IRIS Software Platform
Advanced metering system for PRIME technology
Introduction

*IRIS Platform* is the metering solution from Telecontrol STM. It is part of its suite of solutions for the evaluation, commissioning, maintenance and operation of metering devices networks or smart grid.

Telecontrol STM has been working with providers and vendors like Landis, ZIV, Ormazabal etc.; *IRIS Platform* integrates gateways (data concentrators) and meters from these manufacturers and it offers an unique user interface for all of them. *IRIS Platform* is a single solution to manage the entire system.

The deployment of an AMI system is complex but *IRIS Platform* is designed to simplify this process. In addition, it allows to start using the PRIME devices since you have communication with them.

*IRIS Platform* has been designed to support the WAN specifications 3.0, 3.1 and 3.1c from PRIME Alliance ([http://www.prime-alliance.org](http://www.prime-alliance.org)). This ability is currently unique in the market. In this way, we guarantee the proper functionality of the data concentrators to be installed through an internal process of certification.

*IRIS Platform* can handle from small and medium utility companies with several thousand devices to large deployments of hundreds of thousands or millions. Its architecture is distributed and scalable and therefore, the commissioning of *IRIS Platform* is made with a previous study of equipment needs in servers based on the size of the system to be installed.

Moreover, *IRIS Platform* is built with the latest technology software development (.NET framework 4.5) and its architecture is *service oriented* (SOA).

*IRIS Platform* is more than a system for implementing a metering infrastructure (AMI) and therefore is more than a simple front-end because it incorporates also functionality for operation during production time: this IRIS the productivity of the users is greatly improved.

As mentioned above, *IRIS Platform* can handle from small and medium utility companies with several thousand devices to large deployments of hundreds of thousands or millions. Whereas, some utility companies do not have support systems as a GIS, *IRIS Platform* provides additional functionality such as device location on maps, graphics network topology, ticketing system etc.

The following sections show the main pieces of the system.
Metering system deployment

In **IRIS Platform** can add gateways and meters at a time that are being installed.

To register a new gateway you only need to know its IP access, serial number and model. **IRIS Platform** has right now several data concentrators models certified by Telecontrol STM. Telecontrol STM guarantees correct operation with the rest of the system.

To register a meter manually, you just need to know its serial number. On the other hand, IRIS registers automatically all meters detected by a data concentrator.

For both devices types exist an optional field called CUPS (Universal Code Supply Point) which is used to relate the device with software system third parties (SCADA, GIS etc.).

**IRIS Platform** also has a workflow called *automatic discovering of devices* through which, once registered a gateway, the system discovers their meters that also register on **IRIS Platform** automatically, speeding up the deployment process.

Automatic deployment

In **IRIS Platform** you must to register the devices in the system for use; you can register gateways and meters manually, which is feasible for deployment of tens or some hundreds of gateways (using the feature *automatic discovery of devices*).

For a larger deployment, **IRIS Platform** can be integrated with an external system of the electric company to automate the registration.

Also, from the graphical interface is possible to register a *batch* of devices from an *xml* file with the correct information about gateways and its meters.
Device states

From **IRIS Platform** the gateways and meters can be disabled to prevent orders that are sent temporarily for some maintenance activity. Only an administrator or operator can enable or disable devices.

Devices orders

Once a gateway is registered in the system, you can send commands to it or any of its meters, for example:

- Reading of instantaneous values
- Connection / reconnection
- Manual tariff change
- Manual firmware change
- Reading historical consumption (daily or hourly)
- Maximum Power Reading
- Set of max power
- etc.

All reports of type Sxx are supported by **IRIS Platform** according to WAN specifications 3.0, 3.1 and 3.1c.
Meter connection / disconnection

With IRIS Platform you can connect and disconnect meters remotely; there is a double safety mechanism for such delicate operations:

- The user must have a special password for this operation type.
- The user receives SMS or mail with a temporary code that will allow you to perform the order.

Like the rest of actions in the system, this is recorded in the log of actions of IRIS Platform with the user who performed it.

Categorization system

Manage telemetry infrastructure with hundreds, thousands or millions devices is complex or impossible without having a mechanism for sorting or categorizing them.

IRIS Platform provides a powerful mechanism of categories and subcategories. Within one subcategory can create another subcategory, so that any organization that needs the electric company can be implemented through the system, for example:

- CT | Village | Street
- Town | CT | District | Street
- Building | Plant | Area
- Etc.

The categorization system can be created manually, exported to an XML file and imported from an XML file, the device assignment to the category can be done any time manually or through a process of integration with the electric company software.
Adquisition of daily and monthly billings

*IRIS Platform* obtains automatically the daily values which the meters generates depending of cycles scheduled of their gateways.

Reports S05 and S02 are obtained in an automatic way by *IRIS Platform* and this information will be stored in IRIS database. Thus, any user can see the billing charts of devices and export these data besides create reports with them.

It is important to point out that *IRIS Platform* is not a simple front-end of these billing messages but data billings will be stored in *IRIS Platform*'s database in a standardized way.

Programation of automatic cycles

When a gateway is registered, *IRIS Platform* can be configured to create scheduled cycles necessary to get daily and monthly billings or any type of cycle necessary. Thus, setting up of the system is easier.

On this way, as soon as a gateway is registered, it will begin to obtain daily billings automatically without action from operator.
Firmware updates

Any advanced metering system must incorporate the ability of update the firmware version of devices. This operation is complex in a system with thousands of meters and gateways and it must make in a staged way. **IRIS Platform** allows do this type of operations through its mechanism called *incremental management of programmed tasks*. These complex process is performed by Iris automatically an in a *smart* way.

System of tariffs

**IRIS Platform** can be configured to support the tariffs established of market. The tariff of a meter can be modified manually or we can create an automatic changing process, which is integrated with the software of electric company.

Getting device events

**IRIS Platform** has its own events database in order to analyze and managed them. Messages like S09, S13, S17 y S15 are obtained automatically by **IRIS Platform** and their information is stored into events database.
Alarms

In IRIS Platform are considered alarms those events which are been indicated for IRIS Platform that must be notified as soon as they are received. The operators have a special view to manage them.

Cut-off management

IRIS Platform has tables in its database in order to manage correctly all cut-offs. With this stored information, from IRIS Platform we can create reports which the operator can use it to analyze the number of incidences, time and frequency of cut-offs or power outages by one meter or group of them. This mechanism improves of electric network.

Incidences in power quality

IRIS Platform manages also the incidences of supply (power swells, surge) and this information is stored in a standardized way to Iris database for a later use. Iris users can see this information in special views and obtain reports through them. Iris users can see this information in special views and obtain reports through them.
Help to the operation

A metering system is complex to manage and operate with it unless we have a whole toolset needed for that. **IRIS Platform**, as advanced metering system, incorporates the following features:

**Control maps and network topology**

If the utility company supplies the geographic coordinates of installation (latitude and longitude of the devices), Iris can show the geolocalization of devices with **Google Maps** within user interface; with this information, the user can detect and fix PLC communication problems within the network.

![Telecontrol STM](image)

**Notes**

Any user can create notes associated to a device for indicate any important information related with it. These notes can attach files.

**Online support team**

**Telecontrol STM** offers a front line support for **IRIS Platform**. Thus, any incident or doubt of Iris users can be resolved as soon as possible with agile way. So, our customers have warranty of instant support with dedicated **Telecontrol STM**’s personal.
IRIS Platform integration with third party

*IRIS Platform* offers the integration of the most of its functionality with electric companies’ software system, for example:

- Daily billings exporting to normalized files so that can *communicate* with electric company’s billing software.
- Record of devices while deployment in an automatic way.
- Automatic sending of alarms to third party system.
- Creation and sending of custom reports.
- *Ticketing* system integration with management of electric company with its brigades of work.
- etc.

*IRIS Platform* is designed to offer a natural integration with the electric company’s software.

Gateways and firmware certification

Nowadays there are differences between manufacturers of gateway depending on the WAN version they implement (3.0, 3.1, 3.1c). These different data concentrators version are defined by Prime Alliance.

*Telecontrol STM* carries out an exhaustive process of certification to guarantee that all set deployment in field works properly and they are 100% compatible with *IRIS Platform*.

IRIS Platform security model

Security has been a fundamental piece within design of *IRIS Platform*.

*IRIS Platform* implements a set of user roles which limits the actions that a user can execute over the system. These roles are the following:

- Administrators: their users have total control in system.
- Area administrators: they have control over determined category.
- Operators: only can execute operational actions within their area.

Moreover, the final user can define new roles with different permissions enabled or disabled.
Software infrastructure deployment

In **IRIS Platform** there are the following components of its architecture:

- **IRIS Services**, set of services that allow access to any information in system, so we can work with it. It can balance and scale in more than one server.
- **IRIS Engines**, set of process (Windows services) which execute the tasks that are sent from services. It can balance and scale in more than one server.
- **IRIS UI**, user interface based on web. It can balance and scale in more than one server.
- **IRIS DB**, server where is stored the Iris database.
- **IRIS FTP**, server where is installed the FTP which receives the messages and reports of the gateways.

Due to distributed character of these components which depends to needs of **IRIS Platform** scalability for an electric company, we can define different architectures and distributions along of set of servers depends customer needs.
Examples of IRIS Platform installations
The distributed architecture of IRIS Platform allows install the system in different environment depending of these parameters:

- Number of devices
- Scalability
- Number of users
- Redundancy needs

In the following, we can see some examples of distributed installations of IRIS Platform.

No balanced installation for a system with 10,000 meters
Balanced installation for a system with 100,000 meters
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