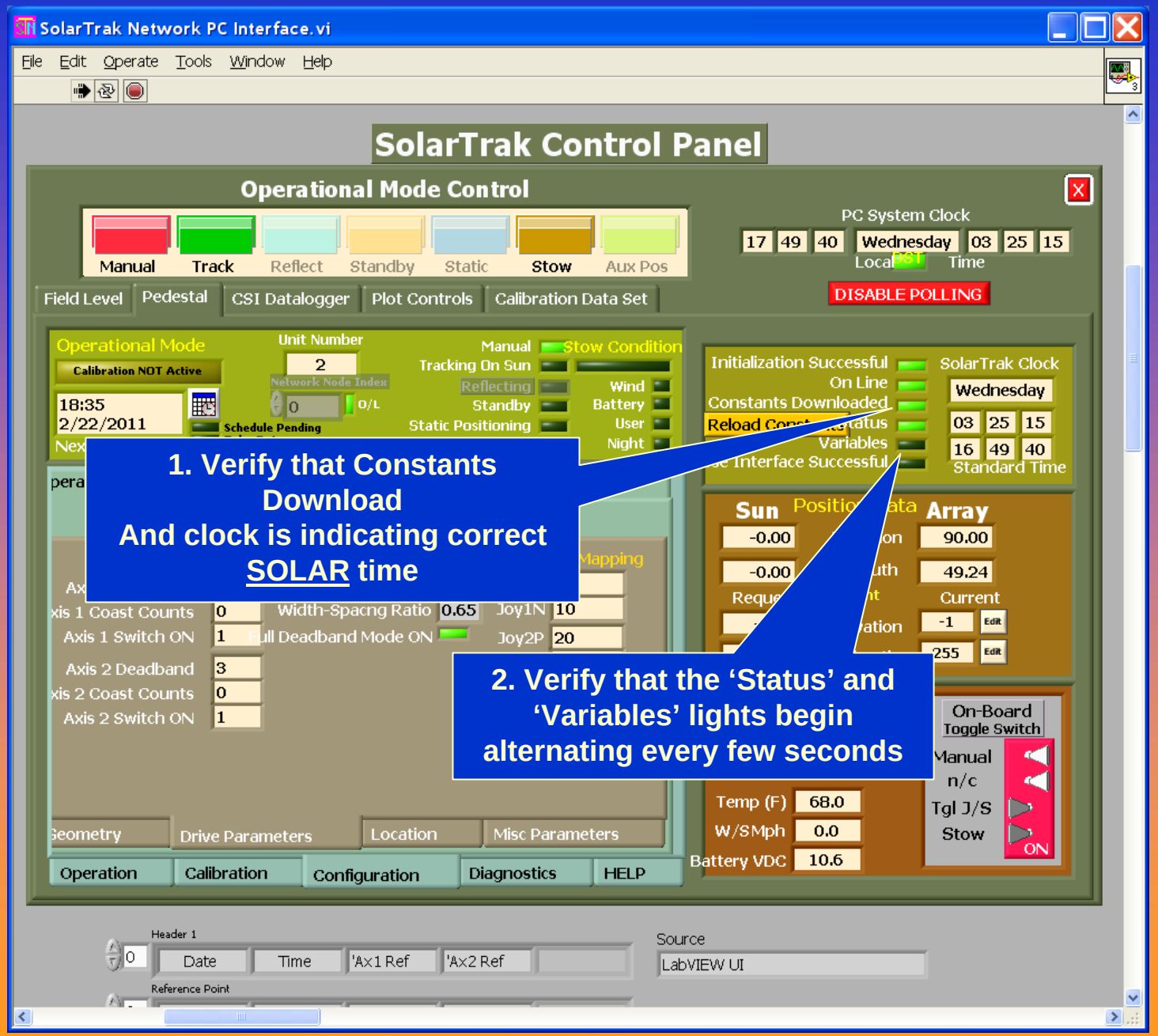

SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
SolarTrak Control Panel
Operational Mode Control
Manual Track Reflect Standby Static Stow Aux Pos
PC System Clock
12 16 14 Wednesday 03 25 15
Local Time
ENABLE POLLING
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
Site View Set Time/Date Field Configuration Diagnostics
Node Status
SEL Node O/L H M S T R S M E N O/T U/A
Click Field Configuration tab
Header 1
Date Time 'Ax1 Ref 'Ax2 Ref
Reference Point
Source
LabVIEW UI


SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
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 DST Time
ENABLE POLLING
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
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 Com
Node Status
Date Format
SEL Node O/L H M S T R S M E N O/T U/A
Make sure serial cable is connected to the SolarTrak Then click the Blue button
Communications
Network Addressing
Site Definition
ve PCI Configuration Data to Disk
Header 1
0
Date Time 'Ax1 Ref 'Ax2 Ref
Reference Point
Source
LabVIEW UI


SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
SolarTrak Control Panel
Operational Mode Control
Manual
Track
PC System Clock
11 Wednesday 03 25 15
Local Time
ENABLE POLLING
2. After 'Reconnect Successful' Click 'Set Time/Date'
Field Level
Pedestal
Site View
Set Time/Date
Field Configuration
Diagnostics
Node Status
SolarTrak I/O Stream
ASRL19::INSTR
If Network,
Port Count
13
1. You should get this indication that contact was made
Pick Comm Port
ASRL19:
Reconnect Comm Error
Reconnect Successful
Communications
Network Addressing
Site Definition
ve PCI Configuration Data to Disk
Header 1
Date
Time
Ax1 Ref
Ax2 Ref
Reference Point
Source
LabVIEW UI


SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
SolarTrak Control Panel
Operational Mode Control
Manual Track Reflect Standby Static Stow Aux Pos
PC System Clock
17 45 53 Wednesday 03 25 15
Local DST Time
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
Site View Set Time/Date Field Configuration Diagnostics
Node Status
Date Format
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
Set SolarTrak to PC Time
Header 1
Date Time 'Ax1 Ref 'Ax2 Ref
Reference Point
Source
LabVIEW UI


SolarTrak Network PC Interface.vi
File Edit Operate Tools Window Help
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 PST Time
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
ENABLE POLLING
Enable Polling Function to Update Screen Information
Click Enable Polling
Operational Mode
Calibration NOT Active
18:35
2/22/2011
Next Data Collection
Schedule
Take Dat
Schedule
Successful
On Line
onstants Downloaded
eload Constants
Status
Variables
e Interface Successful
SolarTrak Clock
Saturday
07 23 11
10 51 46
Standard Time
Operation Calibration
Operational Mode Information
SolarTrak PC Interface Control Panel
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 Network PC Interface.vi
File Edit Operate Tools Window Help
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
DISABLE POLLING
Field Level Pedestal CSI Datalogger Plot Controls Calibration Data Set
Operational Mode
Calibration NOT Active
18:35
2/22/2011
Schedule Pending
Unit Number
2
Network Node Index
Manual
Tracking On Sun
Reflecting
Standby
Static Positioning
Stow Condition
Wind
Battery
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
Sun
Array
-0.00
-0.00
90.00
49.24
Current
-1
Edit
Axis 1 Coast Counts 0
Axis 1 Switch ON 1
Axis 2 Deadband 3
Axis 2 Coast Counts 0
Axis 2 Switch ON 1
Width-Spacng Ratio 0.65
Full Deadband Mode ON
Joy1N 10
Joy2P 20
2. Verify that the 'Status' and 'Variables' lights begin alternating every few seconds
On-Board Toggle Switch
Manual
n/c
Tgl J/S
Stow
ON
Temp (F) 68.0
W/SMph 0.0
Battery VDC 10.6
Geometry
Drive Parameters
Location
Misc Parameters
Operation
Calibration
Configuration
Diagnostics
HELP
Header 1
Date
Time
'Ax1 Ref
'Ax2 Ref
Reference Point
Source
LabVIEW UI

# 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.

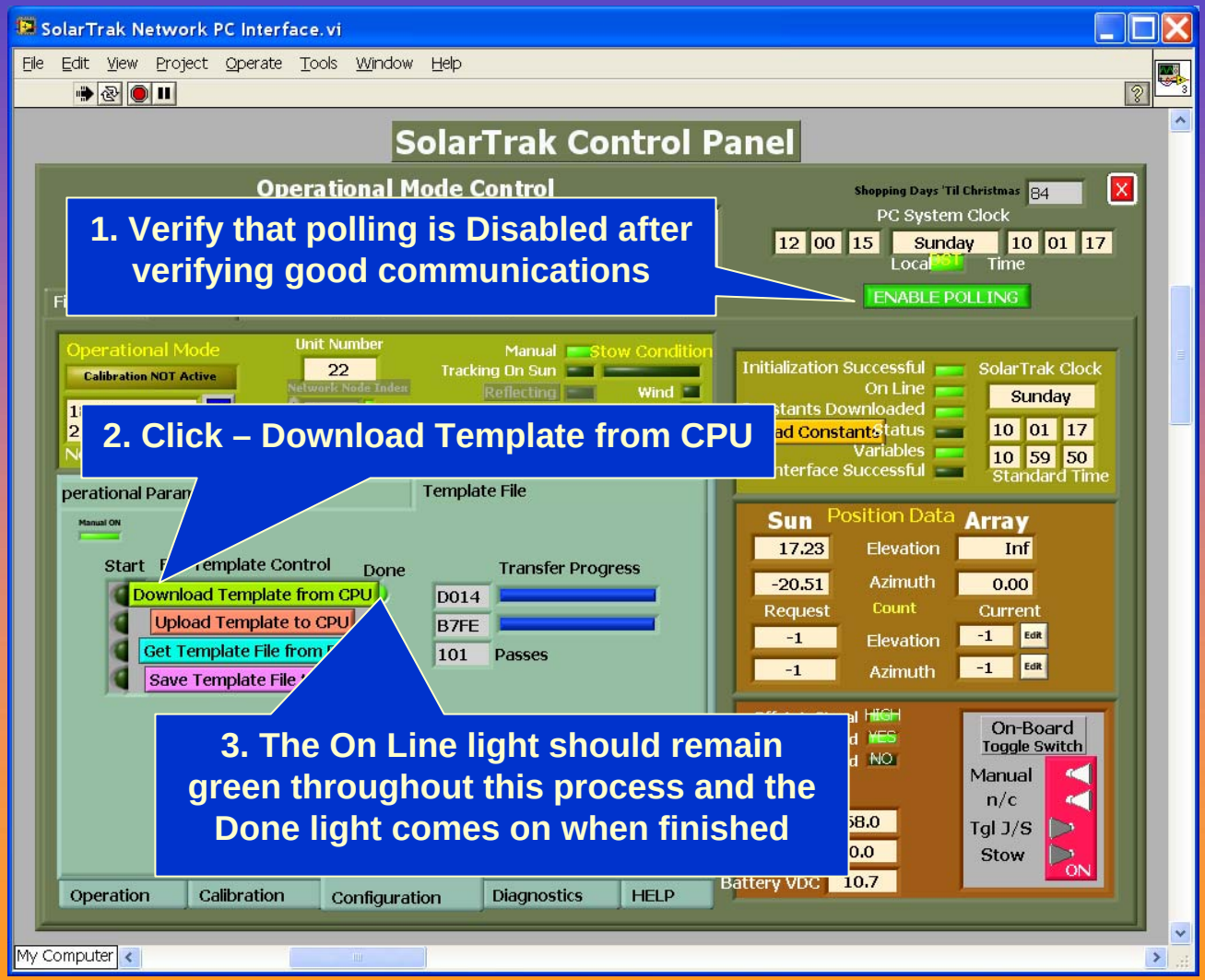
The use of parameter template transfer makes this rather straight forward. In preparation to utilize the PC interface in this manner, templates should be downloaded from all active controllers and stored on disk as a data base.

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.

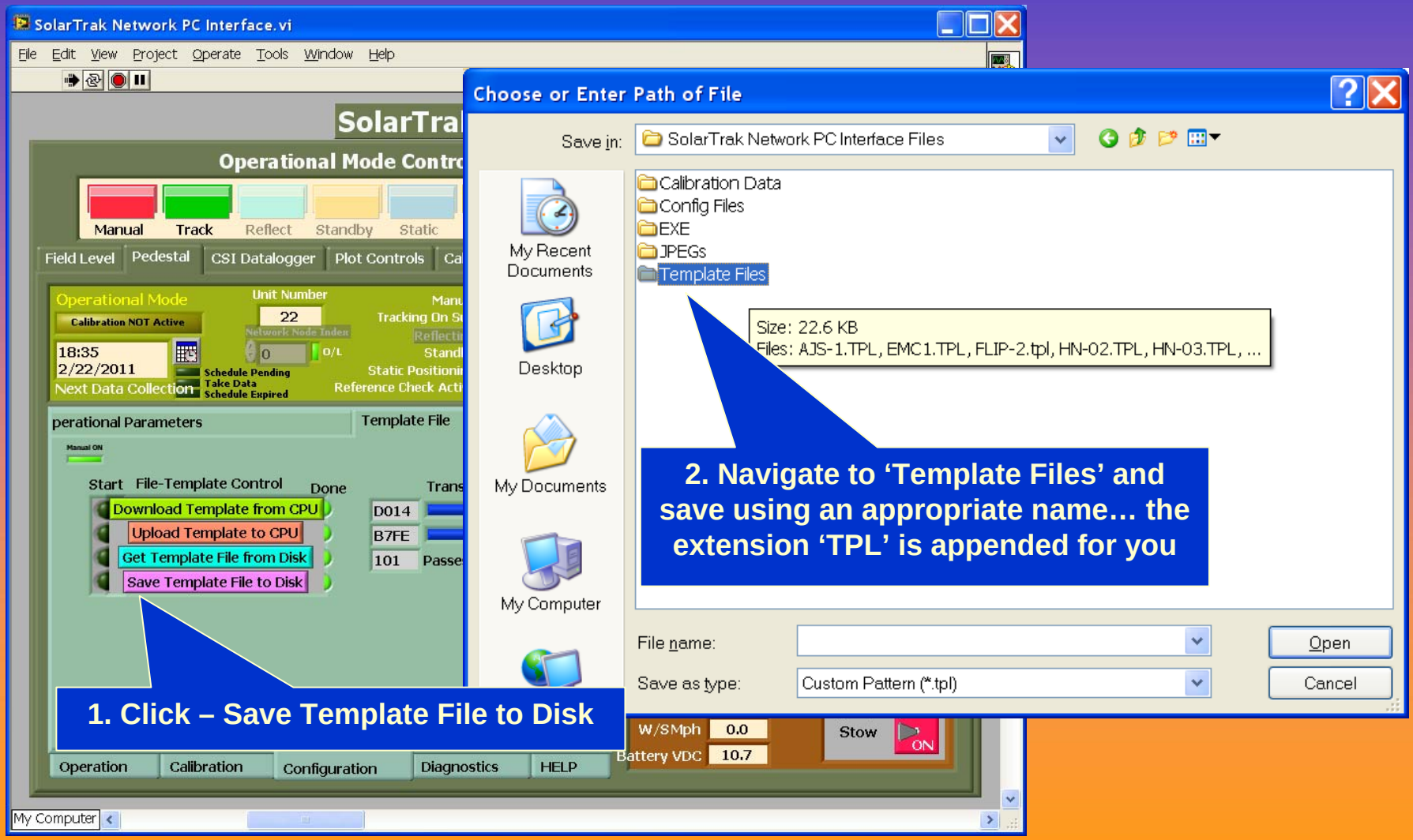
As a note though, in general, the SolarTrak MCU chip, containing all these parameters, is not damaged by any electrical incident that may occur, and can usually be removed from the old board and inserted in the new board without the need for all this computer stuff.

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



# Save Parameter Template



# Retrieve and Upload Parameter Template