

# LORENTZ smartTAP

Enabling sustainable water provision for everyone



**LORENTZ smartTAP is an off-grid water dispensing and management system which enables revenue collection, water entitlement and sustainable water provision.**

LORENTZ smartTAP combines hardware, software and predefined business models to allow for water infrastructure to be delivered in an economically sustainable way.

Users of the system access water from a tap using a tag. The tag is pre-

charged with water credits at a local shop or directly via mobile money.

The revenue collection function allows the system to be maintained, any investments to be returned and for the system to be expanded to more users.

**LORENTZ**   
**The Solar Water Pumping Company**

# Managing a global challenge



## Reliable access to clean water

Reliable access to clean water is still a challenge around the world. For many communities further improvements are required in order to bring reliable and clean water within easy reach of their homes.

LORENTZ smartTAP provides a way to extend water provision to the world through micro payments at point of water delivery

## Sustainable solutions

Maintaining water infrastructure requires skills, resources and organization, all of which require money. Through the revenue collection function, water systems become self-sustaining and waste is reduced.

LORENTZ smartTAP allows for water system sustainability and resource management

## Meeting local needs

How water is used in a community is as diverse as the people that are served. Technical solutions need to be designed to fit local needs, expectations, customs and culture in order to be fully accepted and integrated.

LORENTZ smartTAP works well for donors, governments, commercial operators and communities

## Inclusion and equality

Water solutions need to be accessible and support the whole of a community. Technology can assist this by providing personal entitlement to water based on specific needs such as age and gender.

LORENTZ smartTAP can be used to provide personal daily water entitlement to individuals within a community

## *The Solar Water Pumping Company*

# The LORENTZ smartTAP solution

The smartTAP solution provides the necessary technology for sustainable water solutions anywhere in the world.

The LORENTZ combination of field experience, hardware design, manufacturing for off grid environments and software development results in a solution that is reliable and flexible.

The LORENTZ smartTAP components allow for not only a single tap deployment, but also for a fully scalable multi community solution. The modular design means the system is cost effective at any size.

The system analyses and reports any problems for long lasting service. Hardware is designed to be be repairable with low skill levels and limited training. Sub unit parts are simple to replace and can even be repaired down to component level in country, making smartTAP a dependable long-term solution.

## smartTAP communicator hub

Taps can operate autonomously or as part of a connected group. The communicator allows for taps to be connected online using the local GSM network. A connected group of taps connect to one central communicator using LoRaWAN as the communicator.

## Storage tank

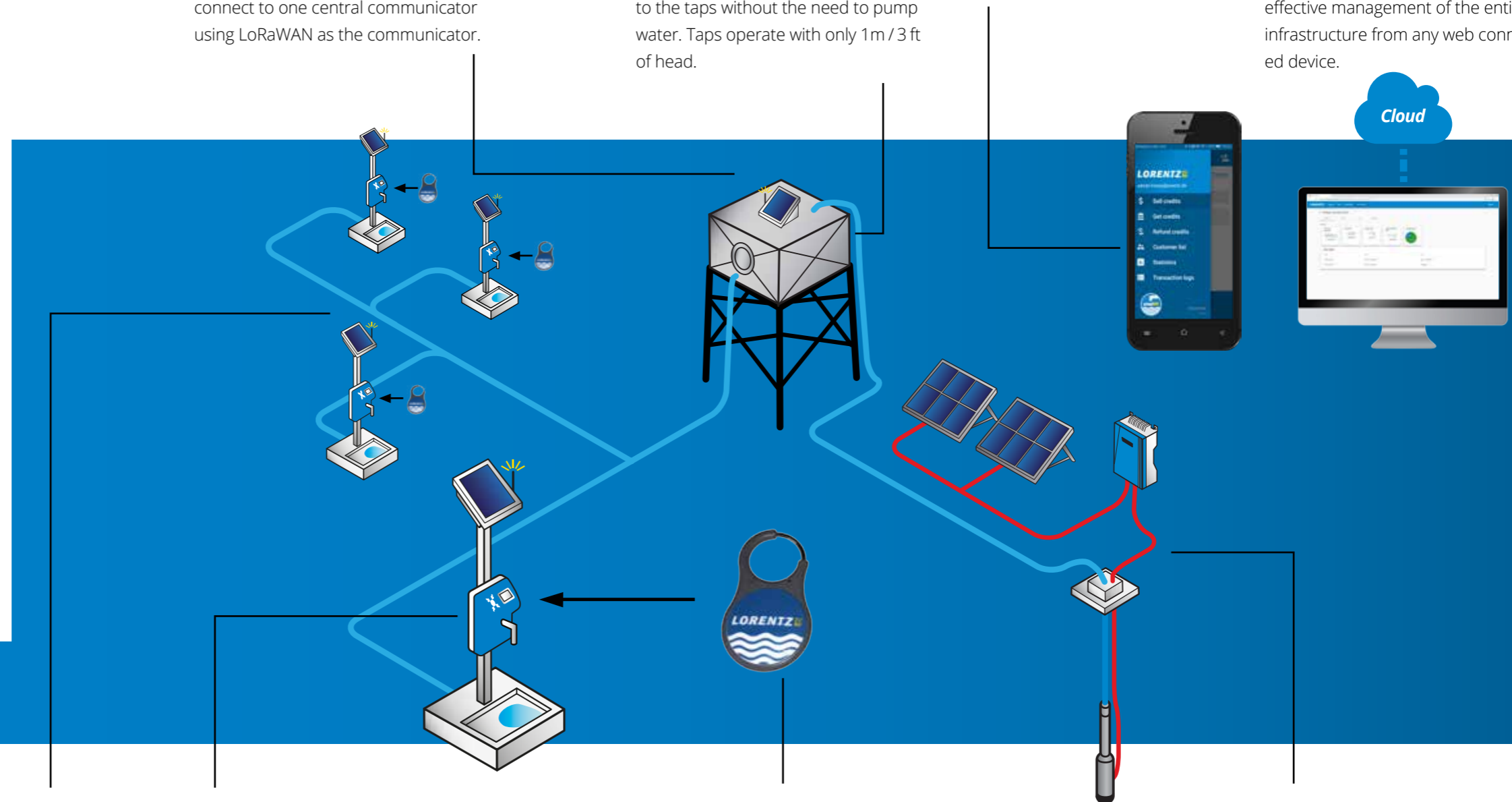
Central storage allows many taps to be served. The tank is also typically the logical point where any water treatment takes place. The elevated position of the tank provides pressure to the taps without the need to pump water. Taps operate with only 1m / 3 ft of head.

## smartTAP App

The smartTAP App is used by local water sellers to add credit to users tags. The App provides a simple point of sale service without complex and expensive infrastructure.

## LORENTZ Global

The SmartTAP solution offers a Cloud based management system where taps and water services can be managed. Technical, financial and usage information is available to allow for effective management of the entire infrastructure from any web connected device.



## Distribution network

Existing pipework can be utilized with LORENTZ smartTAP. To secure the pipework from tampering it is often run underground. The LORENTZ smartTAP water dispenser unit is secured to a post or wall.

## smartTAP water dispenser

The smartTAP water dispenser is self-contained, needs no external power and is robust to reduce the chance of damage. A simple graphical display allows users to comfortably operate it without training. Each tap serves approximately 500 people.

## LORENTZ smartTAP tag

The tag securely holds customers water credit and identification. Tags can be recharged by a local water seller or charged directly using mobile money. The water dispensers add and decrement credits.

## Pump system

LORENTZ smartTAP integrates fully with LORENTZ solar pumping systems. The smartTAP is also fully functional with any other manufacturer's pump system or existing infrastructure.

# LORENTZ smartTAP technical capabilities

## Technical description

- off-grid, self-contained water dispenser
- solar powered with battery backup
- 72 hours of operation without any sun
- inbuilt LoRa radio for networking and communication
- head unit with PV module for charging

## Internal data storage

- records up to 10 years of water transactions
- intuitive external data collection via Bluetooth

## Operating modes

### Autonomous

- completely standalone operation
- tap operates autonomously in an island mode
- credits are held on the tag
- tag charging is handled via local water seller

### Connected

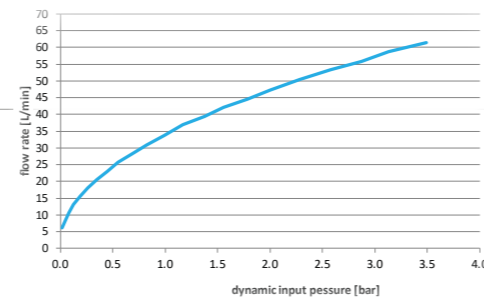
- bi-directional connection to smart-TAP communication hub for data collection and remote credit deployment
- full remote analysis and problem reporting

## smartTAP tag charging

- via local water seller with the smartTAP Android™ App (autonomous mode)
- via mobile money - collect credit at any tap (connected mode)
- hybrid of autonomous and connected modes to fit local social requirements

## Pressure requirements and delivery flow rates

- minimum 0.1 bar / 1.5 psi (1m head of water)
- minimum 100ml water delivery
- 23 l/min @ 0.5 bar (5 m / 16 ft head) – fill 20 l container in 52 seconds
- 14 l/min @ 0.2 bar (2 m / 6.5 ft head) – fill 20 l container in 85 seconds
- maximum pressure for practical use - 3 bar
- absolute maximum pressure - 10 bar



## Dimensions and weights of smartTAP body

- height 400 mm / 15.75"
- length 300 mm / 11.81"
- width 187 mm / 7.36"
- weight (dispenser) 4.8 kg
- weight (PV module and cable) 1.36 kg

## Environmental conditions

- enclosure rating IP66
- ambient operating temperature 45°C
- storage temperature -15°C to +65°C
- designed for drinking water

## Security

- robust polycarbonate case
- anti-tamper screws
- anti-tamper alarms
- high security NFC tags - MIFARE DESFire
- anti-fraud software features



## Serviceability

- internal isolation valve for service
- simple to replace hydraulic unit
- designed for technicians with low skill levels
- color-coded replacement components for simplicity
- simple valve and flow meter swap
- long life sealed battery – standard model, locally sourceable

## Usability

- LCD screen – fully graphical interface, no words
- serves low literacy users
- intuitive water dispensing and credit checking

## Mounting options

- all options are available with the standard housing
- surface mounting (wall / post)
- pole mounting
- flush mounting (in wall / in pillar)

## Connections

- external water connection – 3/4" BSP
- water deliver connection (spout) – 3/4" BSP
- solar input from head unit
- connection for external antenna if required

## Equipment

### Included

- smartTAP water dispenser
- delivery spout
- head unit with integrated 10Wp PV module and cable
- Installation manual

### Optional

- smartTAP user tags x 50
- plumbing kit
- pole mount kit
- flush mount / cast in kit

## SmartTAP hub

- LoRa communicator and 3G modem device
- FCC AU792U13A16861 approved modem
- end to end managed data service
- connect up to 50 taps per hub
- tap to hub radius minimum of 2.5km

# Software solutions

## LORENTZ SmartTAP Apps for water sellers

### Low cost infrastructure

The smartTAP App provides the infrastructure to allow local charging of water tags. The App runs on any Android smartphone that has NFC capabilities. This NFC capability is now becoming common on all mid range Android phones in the price range of \$100 (as of 2018).

### Flexible working models

Water sellers may be employed or may be agents for selling water. The water seller can be allocated water credits (1 credit = 1 litre) or they may be pre-purchased at a wholesale rate from the water operator.

### Simple operation

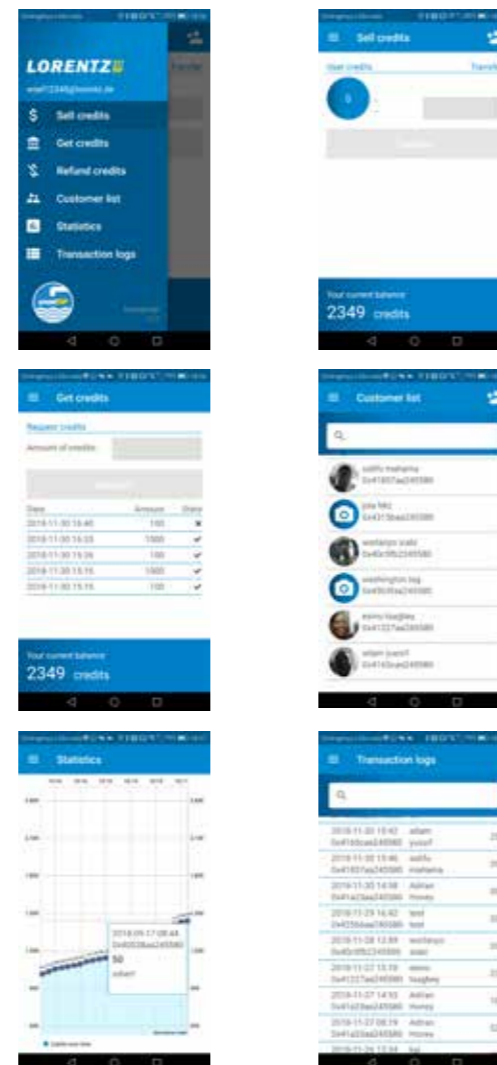
Water sellers can register new users to the system.

Water sellers can sell credits to users with a cash or local mobile money transaction and are then transferred instantly to the user's tag. This is all done without the need for network connectivity.

Water sellers can provide refunds of tags if necessary.

Water sellers can request more credits from the water operator.

All transactions are recorded and transferred to the management system when connectivity is available.



## LORENTZ Global for management

### Cloud based

LORENTZ Global is the management system for managing water dispensers and other connected LORENTZ products. LORENTZ Global requires no local IT knowledge, server infrastructure or software updates. The highest security levels possible are employed with datacentres assured to SOC 1/ISAE 3402, SOC 2, SOC 3, FISMA, DIACAP, and FedRAMP, PCI DSS Level 1 and ISO 9001, ISO 27001, ISO 27017, ISO 27018.

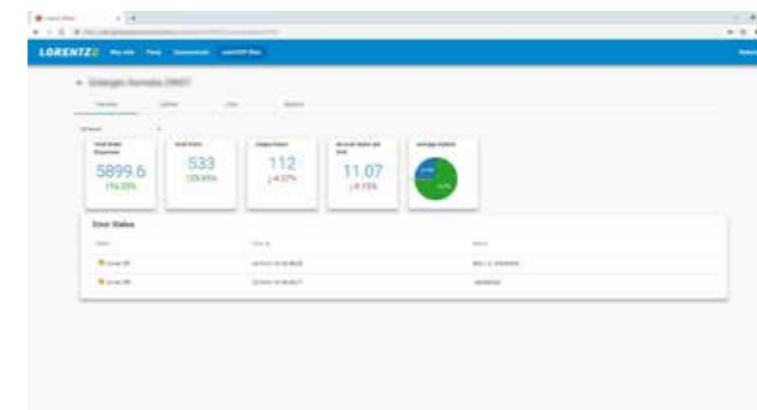
### Managing operations

LORENTZ Global records, manages and reports both technical performance of the system as well as system usage. LORENTZ Global accounts for all of the information required to operate a water scheme that is financially, environmentally and socially sustainable.

### Fits local operation models

Data can be synchronized via the smartTAP hubs for real-time data viewing or via upload from unconnected dispensers.

Simple dashboards provide information quickly and effectively.



# Sustainable water solutions



## Improved access and waste reduction

Water schemes without any accountability for use often result in unfair water distribution and waste. By using a mixture of free water entitlement, for those that need it and affordable charges for other users, water is respected and fairly distributed.

Giving water a value reduces waste and provides a mechanism to include vulnerable community members

## Cost recovery for maintenance and expansion

Economic sustainability is important to ensure that water solutions meet community needs. Without revenue for maintenance and expansion water schemes risk eventual failure.

Auditable, accountable and secure revenue collection allows for water scheme maintenance and expansion

## Energy independence

Wherever there is piped water, a LORENTZ smartTAP water dispenser can be installed.

The supplied PV module charges the internal battery and gives the dispenser autonomy from grid power or external equipment.

Sustainable water solutions using solar power

## Locally maintainable

Sustainable solutions need to be easy to maintain and repair in order to ensure longevity. The LORENTZ smartTAP water dispenser does not require any routine servicing. The innovative design means that any service requirements can be easily managed by local technicians.

LORENTZ smartTAP water dispensers are designed for simple servicing

***The Solar Water Pumping Company***

## About LORENTZ

LORENTZ is the global market leader in solar powered water pumping solutions. Founded in Germany in 1993, LORENTZ has pioneered, innovated and excelled in the engineering and manufacturing of solar powered water pumping. Today LORENTZ is active in over 150 countries through a dedicated network of professional partners. LORENTZ technology uses the power of the sun to pump water, sustaining and enhancing the life of millions of people, their livestock and crops.

Simply – **Sun. Water. Life.**



LORENTZ Germany  
Siebenstücken 24  
24558 Henstedt-Ulzburg  
Germany

☎ +49 (4193) 8806 700

LORENTZ China  
No 34 Jiuan Road  
Doudian Town  
Fangshan District  
102433 Beijing  
China

☎ + 86 (10) 6345 5327

LORENTZ US Corp  
710 S HWY 84  
Slaton, TX 79364  
USA

☎ +1 (844) LORENTZ

LORENTZ India Pvt. Ltd.  
Netaji Subhash Place  
Pitampura 110034  
New Delhi  
India

☎ + 91 (11) 4707 1009