APOLLO SOLAR

Internet Monitoring

Tutorial

IIAN TECH CO., LTD

Apollo Communications Gateway: Model ACG-1 or ACG-SNMP-1

Access any Apollo Solar installation from any computer via the Internet

Provides easy plug-and-play connectivity to Apollo products using Ethernet.

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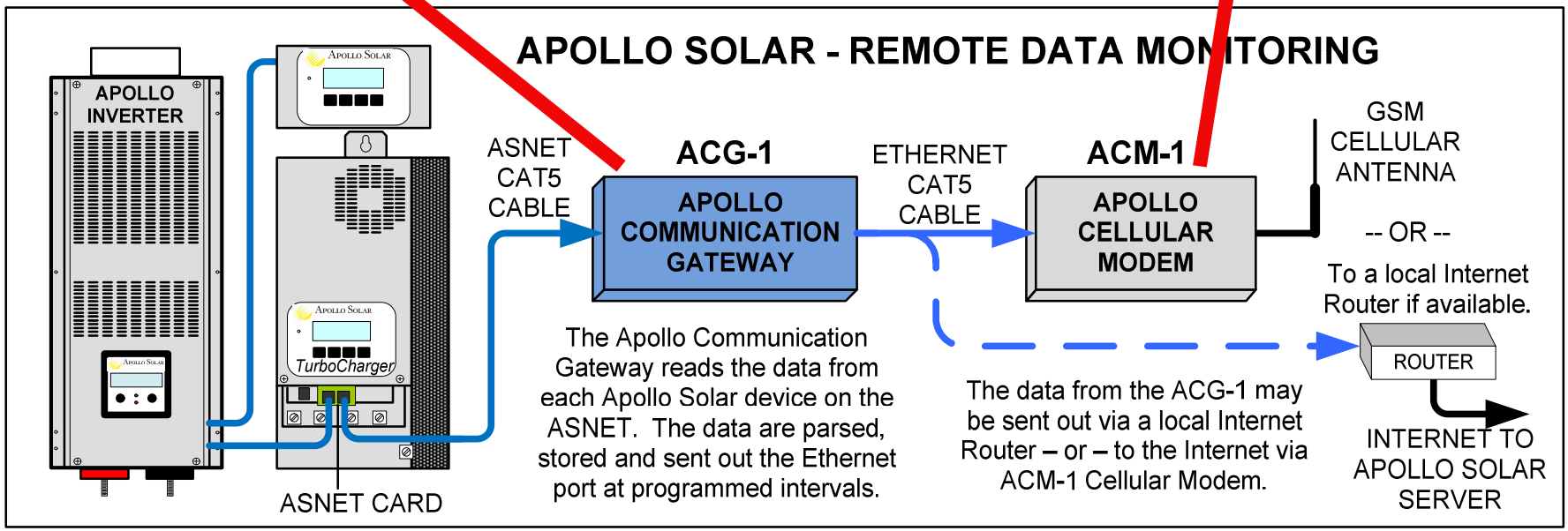
Apollo Solar Remote Data Monitoring

- Apollo Communication Gateway ACG-1

- Apollo Cellular Modem ACM-1



Apollo Remote Monitoring
How It Works

- The Apollo Communications Gateway initiates a TCP connection every 3 minutes with the Apollo server. (Because the Gateway initiates the connection, it works through routers and firewalls.)
- The Apollo server runs an asynchronous multithreading TCP server that does the following:
  - It accepts the incoming connection,
  - It discovers what charge controllers and inverters are attached,
  - It gets data from the attached devices every 6 seconds.
- The data is then stored in a large SQL Server database where it can be accessed by the Apollo web application.

System Diagram

User Browser

Optional Apollo Cellular Modem

Apollo Solar Server
-TCP Server
- Database
- Website

Local PC Application

ASNet (Apollo communications protocol)

ASNet over TCP/IP

Conventional Internet

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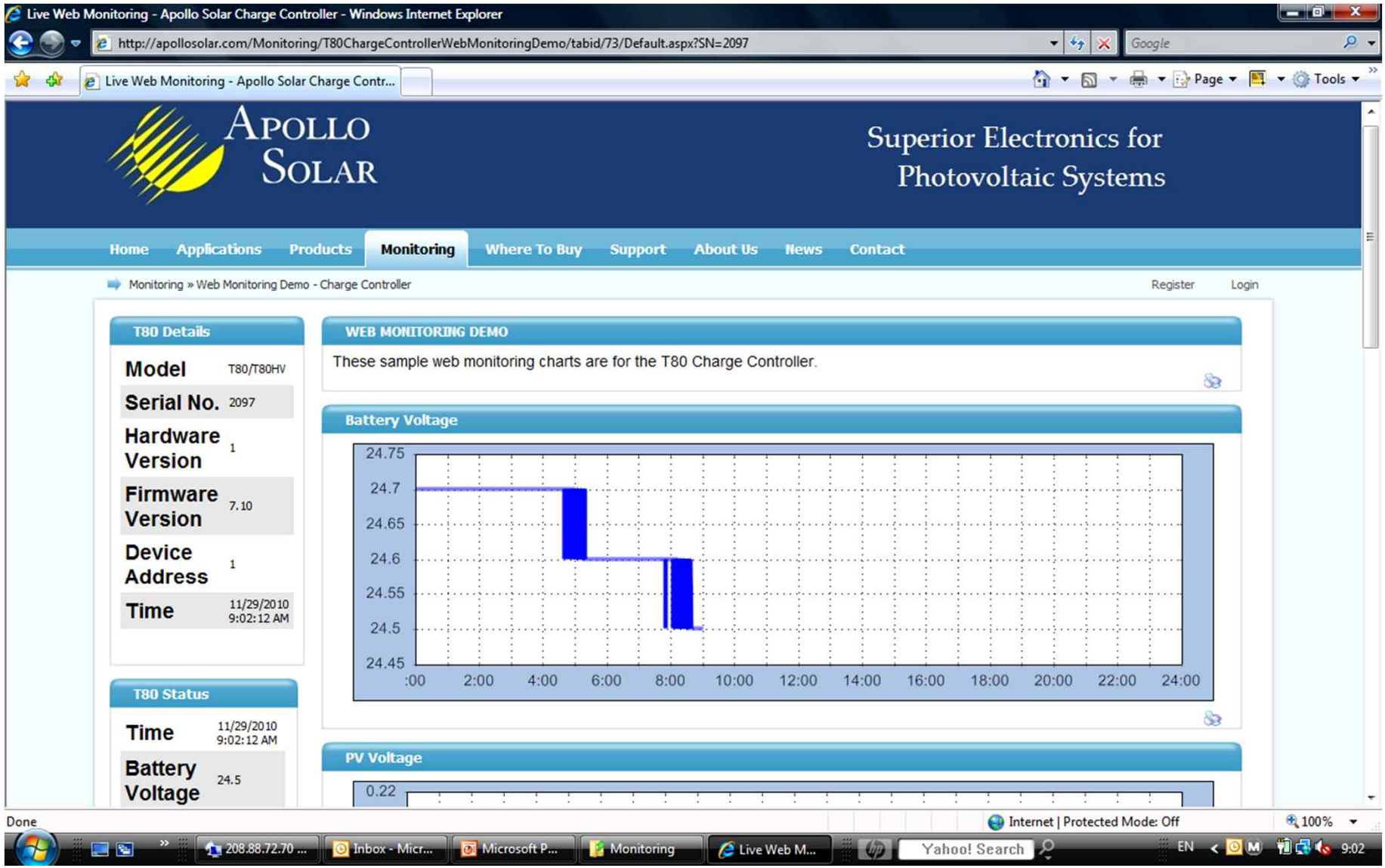
Sample Monitoring



Apollo Remote Monitoring
What You Need

1. **Device connectivity** – TSW inverters have communications built-in, the T80 Charge Controllers use an ASNet card
2. **Device Addressing** – to be properly discovered, T80 Charge Controllers must have addresses beginning with 1 or 2 and continuing sequentially up to 31, TSW Inverters need to start at address 32 and continue sequentially.
3. **Apollo Communications Gateway** – an Apollo Communications Gateway and the cable supplied to it. The ACG must be connected to one of the Apollo devices, and then the remaining devices are connected daisy-chain style with user-supplied standard Ethernet cables.
4. **Internet connectivity** – The Gateway is connected (using the supplied Ethernet cable) to an Ethernet, WiFi, or cellular network that has Internet access.

FAQ - Apollo Communications Gateway

1. How many T80 charge controllers can be monitored from one Gateway?
   - Up to 31
2. How many TSW inverters can be monitored from one Gateway?
   - Up to 31
3. How many total devices can be monitored from one Gateway?
   - Up to 255
4. How often is data sent from the Gateway to the server?
   - The server asks for data from a device every six seconds, or 14,400 times a day. If there is one T80 in the system, then there is data from the T80 every 6 seconds. If there is a T80 and a TSW inverter, then there is data for the T80 every 12 seconds and for the inverter every 12 seconds
5. Does the Gateway have to powered from the included AC power supply?
   - No, the Gateway can receive power from the T80 or TSW.
6. Does the Gateway have to be programmed or setup?
   - No, the Gateway is strictly plug-and-play.
7. How can I tell if the Gateway is communicating with the T80 or TSW and sending data to the Internet?
   - Refer to the Gateway user guide for detailed information, however if the Transmitting Serial LED blinks every 6 seconds then the Gateway is communication with the server. If the Transmitting Serial and Receiving Serial lights are blinking every 6 seconds then the Gateway is communicating with the server and with the attached Apollo devices.
8. Can a user use software on a local PC to communicate and get data from the Apollo devices using the Gateway?
   - Yes the Gateway will accept incoming requests. Apollo can provide sample code for communicating on a local network.

FAQ - Apollo Cellular Modem

- What cellular system does the ACM use?
  - The ACM uses GSM and supports the four different GSM frequencies used around the world, so it is compatible with every GSM system in every country. The ACM uses GPRS or EDGE for sending or receiving data.
- What do I need to use the ACM?
  - You need to get a SIM card for the cellular system that you want to use, enabled for data. You also need to get the APN (access point name) for the system.
- Is the cost of sending and receiving data included in the cost of the modem?
  - No, you need to enter into an agreement with your cellular provider for data services and pay accordingly.
- How much data does the ACM send?
  - The ACM will send and receive approximately 60 megabytes of data a month.
- Do I need to use a Gateway if I'm going to use the ACM?
  - Yes, you need to have a Gateway between the ACM and Apollo devices.
- Do I need to configure the ACM?
  - Yes, because you need to install the SIM card and configure the ACM to work with your particular cellular carrier's system. The basic installation steps include: install the SIM card; change the frequency of the modem if you are using it outside the USA; enter the APN (access point name) and username and password if required.
- What if I need or want to monitor using a carrier that uses CDMA?
  - On a special order basis Apollo can provide a CDMA modem or specify one for you.

FAQ - Monitoring from the Apollo Website

- How do I setup monitoring for my system?
  - Go to ApolloSolar.com and register.
  - Send an email or call Apollo solar and ask to have your monitoring setup. Email or have available your product serial numbers. We will setup your monitoring page and email or call you to let you know.
  - Once we tell you that your monitoring page has been setup, login to apollosolar.com and under the Monitoring tab you should see a link to your page.
- Can I download data to Excel?
  - Yes, just ask that a download page be setup for you.
- Can I get data reflecting my local time zone?
  - We will provide this shortly.

Apollo Communications Gateway: Model ACG-SNMP-1

1. The SNMP Gateway captures data from the TSW Inverter / Charger and converts it to Ethernet format and sends it to an Internet router.

2. The benefits of the Apollo Communications Gateway.
3. The Data available are as follows:
   a) Battery Voltage
   b) Battery Current (Charge or discharge)
   c) AC Output Voltage
   d) AC Output Frequency
   e) AC Output Current
   f) Aux (Door switches, Misc)

4. May be used directly to PC,

to internal intranet, or to the Internet via

Ethernet and/or Apollo GSM modem.

FAQ - Apollo SNMP Gateway

- Can the SNMP Gateway be customized in terms of SNMP traps and gets?
  - Yes, Apollo can customize and provide matching MIB file
- What SNMP protocols are supported?
  - SNMP versions 1, 2, and 3.
- Does the SNMP Gateway have a watchdog timer?
  - Yes, there is a watchdog timer that can be set to any interval.
- Can the SNMP Gateway be configured and have new software installed from remote locations?
  - Yes.
- Can the SNMP Gateway be configured to log data and then have log files uploaded remotely?
  - Yes.
- Can the SNMP Gateway be programmed to monitor additional equipment or sensors?
  - Yes, the SNMP Gateway can be configured to monitor additional devices that provide relay or digital outputs, or which have a communications protocol. The SNMP Gateway currently does not support analog inputs, although that is a possibility if the opportunity warrants it.