Battery and solar sizing

Calculate the daily power consumption

How many times per hour does the application switches on?	120	per hour
How long does it stays switched on on each event	5	s
Total time of the device being switch on	600	s
What is the supply voltage?	3.3	V
What is the current used?	250	mA
What is the power consumption of the device?	0.825	W
Hourly power consumption		
Formula = Time (s) / 3600 x Power (W) = Wh	0.1375	Wh
Daily power consuption		
Formula = Wh x 24 = Daily power consumption	3.3	Wh
Days of redundancy		
How many days does it need to cover without charging?	5	Days
Formula = Daily power consumption x days of redundancy	16.5	Wh

Convert power consumption to battery capacity

What's the common voltage for the battery?	3.7	V
Formula = Power consumption (Wh) / Battery voltage (V)	4.46	Ah
Safety margin	20	%
Formula = Battery capacity (Ah) x safety margin (%)	5.35	Ah

Calculate the size of solar panel

Average amount of sunshine for the darkest month per day	5	h
Formula = Daily power consumption (Wh) / sunshine h/day	0.7	W
Safety margin	20	%
Formula = PV panel size (W) x safety margin (%)	0.8	W

Conclusion

For the application we will need the following:

A battery with a capacity of	5.35	Ah
and a solar panel of size	0.8	W

Average number of days with sun or cloud

City	Sunny	Cloudy
Adelaide	4	16
Ballarat	3	16
Bendigo	6	12
Bundaberg	13	6
Cairns	9	10
Canberra	8	12
Coffs Harbour	11	9
Darwin	18	3
Hobart	4	14
Launceston	5	15
Mackay	12	7
Maitland	8	10
Melbourne	3	18
Newcastle	6	12
Perth	8	10
Rockhampton	13	7
Sydney	9	10
Toowoomba	10	9
Townsville	12	8

(LiPo or lithium ion = 3.7V, LiFePo4 = 4.1V)

Average hours of bright sunshine in June

City	Day	Month
Adeliade	5	135
Cairns	7	210
Canberra	5	159
Coffs Harbour	7	201
Darwin	10	303
Mackay	7	219
Melbourne	4	123
Perth	6	180
Sydney	6	171
Townsville	8	231

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