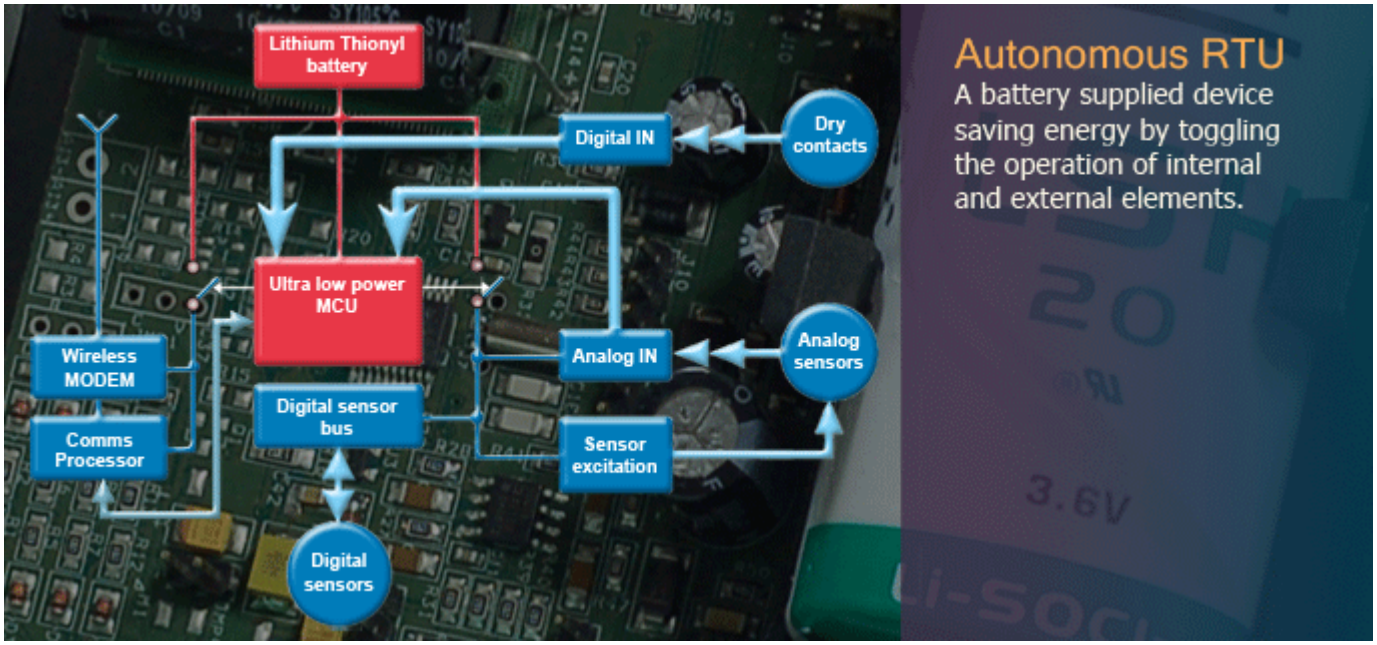
BSC-50
ADU-500

Autonomous RTUs

infinite

Operating principle



Functions:

- Measurement
- Transducer excitation
- Data recording
- Data & alarm transmission

An ultra low power MCU is in continuous operation with two main tasks:

•Performing measurement, data recording and detecting an alarm condition.

•Controlling power of internal and external functional elements in order to extend battery lifetime. The principle is to power functional sections, according to user defined time schedules.

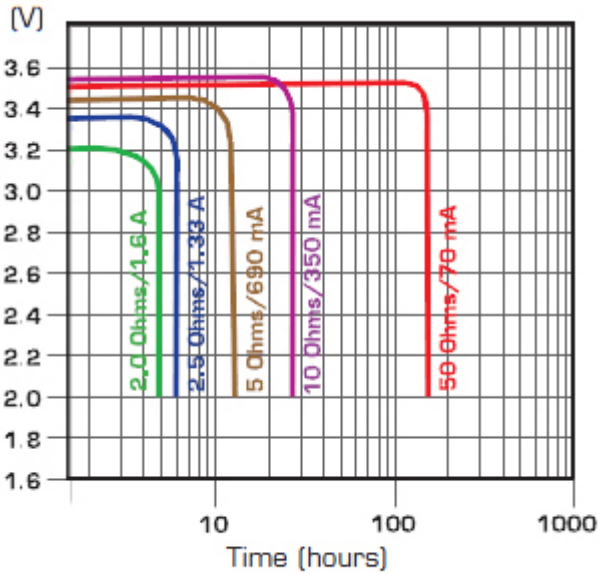
Infinite's autonomous RTUs utilize a dual processor architecture in order to combine extreme low power consumption with advanced processing and communication characteristics.

D-size, Primary lithium-thionyl chloride battery, Nominal voltage: 3.6V, Capacity: 13.0Ah

System comparison

Subject	Solar powered	Autonomous
Daily energy consumption	2 mAh (An average 2 mA current draw is assumed).	0.03 mAh (2 mA during sampling, 40 µA in idle state, sampling period at 1 minute).
Maintenance free operation	2-3 years. The rechargeable cell's capacity diminishes over time. Current delivery is reduced due to increase in internal resistance over time.	Up to 15 years. The Lithium Thionyl battery features undiminished voltage level and current delivery during almost 98% of its lifetime.
System power supply	Complex, costly.	Simple, low cost.
Ambient temperature	Frost protection for the solar cell is required at lower temperatures. Solar cell efficiency is lowered and rechargeable battery life is shortened at temperatures over 40°C.	Infinite's autonomous devices operate at temperatures between −20°C and +65°C.
Weather conditions	Smooth operation depends on sufficient sunlight.	Weather independent.
Overall system size	Massive, provoking vandalism.	Minimum sized, compact, unnoticeable.
Minimum sampling period	Down to a few seconds, according to the availability of the renewable energy source.	1 minute (5...15 minutes, typ) for preserving a reasonable battery lifetime.

Lithium Thionyl Battery



Typical discharge profiles at + 20°C

Autonomous devices

BSC-50 E, RTU/Data Logger

Supply current:	Continuous: 40µA, Messaging: av. 30mA, 2A peak
Digital inputs:	4, 0-30VDC
Pulse counters:	1, 40Hz, common with DI 4
Analog inputs:	2, 10 bit resolution, 3 gain ranges
Excitation:	7V/140mA or 12VDC/80mA, 5VDC/100mA, 3.5V/200mA
Wireless modem:	Quad Band GSM/GPRS (850/900/1800/1900MHz)
Messages:	Alarm, Status, Data
Temperature:	-20°...+65°C, operating

BSC-50 D, alarming RTU

Supply current:	Continuous: 40µA, Messaging: avg. 30mA, 2A peak
Digital inputs:	4, 0-30VDC
Wireless modem:	Quad Band GSM/GPRS (850/900/1800/1900MHz)
Messages:	Alarm, Status
Temperature:	-20°...+65°C, operating

Autonomous devices

ADU-500, RTU/Data Logger

Supply current:	Continuous: 18µA, Messaging: av. 50mA, 2A peak
SDI12:	SDI-12 sensor data acquisition up to 48 channels
Digital inputs:	3, 0-30VDC
Pulse counters:	1, 2KHz, common with DI 3
Analog inputs:	2, 12 bit resolution, differential, 1-200 programmable gain
Excitation:	9V/350mA or 12VDC/250mA, 5VDC/200mA, 3.3V/1A
Wireless modem:	Quad Band GSM/GPRS (850/900/1800/1900MHz)
Data:	ftp over GPRS
Messages:	SMS for Alarm, Status, Data
Temperature:	-40°...+65°C, operating

Coming soon,

Q2 2014 ADU-400 Transient recorder

Transient recorder featuring up to 8Khz recording. Built in accelerometer, 3 Analogue inputes, 3 digital inputs.

Q3 2014 ADU-500 RS485 Modbus

Water resources management

- River level & flow gauging
- Groundwater monitoring
- Lake and reservoir level monitoring
- Leak detection in distribution pipelines
- Sewer water monitoring

Devices: ADU-500 RTU/Data logger
BSC-50 E RTU/Data logger

Power grid

Earth fault detection and localization in urban power distribution systems

- Seamless connection to SCADA via OPC server
- Earth faults can be located in the first minute after occurrence.
- M2M functionality in combination with the SCOM-100 GSM controller
- Significant reduction of the CAIDI and SAIDI reliability indicators

Devices: BSC-50 D alarming RTU
BSC-50 E RTU/Data logger
in combination with earth ground fault detection relays

Weather conditions monitoring

Agriculture related weather measurements:

- Solar radiation
- Air temperature and relative humidity
- Wind speed and direction
- Rainfall
- Soil temperature and moisture

Devices: ADU-500 RTU/Data logger

Environmental Monitoring

Air quality measurements

- Ozone, nitrogen dioxide, sulphur dioxide, carbon monoxide

Impact measurements in rivers

- pH, dissolved oxygen, conductivity, turbidity, color

Soil quality and sustainability

- Soil moisture, electrical conductivity, temperature

Devices: ADU-500 RTU/Data logger

Gas Distribution

- Flow and pressure
- Moisture and leak detection
- M2M functionality in combination with the SCOM-100 GSM controller
- Level measurement on Gas Storage Tanks, as LPG tanks

Devices: BSC-50 D alarming RTU
BSC-50 E RTU/Data logger

Off-grid cell site monitoring

- Power issues: Generator voltage, current
- Diesel fuel level
- Backup battery readiness
- Temperature and humidity
- Smoke and water
- Tower lighting
- Door open and motion detection

Devices: ADU-500 RTU/Data logger

Battery lifetime

BSC-50E RTU/Data logger powered by one 3.6V, 13Ah lithium-thionyl battery

Excitation @3.3V [mA]	Sampling rate [S/hour]	Sampling delay [sec]	Sending rate [hours]	Battery life [Years]
1	4	1	2	4.3
1	60	1	2	4.2
25	4	1	2	4.0
25	60	1	2	2
25	60	1	4	2.3
25	60	1	8	2.5
5	4	1	24	10.4
25	4	1	24	9.0
25	4	5	24	5.4
50	4	5	24	3.6
100	4	5	24	2.1