The CIRCUTOR **PRIME PLC Concentrator** and the key to its success

What does it mean for electricity distribution companies to have a completely approved **PRIME PLC Concentrator**? Which **PRIME PLC Concentrator** has most successfully passed the independent tests of the Energy Technology Institute (**ITE**)?

In this article we will see how, in addition to having complete approval, it is essential to obtain the best results in a series of tests performed by a top independent entity like the **ITE**. These tests are also focused on the parameters of most interest to distribution companies: the concentrator should offer maximum energy meter availability, regardless of who makes the smart meters.

Why are we sure that the **CIRCUTOR** concentrator will meet all of your needs?

Because of its results in the STG-DG Test

Because **CIRCUTOR**'s **SGE-PLC1000** concentrator has been CERTIFIED by the external **DNV-GL** (**KEMA**) laboratory: **DNV-GL**'s development makes it a landmark laboratory that is widely renowned in the **PRIME Alliance**, establishing itself as the only laboratory that grants this certification.

Because for **CIRCUTOR**, reliability is a key factor: The **CIRCUTOR** concentrator was the first concentrator to pass the tests with zero errors . We offer the market the most solid and reliable unit, proven with data entirely from outside our company (**DNV-GL** (**KEMA**)).

For the results in the ITE tests

Because according to the results of the test (**ITE**), **CIRCUTOR** offers the best concentrator on the market: The **SGE-PLC1000** concentrator was recently subjected to the interoperability test (Test A) at the Energy Technology Institute (**ITE**), the purpose of which is to assess its behaviour by connecting hundreds of energy meters produced by different manufacturers to create a benchmark of the concentrators currently available on the market.

The **PRIME PLC concentrator** is completely approved

With the complete approval of the **PRIME PLC concentrator SGE-PLC1000** from **CIRCUTOR**, energy distribution companies have a unit that offers maximum reliability and safety when collecting data and managing a network of smart meters. This concentrator has achieved all of the certifications required by the **PRIME** Alliance and has passed all of the different tests specified by the different utilities.

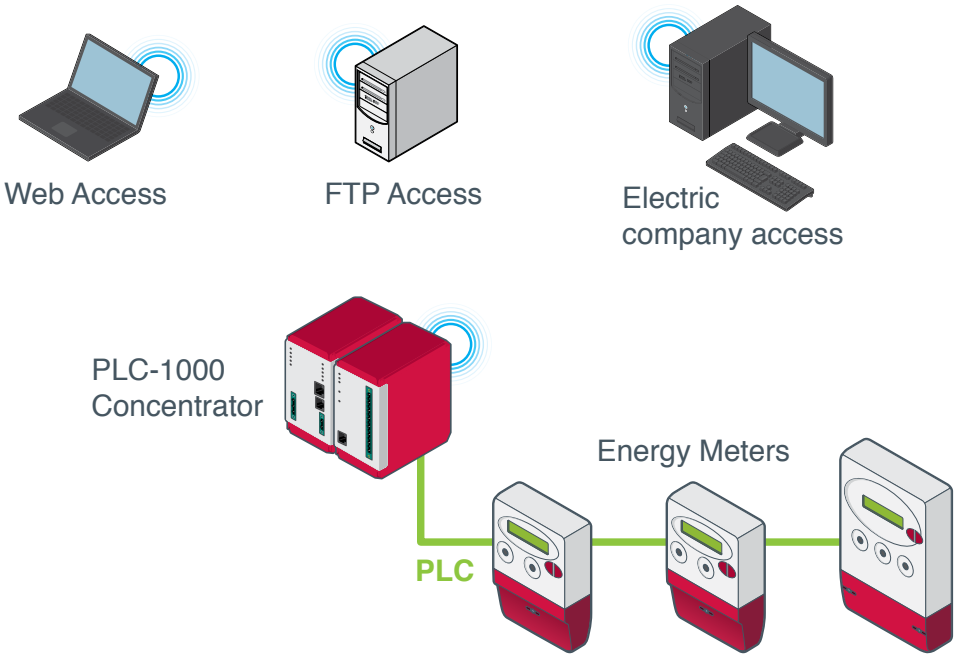
The **PRIME PLC concentrator** has passed **IBERDROLA**'s **STG-DC** conformity tests performed by **DNV-GL** (**KEMA**)

What is the STG-DC test?

The **STG-DC** is the test that ensures the implementation of the communications protocol between the concentrator and the telemanagement system (**STG**) used by a utility. The test consists of simulating utility telemanagement software, which makes a series of requests to the concentrator to examine the behaviour of the concentrator.

Concentrator interconnection with an energy meter network by **PLC** and **STG** systems

Therefore, in addition to being completely approved, **CIRCUTOR** was the first manufacturer to pass the **IBERDROLA STG-DC** conformity test for its **SGE-PLC1000** concentrator with **PRIME PLC** technology for reading and managing smart meters. After a long approval process established and standardised by **IBERDROLA**, we are proud to report that it is fully certified for **PRIME PLC** applications.



DNV·GL

KEMA
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TEST REPORT SUMMARY

E-14-I-021-AA

Issued to:

CIRCUTOR
Vial Sant Jordi, s/n.
08232 Viladecavalls (Barcelona)

For the product:

Type: Data Concentrator
Model: SGE-PLC1000
Firmware Version: 0.8.7
(configuration date: 20-12-2013)

With the implementation:

STG-DC Interface Specification v1.3.c and Functional Specification for the Data Concentrators v2 of Iberdrola,

The product has not been shown to be non-conforming to the above specifications.

Tests cases have been performed as described in STG-DC Interface Protocol and DC Functionality Test-book v1.1 for the following levels:

Data Flow	TCP/IP communication (TC) [2] WebServices (WS) FTP Servers (FS) Failed meters – Error codes (FM) [4] Version compatibility (VC) [4]	Orders (STG to Meter)	Power modification (POM) Cut-off/Reconnection (RE) [1] Contract modifications (CM) Meter firmware update (MF) Meter parameters modification (MPM)
Requests to the Concentrator	Energy Register (ER) [1], [3], [4] Meter parameters (MP) [4] Contract Definition (CD) Voltage failure reports (VF) Meter events (ME) Spontaneous meter events (SM) Concentrator events (CE) [2] Spontaneous concentrator events (SC) Intruder equipment in PLC (IE) Base Node PLC information (BN) Table of existing meters in the PLC net (TE) List of managed meters (LM)	Orders (DC into DC)	Meter Removal (MER) [4] Modification of the concentrator config (MC) [2] Concentrator Firmware update (CFU) [2] DC Order Request (DO)
		DC Functional Management	Access control (AC) Priority management (PM) [4] Memory requirement (MR) [1], [4] Scheduled tasks (ST) [4] Cycle tests (CT) Synchronization of DC time (SD) DC initialization (DI) [4]

The test campaign did not reveal any errors in the product's protocol implementation.

This test report summary is granted on account of tests made at location of KEMA Energy S.L. in Madrid, Spain and performed with STG-DC Test facility and Simulator version 1.2.2. The results, including remarks and limitations, are laid down in our complete test report enclosed in continuation.

The tests have been carried out on one single specimen of the product, submitted by Circutor. This test report does not include an assessment of the manufacturer's production. Conformity of his production with the specimen tested by KEMA Energy S.L. is not the responsibility of KEMA Energy S.L.

Madrid, February 14, 2014

E. Henríquez
Smart Grid Lab Manager, KEMA Energy S.L.

P. del Río
Test Consultant

[1] The following test-cases in this group require the setup-2, with 2000 meters, and were not part of these testings: ER-05, ER-17, RE-06 and MR-06.
[2] The following test-cases in this group are not supported by the DC: CFU-06, CFU-07 and CE-01.
[3] The following test-cases in this group require an external Supervision meter and are partially tested: ER-27 and MC-09.
[4] IMPORTANT: Remarks apply to the implementation of this function in one or more test-cases in this group. See the resulting report (Appendix-A) for full details.

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Summary of the report on the **IBERDROLA STG-DC** conformity certification test performed by **DNV-GL (KEMA)** on the **CIRCUTOR SGE-PLC1000 PRIME PLC concentrator**

Obtaining this certification for the **PRIME SGE-PLC1000** Concentrator is another step towards the standardisation and interoperability of the **PRIME** system, which is used by a great many energy distribution companies both in Spain and abroad.

The **PRIME PLC** concentrator has achieved the maximum qualification in “Test A”, performed by the **ITE**

The **ITE** test attempts to reproduce the real conditions of electrical distribution lines with energy meter centralisation, representative wiring lengths, different levels of attenuation and injection of attenuating noise.

For **CIRCUTOR**, the results achieved were truly satisfying. Specifically in the two most important categories for electrical energy distribution companies:

SGE-PLC1000 achieved an index of 100% in topology (the best benchmarking score). In other words, all of the energy meters remained permanently connected to the concentrator during the days of the test. The official results produced by the **ITE** can be seen in the table below:

Topology: Average availability (energy meters connected)= 100%

SGE PLC1000 achieved a mean availability index in the long cycle test of 98.95% (the best benchmarking score). The long cycle test continuously and repeatedly requests loading curves for the energy meters connected to the concentrator. The official results produced by the **ITE** can be seen in the table below:

Long cycles: Average availability (energy meters connected)= 98.95%

BENCHMARKING - TEST A

ITE

		DATA CONCENTRATOR				
		A	B	C	D	E
Field	Concept					
Topology	Average Availability (Working Nodes)	100				
Topology	Average 25% worst (Working Nodes)	100				
Topology	Average 5% worst (Working Nodes)	100				
Long Cycles	Average Availability (Working Nodes)	98,95				
Long Cycles	Average 25% worst (Working Nodes)	95,8				
Long Cycles	Average 5% worst (Working Nodes)	85,35				

Categoría Topología: Disponibilidad media (Contadores conectados)= 100%

Categoría Ciclos largos: Disponibilidad media (Contadores conectados)= 98,95%

Summary of comparative benchmarking of **PRIME** Concentrators showing the two most important categories for utilities (Column A: **CIRCUTOR PRIME PLC concentrator**). Irrelevant data eliminated for greater clarity.

Other certifications achieved which complete the series of tests required for the approval of the concentrator are:

— **EN-50065**, performed by the **LABEIN** certified laboratory. Referring to tests on the transmission of signals over the low voltage electrical network in the frequency band of 9-95 kHz (A **PRIME** Band).
— **PRIME** test performed by **DNV-GL** (**KEMA**). Ensures interoperability at the **PRIME** level.
— Mechanical, electrical and climatic tests performed by the **APPLUS** and **LRIC** certified laboratories.

Conclusions for distributors and utilities

To take a correct reading of the energy meter network, any distributor and electrical company must ensure that **PRIME concentrator** units have:

— Complete approval by the **PRIME Alliance**,
— the best results in a series of tests performed by a top independent entity.
— Furthermore, these tests should be focused on the parameters of most interest to distributors and utilities: maximum energy meter availability, regardless of who manufactures the smart meters.

As we have seen in this article, the **PRIME PLC Concentrator SGE-PLC1000** from **CIRCUTOR** perfectly meets these requirements.

SGE-PLC1000

Concentrator for PLC/PRIME Systems

SGE-PLC1000 is the main device of **Smart Metering** systems in **CIRCUTOR** with **PRIME** protocol. The main function of **SGE-PLC1000** is to manage the mains by **CIRWATT** electricity meters or other meters with **PRIME** technology. This data collection is performed using the power lines from the distribution network as a medium, which is known as 'PLC Communications' (Power Line Carrier). The protocol used by the PLC concentrator is the **PRIME** standard.

PRIME ALLIANCE

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eficiencia energética eléctrica electrical energy efficiency