



Sunnytek solar based education solution

This is a new concept to get simpler and better education to lower cost than today's solutions. This solution is optimized for rural and other areas where there is no reliable electrical power and limitations in printed education material. We combine solar energy with good illumination in the education room. To this we add a computer system with interface to the teacher and a storage device for education material. Teacher controls lessons by a reliable LED based projector system that shows the material on a screen/wall. All is protected in a steel cabinet bolted to the floor and it has a rugged door with lock and a burglar alarm system.

Material can be distributed by DTV / Analogue TV or by USB or DVD format to the classroom.

If TV system is used we can automatically record the newest material in E-Learning at night and the teacher can use it the following day in a very simple way.

Sunnytek cooperates with producers of E-Learning materials that can be distributed by Web browsing, TV transmissions or other portable media.

Features of Sunnytek education solution

- * Own power solution and no need for any grid
- * Generate illumination and all power needed for the school room + a little extra for mobile phones etc
- * Education material can be distributed by national TV transmission all over the area to low cost
- * Education material can also be delivered by DVD / CD or USB / memory sticks
- * Teacher controls all actions and education profile
- * No books are needed as we have a LED projector and a screen to show all materials
- * W-Lan interface so own tablet PC etc can be used in system
- * Best quality hardware (Mac based) and local service available world wide

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Solar power pack that generates the needed energy.

This is normally designed in modules for 1 class room and include solar panel and hard ware for roof installation. Typically we have one 240W solar panel giving 24 volt output. This charge 2 pcs 12 volt solar battery packs with 130A storage capacity. We have a charger controller that control charging and battery health. The battery is connected to an Inverter that gives 110/ 240 Volt AC output.

All parts ex solar panel are installed in a solid steel cabinet with a key lock. The cabinet is bolted to the floor and hard to remove. To add security we have a burglar alarm with siren sounder and light flash output to alert that some one is there without permission.

System gives 230 Volt output for following

- * 100W led lamp illumination preferable by Tellux high efficiency led tubes = 4 pcs of 1200 mm model / 20W /ea =80W Which is enough for a typical 60 M2 school room.
- * 5W outdoor lamp to be installed just outside the classroom
- * Mobile phone charger output 25W for adapters etc.
- * Charger for the wireless keyboard and mouse for the teacher
- * Integrated computer system MAC Mini with external 2GB HD and external TV/ DTV adapter
- * Alarm system to protect the system in box + disconnection of the external panel.
- * Accessories max 100W in power for up to 3 hours



Battery pack and solar panels are designed to operate system in most Tropical areas and can handle 2-3 cloudy days without any limitations. Operation time per day is 8 hours in daytime with lamps and computer + 2-3 hours work in darkness.

This is OK in most cases but if area is having many cloudy days we can offer a larger panel and battery pack. Here we have 2 panels and a larger 2x230AH battery packs.

If area often have over + 30C in temperature we use a Li-Fe-Po battery that is better when charged hot. Here we can handle + 50C with over 5 years life time of battery.

In colder areas we have a lead battery and if used at 20-25C it will possible last for 5-6 years.

If colder we can have a high quality lead battery of highest quality. Here car battery is a very bad solution with very short life cycle.





Computer system, teachers interface and the projector.

MAC mini computer systems is the best choice in this type of application. Quality is high and software excellent and its user friendly functionality is very important for starting up with unexperienced staff.

Apple have service world wide and are reliable so this was a simple choice.

DTV / TV system receiver that read National Education program and by command we can automatically record what is needed for the education. Software control timing and recording so this can be recorded automatically at nights.



Following day the teacher can use what was recorded for education. Beside TV we can use CD/DVD and USB and other memories with software.

We can include computer speakers to get enough volume for a class room. All is controlled by the keyboard and mouse by the teacher

LED projector gives the fundamental output for education and is projected on a screen or a white wall. Here all in classroom can see output of the system.

Projector is led based and have no need for lamp exchange. Resolution is VGA and brightness is 2000-3000 Lumen.

Teacher normally use the projector as output but computer have a VGA standard computer output if preferred.

We have higher resolution and higher brightness if needed.



Protection is essential and the system contain parts that many want to steel. By this reason we have a solid steel cabinet with dual locks at door + extra lock. Cabinet is bolted down into the cement floor or walls with large diameter bolts.

Most parts are protected inside here and can not get stolen in a simple way. We also have a vibration activated alarm that starts a siren and a led flasher that alert area that someone is trying to do something.

The solar panel have special mount and is also activating alarms if cables are cut.

Projector is in a cage bolted on ceiling and hard to remove. It is also connected to the alarm system. We use special screws and a lock to protect the unit.

Software and education material

Computer is MAC mini with Apple OS. This is the most well known and reliable solution available today.

Apple is focused to education and have lots of software available in iTunes etc.

National TV transmissions do often contain lots of useable material that

is free of charge.



Web interface is possible with the MAC standard software. Here lots is available by browsing. Wikipedia is here a gold mine for free information. Here we can use fibre interface or USB modems to get access to the enormous WWW database.

The TV solution records what is on TV. Here we look at Kenya where the new digital TV system with have a 24 hour education channel with lots of useable materials. Many other areas have alternative solutions.

E-Learning is available for many sources. Sunnytek cooperate with local partners to offer what fits best. Here local traditions and demands are so complex that it is a must to have a local cooperation partner. We often use what is compatible with Apple.

Alternative 1 is that the projector is used and then there is a limited need for education books etc.

Alternative 2 is that system also have W-Lan and students have a tablet of a suitable design.

Both solutions are supported by the Sunnytek education and energy system

