

TELEMETRY IN RURAL MUNICIPALITIES IN THE BIERZO REGION (NORTH-WESTERN SPAIN)

Hidroconta has supplied IoT equipment for a pilot project in the municipality of Bembibre (province of León), carried out by Hidrogestión, in order to monitor domestic water consumption remotely through a web platform.

Located in the Bierzo region, in Castile and Leon, Bembibre is a town of 10,192 people. The pilot project implemented by Hidroconta focused on the nearby village of Viñales, home to 205 people. The purpose of the pilot plan was to obtain information about the impact of the digitalisation of urban water networks on the population and water use monitoring. It contemplates the provision of 147 water meters with IoT communications, as well as antennas or communications links as required for the system to work. Meter replacement and the installation of antennas or communications links have been carried out by water management company Hidrogestión, with technical support provided by Hidroconta.

Network digitalisation allows controlling domestic water use from a device connected to the network, with no need to physically go to the location and collect data in situ. Generating records and reports that help with decision making facilitates quick action concerning leak detection, monitoring domestic consumption, and calculating water balances. This enables assessing different options going forward, once you have all the information you need. All of the above translates

The Bierzo project was implemented with the company in charge of water management in the area, Hidrogestión, as a pilot project

into savings in terms of operating, management and maintenance costs.

The implementation of meters with communications will enable the visualisation of water use balances and any warnings detected by the Deméter system. Furthermore, the digitalisation project in the Bierzo region established the need to integrate the data collected into the control platform of the management company. Thanks to the interoperability of the Deméter platform, the manager can visualise the data in its commercial cycle platform, in order to facilitate the process of billing customers for their domestic water use.

The equipment supplied by Hidroconta is the Atlantis range of high-precision, single jet mechanical water meters, R160H. The Atlantis domestic use meter offers a perfect service, able to detect any potential leaks, thus avoiding further damages in dwellings.

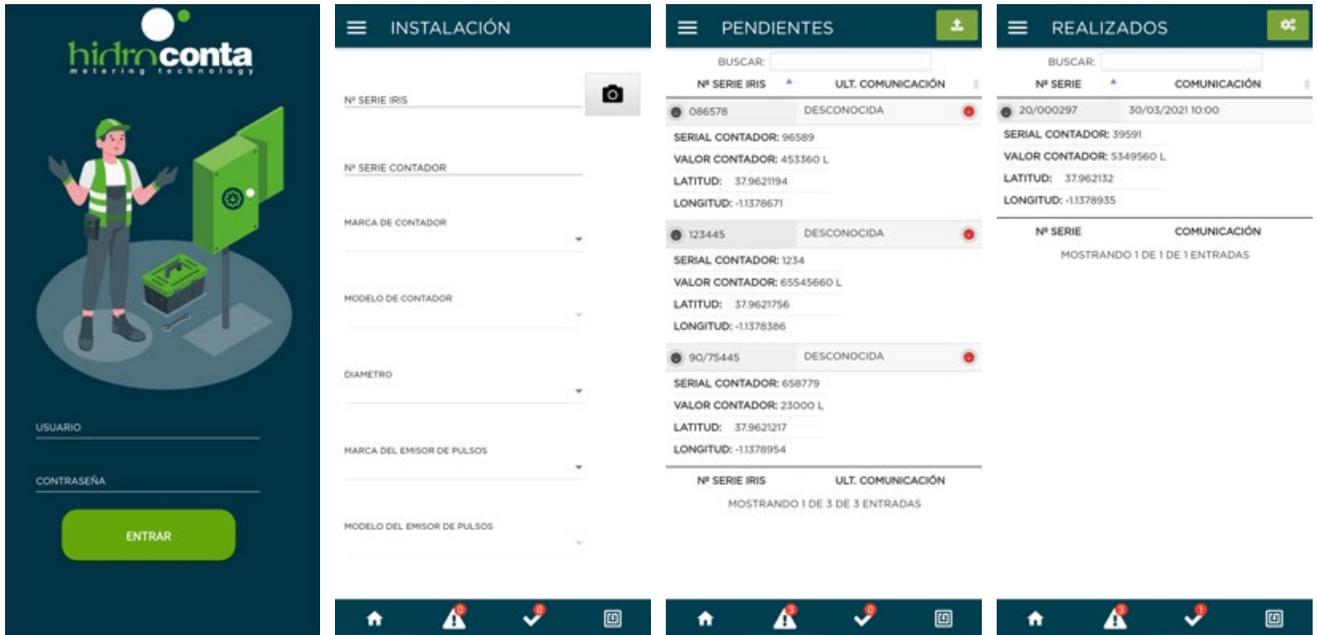
The traditional mechanical meter includes an external Iris communications module by Hidroconta, an automatic meter reading (AMR) device which, once installed in any meter, can record and send the water volumes passing through the meter. This way, the user can visualise the information in a web platform or an app in a transparent way. Furthermore, the Iris module has the capacity to send warnings based on the information obtained by the water meter: warnings about reverse flow, leaks, about the meter stopping, about the meter being undersized, about meter tampering and the battery status.

The equipment provided by Hidroconta in the Bembibre project, both water meters and telemetry devices, have inductive pickup, with the following advantages: there is no need to use emitters nor other intermediate accessories, they are able to detect reverse flow, and have been developed to impede interferences in the pulse pickup with magnets.

The equipment developed by Hidroconta has been designed so that any installer will be able to digitalise the water network by following some simple directions. In this case, the staff of Hidrogestión was in charge of installing the equipment, always with the technical support provided by Hidroconta.

Specifically, the Iris communications module by Hidroconta can be used with the mobile app Iris Installer. The application has been developed by the Hidroconta team, taking into account all the parameters required, and with a user-friendly interface. The Iris Installer app is currently available in Google Play.

The purpose of the app is to guide the installer through the device set up and its synchronisation with the web platform. Activation only requires scanning the serial number of the Iris device and filling in all the fields in the form. That way it will be registered in the system and the consumption data obtained by the meter will show up in the Deméter WEB platform. If there is no internet coverage at the time of installation, the Iris Installer app has a no-connection mode, where all the installations will be saved until there is an internet connection available.



Images from the Iris Installer application

Every digitalisation project must take into account different parameters in order to ensure equipment communications, such as coverage or the final location of the equipment. From that point, Hidroconta is in charge of setting up the terminals based on the communications technology selected in each case.

In this case, Sigfox technology was selected for the project in Viñales. After studying the coverage in the area, we established the need to install a base micro-station in the village's school, because coverage in the area was not enough for the distributed equipment to communicate optimally the infor-

mation about domestic water use recorded.

Hidroconta selected the village's school to install the micro-station based on several criteria: it should be a point with electric power, with GPRS coverage, a central location on high ground, and it should be accessible for maintenance work.

Sigfox service maps

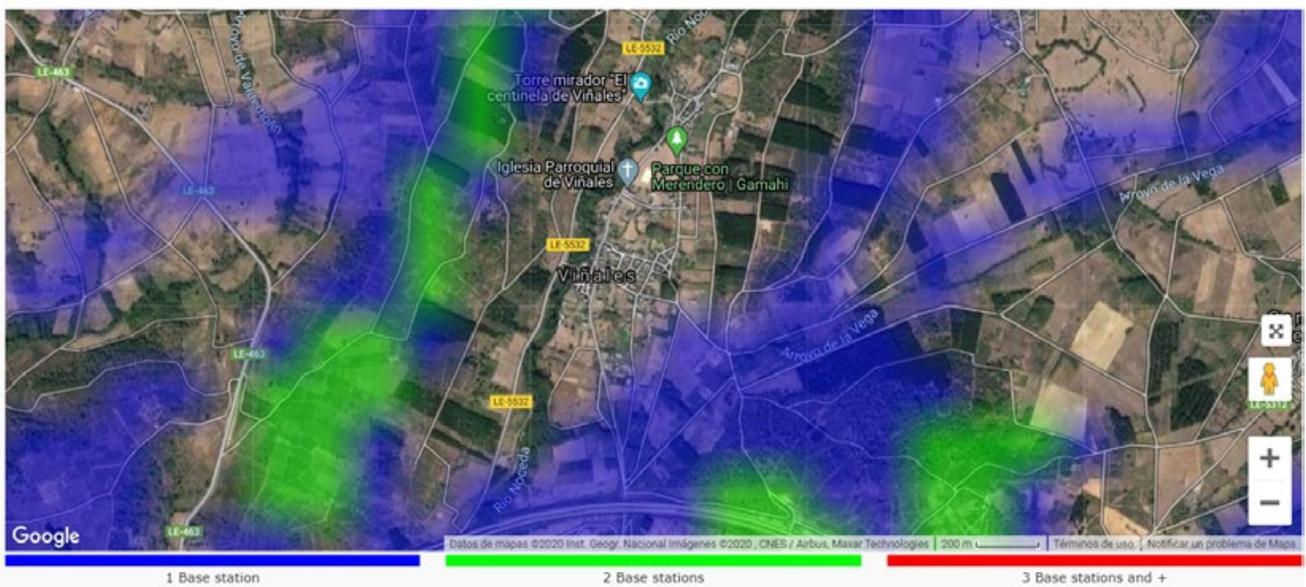


Image from the coverage study done prior to the project



Atlantic meters with Iris communications modules installed on the façade of houses

Moreover, knowing the final location of the equipment is essential for the coverage study, because it may be necessary to place communications modules at different points with a higher level of service, or to add signal repeaters to the project. In the case of the Bembibre project, meters have been installed, for the most part, in water meter boxes on the façade of the houses.

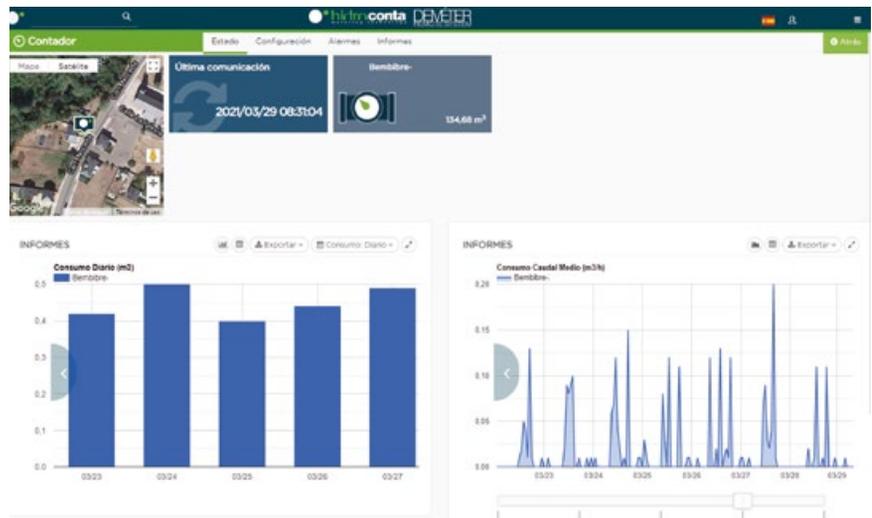
As mentioned earlier, the domestic consumption data retrieved by water meters will show up in the Deméter System Web. The Deméter Web platform is a user interface, accessible from any de-

vice with internet access, where you can visualise network data.

In the main control panel of the Deméter Web platform, you can visualise a summary of information on the selected element. It includes the location,

when did the last communication with the device take place (time and date), the battery leftover in the communications module in this case, notifications about any warnings detected by Iris, readings on the water volume used, etc.

The purpose was to gather information on the impact of water network digitalisation on the population and on water use monitoring



A terminal's control panel

Contador	Nº de serie	Nº de abonado	Abonado	Fecha Inicio	Valor Inicio	Fecha Fin	Valor Fin	Consumo
Bembibre-20/000529	19/034622	37		01/02/2021 00:00:00	2,630 m ³	01/03/2021 00:00:00	8,240 m ³	5,610 m ³
Bembibre-20/000530	19/035061	1107		01/02/2021 00:00:00	67,230 m ³	01/03/2021 00:00:00	78,090 m ³	10,860 m ³
Bembibre-20/000531	19/034628	1248		01/02/2021 03:00:00	23,680 m ³	01/03/2021 14:00:00	27,210 m ³	3,530 m ³
Bembibre-20/000532	19/035073	6459		01/02/2021 00:00:00	16,280 m ³	01/03/2021 00:00:00	16,500 m ³	0,220 m ³
Bembibre-20/000533	19/034802	30		01/02/2021 02:00:00	433,940 m ³	01/03/2021 08:00:00	436,750 m ³	2,810 m ³
Bembibre-20/000534	19/035361	6855		01/02/2021 00:00:00	2,060 m ³	01/03/2021 00:00:00	2,320 m ³	0,260 m ³
Bembibre-20/000536	19/035064	767		02/02/2021 15:00:00	94,860 m ³	01/03/2021 00:00:00	102,230 m ³	7,370 m ³
Bembibre-20/000537	19/035378	57		01/02/2021 15:00:00	0,550 m ³	01/03/2021 00:00:00	0,820 m ³	0,270 m ³
Bembibre-20/000538	19/034954	417			0,000 m ³	01/03/2021 14:00:00	14,180 m ³	14,180 m ³
Bembibre-20/000539	0				0,000 m ³		0,000 m ³	0,000 m ³
Bembibre-20/000540	19/034807	3400		01/02/2021 00:00:00	3,490 m ³	01/03/2021 00:00:00	5,900 m ³	2,410 m ³
Bembibre-20/000541	19/034801	1402		01/02/2021 00:00:00	6,190 m ³	01/03/2021 00:00:00	6,190 m ³	0,000 m ³
Bembibre-20/000542	19/035066	1113		01/02/2021 00:00:00	5,640 m ³	01/03/2021 00:00:00	5,620 m ³	-0,020 m ³
Bembibre-20/000543	19/034854	7284		01/02/2021 00:00:00	28,920 m ³	01/03/2021 00:00:00	35,810 m ³	6,890 m ³
Bembibre-20/000544	19/034803	31		01/02/2021 00:00:00	13,070 m ³	01/03/2021 00:00:00	15,810 m ³	2,740 m ³
Bembibre-20/000545	19/034814	4656		01/02/2021 00:00:00	65,960 m ³	01/03/2021 00:00:00	68,130 m ³	2,170 m ³
Bembibre-20/000546	19/034820	2279		01/02/2021 00:00:00	19,180 m ³	01/03/2021 00:00:00	21,400 m ³	2,220 m ³
Bembibre-20/000547	19/035070	5610		01/02/2021 00:00:00	3,770 m ³	01/03/2021 00:00:00	3,860 m ³	0,090 m ³
Bembibre-20/000548	19/034819	1250		01/02/2021 00:00:00	26,450 m ³	01/03/2021 00:00:00	32,200 m ³	5,750 m ³
Bembibre-20/000549	19/034812	1119		01/02/2021 00:00:00	13,450 m ³	01/03/2021 02:00:00	15,930 m ³	2,480 m ³
Bembibre-20/000550	19/034624	5166		01/02/2021 09:00:00	83,950 m ³	01/03/2021 08:00:00	98,470 m ³	14,520 m ³
Bembibre-20/000551	19/034816	3385		01/02/2021 00:00:00	30,320 m ³	01/03/2021 00:00:00	36,520 m ³	6,200 m ³
Bembibre-20/000552	19/035063	4888		01/02/2021 00:00:00	4,860 m ³	01/03/2021 00:00:00	5,200 m ³	0,340 m ³
Bembibre-20/000553	19/035079	7136			0,000 m ³	04/03/2021 09:38:09	37,120 m ³	37,120 m ³
Bembibre-20/000555	19/034946	32		01/02/2021 00:00:00	22,590 m ³	01/03/2021 00:00:00	23,770 m ³	1,180 m ³
Bembibre-20/000556	19/034856	1924		01/02/2021 00:00:00	15,390 m ³	01/03/2021 00:00:00	17,900 m ³	2,510 m ³
Bembibre-20/000557	19/034638	1186		01/02/2021 00:00:00	56,390 m ³	01/03/2021 00:00:00	65,660 m ³	9,270 m ³
Bembibre-20/000558	19/035077	38		01/02/2021 00:00:00	0,920 m ³	01/03/2021 00:00:00	0,980 m ³	0,060 m ³
Bembibre-20/000559	19/035365	4533		01/02/2021 00:00:00	32,860 m ³	01/03/2021 00:00:00	38,980 m ³	6,120 m ³
Bembibre-20/000560	19/035378	3381		01/02/2021 00:00:00	69,840 m ³	01/03/2021 00:00:00	69,840 m ³	0,000 m ³
Bembibre-20/000562	19/035078	6015		01/02/2021 00:00:00	4,330 m ³	01/03/2021 00:00:00	4,900 m ³	0,570 m ³
Bembibre-20/000563	19/034813	2673		01/02/2021 00:00:00	2,130 m ³	01/03/2021 00:00:00	2,130 m ³	0,000 m ³
Bembibre-20/000564	19/034640	2884		01/02/2021 00:00:00	38,400 m ³	01/03/2021 00:00:00	44,400 m ³	6,000 m ³

Report for system integration

The Deméter Web platform allows visualising water consumption using different types of graphs: bar graphs of consumption over time (per hour/day/month), how the average consumption has evolved, etc. With all the information collected, you can generate the reports needed to study the hydraulic system, do water balances and study trends and how performance evolves.

Deméter gives you the option of generating all the reports necessary to study the system. The reports may be visualised as graphs or tables, either in the system or be exported to your computer in Excel format. Having developed the Deméter system internally at Hidroconta ensures flexibility, so that the platform can adapt to the client's needs. In the case of the pilot project in the village of Viñales, municipality of Bembibre, the reports were adapted, linking water consumption with the customer number, in order to integrate the information with the control program of the water management com-



Hidroconta supplied 147 Atlantis single jet mechanical water meters with Iris communications modules, configured with Sigfox



pany, and thus facilitate and streamline the billing process.

A well-informed decision is always a good decision, therefore the digitalisation of urban water networks is crucial to achieving sustainable use of water resources. At Hidroconta we work towards the development of equipment to compile data, and systems to present the data in a user-friendly fashion.

The pilot project includes the integration of data on domestic consumption with the commercial cycle platform of the water company