

An Automated Scoring System and Deliverables

LIN Yang
CHENG Kun
WU Yunfeng

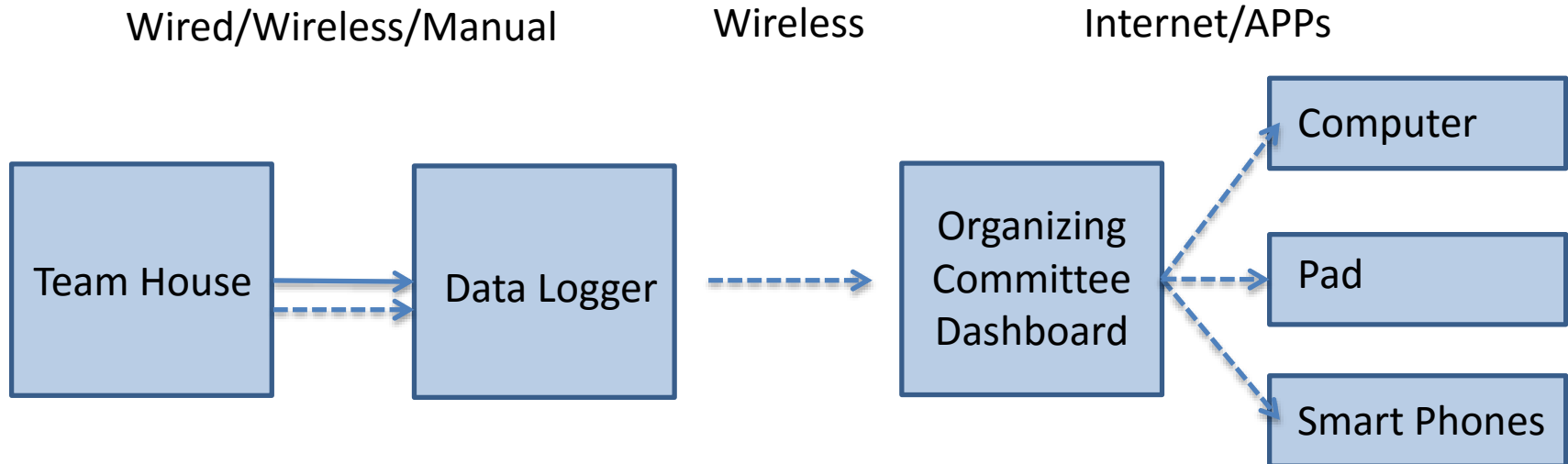
Classifications of the measurement items

Monitored	Recorded Manually Task	Juried
Temperature, 6-1	Clothes Washer, 7-3	Architecture, 1
Humidity , 6-2	Clothes Drying, 7-4	Market Appeal, 2
Refrigerator, 7-1	Dishwasher With Irreversible Thermometric Paper, 7-5	Engineering, 3
Freezer, 7-2	Cooking, 7-6	Communications, 4
Energy Production, 10-1	Lighting, 8-1	Innovation, 5
Energy Consumption, 10-2	Hot Water, 8-2	Home Electronics, 8-3
Environment Monitoring Public	Commuting, 9	Dinner Party, 8-4
		Movie Night, 8-5

Monitored Performance Sub-contests

- Sub-contest **6-1**: Temperature
Keep zone(s) temperature in 71° F to 76° F (22° C to 24° C) range
- Sub-contest **6-2**: Humidity
Keep zone(s) relative humidity below 60%
- Sub-contest **7-1**: Refrigerator
Keep refrigerator temperature in 34° F to 40° F (1° C to 4° C) range
- Sub-contest **7-2**: Freezer
Keep freezer temperature in -20° F to 5° F (-29° C to -15° C) range
- **Contest 10: Energy Balance**
Produce at least as much electrical energy (kWh) as is consumed during contest week

Automated Scoring System Logic Diagram



Sensor and Instrumentation

- Data Logger
- Temperature and Humidity Sensors
- Flow Meter
- Power Meter
- Scales (Kitchen and Towel Scales)
- Irreversible Thermometric Paper

Dashboard

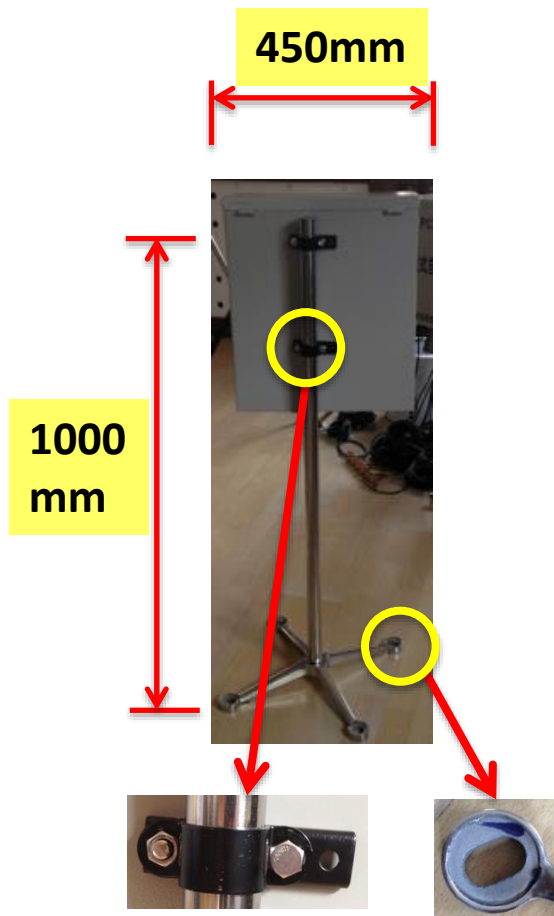
- Manual Scoring
- Table Scoring
- Monitoring Scoring

Data Logger

- Data Location
 - One data logger will be mounted in each house Mechanical Room,
- Collection Process
 - Data logger reads sensors, averages/totals sampled data, and stores official 15-minute data.
 - Central Solar Decathlon server collects data from each house and processes data to create scores
 - Organizers monitor and review scoring to ensure accuracy, availability, and accessibility
- Power Supply
 - The data logger need 220V AC, Power 3 holes, 1m cable
- Monitoring
 - The data will be collected by computer in every 15 minutes through this data logger

A team may be penalized for tampering with this this equipment.

Mounting system



Teams shall not tamper with this equipment!!!

Temperature and Humidity Sensors



ventilation hood

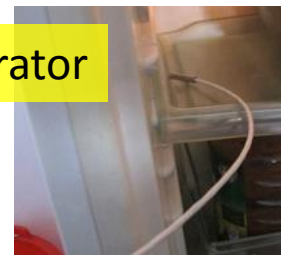


Sensor

- Wired Sensors connected with data logger through RS485 cable; Wireless Sensors might be used as well,
- There are at least 2 sensors in each house.

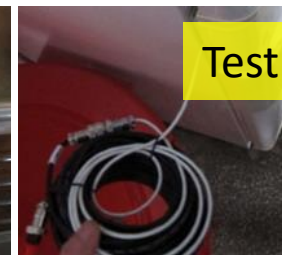
Refrigerator and Freezer

Refrigerator



Freezer

Testing

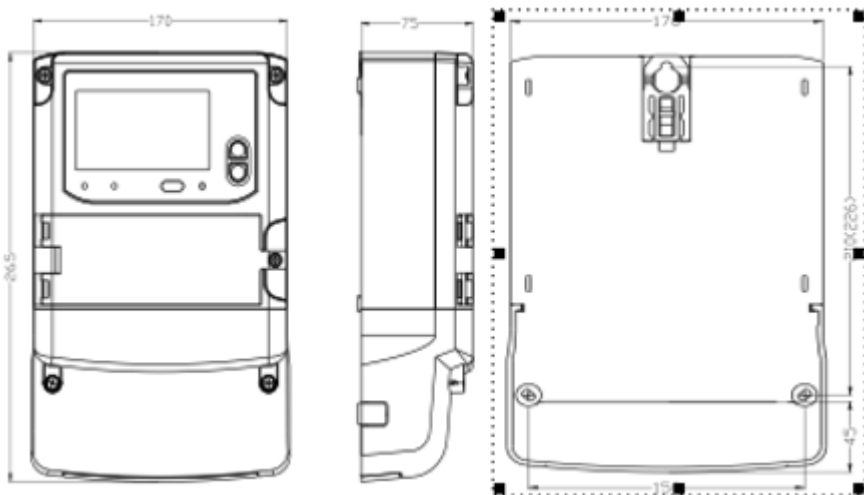
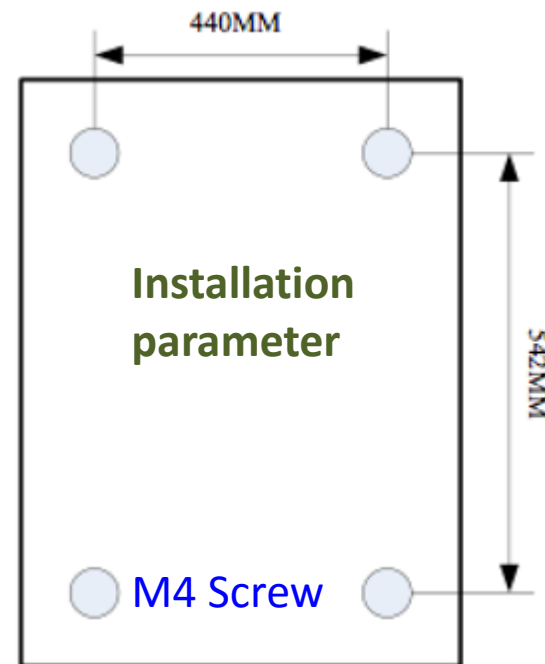
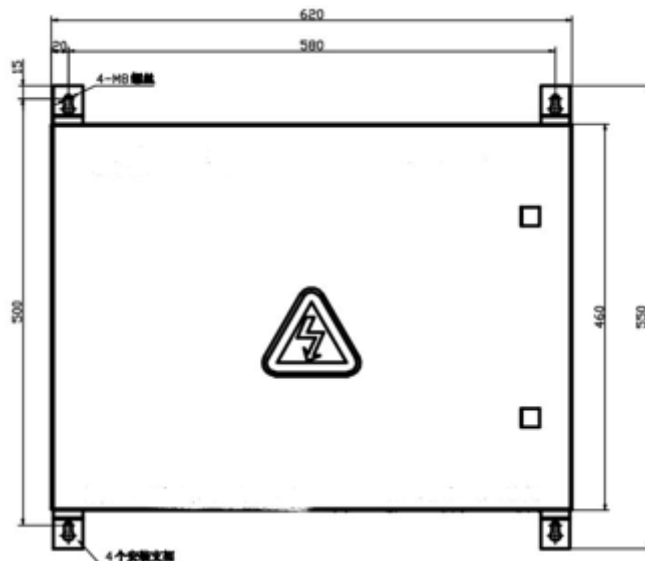


Protection

- The cable inside is much thinner than outside,
- The temperature sensor has a protection outside for preventing the temperature changed quickly.



A team may be penalized for tampering with this this equipment.



- Every meter has a meter box to protect the safety.
- Every meter box has a meter and a switch.
- Every meter connect with datalogger with wireless or RS485 communication cable.

Dashboard

- Right Level
 - Team (team)
 - Jury (judge)
 - Competition Manger(auditor)
- Function
 - Scoring
 - Weather information
 - Total score ranking



Revised Version

TIME	CONTENT
18. July. 2016	Schematic Design
15. Aug. 2016	Feedback from Committee
Nov. 2016	Design Development
Jan. 2017 (TBD)	Second Technical Training Workshop
Feb. 2017	Construction Document
Apr. 2017	Concrete Foundation Document
17. July. 2017 (Tentative)	Competition Begins

SOLAR DECATHLON

程昆 CHENG Kun
Mobile: +86 15201519715
Email: chengkun0928@gmail.com

林阳 LIN Yang
Mobile: +86 1861 117 3240
Email: cn_lyang@sina.com
linyang0312@gmail.com