

Custom Solutions for Complex Problems

Billing

X-Polarization Measurement System



AMPHINICY
TECHNOLOGIES

Nothing is Impossible.®

All-round Satellite Solution Experts

- Amphinicy Technologies is in the business of designing and developing **all sized** solutions specific for satellite communication systems. From small GUIs to large enterprise solutions, throughout last **15 years**, we've done it all!
- The world leaders in the satellite communication expect nothing but the **highest** industry standards from their partners. They enjoy this level of cooperation with us! You can expect nothing less.
- Due to our **flexible** internal organization, we are able to quickly mobilize whenever our clients approach us with their needs. For example, when the creators of one of the largest satellite communication systems in the world needed to integrate a billing solution, the project was rolling **within days**.
- Our experience, lessons-learned and know-how are **priceless**. And we look forward to sharing all of them with you!

Take a look...

...at what we are capable of delivering,
perhaps you have similar needs ...

These projects are prime examples of how we're able to quickly jump into complex system requirements and produce a premium solution.

X-Pol System

QUICK FACTS

- Ground station add-on for satellite communication platforms with **any** number of terminals
- Highly optimized and scalable measurement process
- Support during the SIT/VSAT provisioning phase
- Self calibration procedure included
- Accessible via SOAP interfaces and over a very user friendly GUI for operators

Already in production in
**SES Astra's
Astra2Connect system**

DESCRIPTION

*Are you loosing **revenue** to x-pol interference? Wouldn't it be great if you could quickly identify terminals wasting **valuable** satellite bandwidth?*

It's precisely these terminals that are identified by the X-Pol system. The system is armed with fully redundant RF measurement instruments, which it uses to maximum efficiency. This allows for measuring terminals' cross polarization interference at an extreme rate. Measurements can be scheduled individually or by policies. The whole system can be controlled by its SOAP interface or its flashy FLEX GUI, both of which are fully secured via user accounts. The system is very robust, alerting users about all kinds of events, alarms and trends.

HIGH PERFORMANCE

*But we have hundreds of thousands of users to measure. How many **expensive** spectrum analyzers are we going to need, 100? ...No, not really, just 1.*

The X-Pol system's measurement dispatching capabilities meet these requirements. Measurements are broken down into independent sub tasks which are then scheduled and executed as **concurrent** as possible, while respecting each other's resource usage (satellite bandwidth, RF instruments, etc.).

The result is being able to perform hundreds of thousands of measurements with a **minimal investment** of satellite bandwidth and RF equipment.

AUTONOMOUS

*Let's go for lunch... Sorry can't, I still have tons of measurements to **schedule**... Wait, don't you know that can be done **automatically**.*

Automatic **bulk measurement scheduling** is possible via **policies**. Specific groups of terminals can be targeted by using filters. Policies can be time driven (e.g. recurring) or listen to and react to events generated by the communication platform.

Self-reliance doesn't stop here. When measuring 24/7, various reference values that measurement algorithms depend on tend to drift. The X-Pol system is immune to this thanks to its **automatic recalibration**. Frequency drifts and gain changes are all automatically compensated.

X-Pol System

EASY INTEGRATION

We're integrating the X-Pol system today! Looks like it's time to make a big pot of coffee, or is it?

The X-Pol system was designed for easy integration from the very beginning, keeping the amount of customization and adaptation at a minimum.

X-Pol System Adaptations

- All interfaces to the external communication platform are generalized into **abstract drivers**. Integration therefore only requires custom driver development, leaving the tested and proven X-Pol core untouched.
- Do you already have your own RF instruments? No problem, the same plug-in logic applies. X-Pol makes use of its own personal **measurement server**, only requiring custom instrument drivers for integration.

Your Platform Adaptations

Integrating with the X-Pol system is equally easy. All the X-Pol's functionality is available through its technology and language independent **SOAP** interfaces:

- **System configuration** - configure all vital system settings.
- **Measurement scheduling** - schedule, reschedule and cancel single or bulk measurements. Retrieve results.
- **Security** - manages user accounts for accessing to the system.
- **Monitoring** - viewing events, alarms and trending.

FRIENDLY GUI

*I'm tired of monotone tree-views and tables. I want an **attractive web-based GUI** that's simple to use yet powerful.*

The X-Pol system addresses these issues with an elegant web-based GUI implemented using Adobe Flex. This solution offers a compelling and **visually attractive GUI**, while still keeping things **simple and user-friendly**. The GUI communicates with the X-Pol system via SOAP, which is transported over HTTP, meaning there aren't any firewall or other similar network issues to worry about.

In addition to viewing measurement results, trending and other X-Pol specific information, the GUI also presents the status of the X-Pol system's integration with the communication platform. This part of the GUI is customized to present this integration in a way familiar to the platform's operators. This creates a better and more **intuitive** representation.

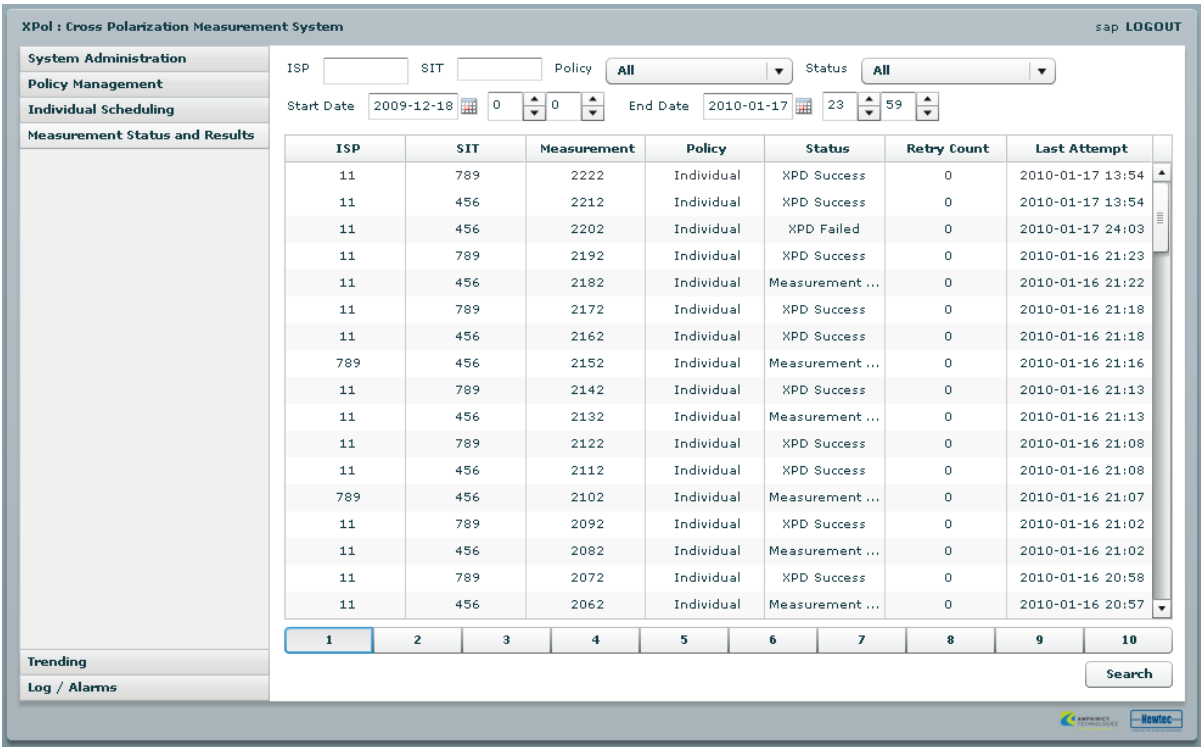


Figure 1 - X-Pol Measurement Results Example.

X-Pol System

RELIABILITY

When the X-Pol system starts measuring x-pol interference, it doesn't stop. **No matter what!**

This is achieved using a **redundant setup**. All aspects of the system can be redundant: the application itself, database and/or all measurement equipment.

The system informs operators when a piece of equipment fails and a failover occurs, so the problem can be immediately addressed.

EASY TROUBLESHOOTING

Don't you just **hate spending hours** troubleshooting issues?

Problems always happen and are impossible to avoid. It's important to be able to quickly identify their root cause and solve them. X-Pol aids in this by offering a large **variety of logs, events/alerts and trending**. These alarms are retrievable through the SOAP interface, viewable in the GUI and can be logged to a configurable external syslog service. Typical events that are logged are:

- Configuration changes,
- Measurement scheduling, canceling, etc.
- Platform communication failure,
- Internal failure,
- Equipment failure.

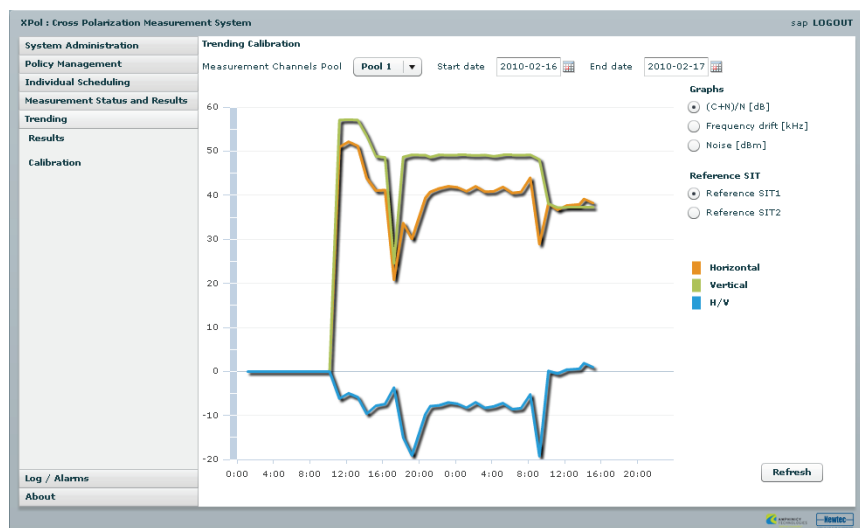


Figure 2 - Trending Example.

Billing

QUICK FACTS

- ➔ Based on jBilling, a proven open-source billing solution
- ➔ Complete solution with record mediation and invoice generation
- ➔ IP Value Added Services billing
- ➔ Web-based GUI
- ➔ Rule driven record rating (DROOLS)
- ➔ Customizable reporting
- ➔ Full and partial billing data backup support

In production for more than a year on **Newtec's MENOS system** for the Arab States Broadcasting Union

DESCRIPTION

*Do you have a **small/medium** telecom business? Are you interested in integrating a billing system but don't know where to start? **Well, we do!***

We've developed a billing system based on jBilling for one of our clients. The solution was **tailor made** to satisfy all their requirements. Seeing how it's being used for one of the world's largest satellite communication platforms, it's no joke.

Our solution is founded on Java2 EE and runs on JBoss. The most **prominent features** are record rating using user-readable business rules, complete integration with the surrounding system, basic yet informative reporting and invoicing.

Billing

BASED ON PROVEN TECHNOLOGY

Open-Source Enterprise **Gurus!**

When developing open source enterprise solutions, there's no better approach than using the rock solid **J2EE or Spring**. When developing open source billing solutions, there is really only one option, jBilling. We have great experience and knowledge in all these technologies.

WEB-BASED GUI

Need to **add/remove** billable services? Or even change the invoicing cycle? It's **all configurable** by a Web-GUI!

The billing system is entirely configurable using its web interface. This means you don't have to locally log into a machine in the basement to add a new service, you can do it from your office. It doesn't stop with services; customer information, system configuration, reporting, etc. It's all accessible by the web.

COMPLETE INTEGRATION

*I've already **re-entered** 150 customers' information into our new billing system, which makes me... only half way done. Why isn't this **automatic**?*

We aim for **complete integration**. Our billing solution retrieves all billing dependant information (e.g. customer info) from the surrounding systems. This data and other events are generally pushed to the billing system. When this isn't the case, a pull-model is used.

Similarly, it **doesn't matter** what format the service usage comes in (CDR, UDR, etc.), or which protocol they're transported by (SOAP, Hessian, FTP, flat file), they will all be **normalized** to a format understandable by the billing system.

FLEXIBLE RECORD RATING

*Do you have a **great idea** for a new service plan? Don't worry, creating new rating rules is a **breeze**.*

Pricing formulas constantly change. It's extremely important to be able to quickly and effortlessly modify them. **DROOLS** (JBoss Rules) provide this functionality. All record rating logic is implemented using **powerful yet simple** business rules. Keeping them out of the main source tree, means they can be updated on the fly as their modification doesn't require any recompiling.

| | |
|-----------|--|
| WHEN | User is not a member <input type="checkbox"/> |
| THEN | Increase price by <input type="text" value="50"/> percent <input type="checkbox"/> |
| (options) | dialect <input type="text" value="java"/> <input type="checkbox"/> |
| | <input type="text" value="javalib"/> <input type="checkbox"/> |

Figure 3 - Record Rating Rule Example

Billing

REPORTING

No complicated filters, no confusing questions, just **quick and relevant** information.

Getting a **prompt and informative overview** on billing information is vital for planning future service packages, costs, revenue assurance etc. Our billing solution has completely customized reporting capabilities. Here's an example of reports we're used to:

- Detailed service usage per user,
- Detailed service usage,
- Aggregate service usage per user,
- Aggregate service usage,
- Date filters,
- Filtering out service usage in specific states (invalid, suspicious, etc.),
- Any combinations of the above.

The screenshot shows the MENOS reporting interface. At the top, there are navigation tabs: Reports, System, Users, Accounts, Services, Invoices, and Maintenance. Below these, there are sub-tabs: Detailed records and Billing period. The main content area is titled 'REPORT - RESULTS' and includes a 'Logout' button. The results are displayed in a table with the following data:

| direction | high priority traffic vol. | price | S3P terminal id | time stamp |
|-----------|----------------------------|---------|-----------------|------------------|
| FWD | 10,5 MB | \$ 0,00 | 2 | 16.02.2009 03:38 |
| FWD | 10,5 MB | \$ 0,00 | 4 | 16.02.2009 03:38 |
| FWD | 0 B | \$ 0,00 | 6 | 16.02.2009 03:38 |
| FWD | 10,5 MB | \$ 0,00 | 9 | 17.02.2009 03:38 |
| FWD | 10,5 MB | \$ 0,00 | 10 | 16.02.2009 03:38 |
| FWD | 10,5 MB | \$ 0,00 | 11 | 17.02.2009 03:38 |
| FWD | 10,5 MB | \$ 0,00 | 12 | 16.02.2009 03:38 |
| FWD | 0 B | \$ 0,00 | 14 | 16.02.2009 03:38 |
| FWD | 0 B | \$ 0,00 | 16 | 17.02.2009 03:38 |
| FWD | 10,5 MB | \$ 0,00 | 17 | 17.02.2009 03:38 |

Below the table, there is a 'download' link and a pagination control showing 'First 2 3 4 5 6 7 8 9 ... Last'.

Figure 4 - Reporting Example

CRM

*Need us to integrate the billing system with your **CRM**? What, **you don't have one!** Don't worry, we can help.*

CRM just happens to be one of our **core** competencies. We've been customizing the open-source **SugarCRM** for the world's largest satellite operator for years.

So if anyone has the knowhow on integrating jBilling with SugarCRM, it's us!

MAINTENANCE

*Is a customer complaining about an **archaic** invoice? No problem, just import the billing data from that time and **check** to see what the issue is.*

Keeping a historical archive of billing data is a must. Our billing solution can perform **full and partial data backups**. Furthermore, these backups can be scheduled at regular intervals. If the system fails, importing the historical data into a scratched system is easy. Scripts are also provided to easily store the backups to removable media.

Billing

INVOICING

*Should invoices be generated in CSV, PDF or another format, should they be printed out or e-mailed? It's all **customizable** with our billing solution.*

At the end of the day, it's all about getting invoices to customers. **Jasper** is used for generating invoices, so naturally the invoice design and output format is **very flexible**.

Integration with larger invoicing systems is also possible. Just export the invoices in CSV format and import them into the external system.

To recap...

The solutions just covered were developed to satisfy the actual needs of **leading companies** in the satellite business.

They are **great examples** of our responsiveness, knowledge and ability to deliver real world solutions.

It's great when you know that you have a software partner that will never let you down. Letting us worry about the SW lets you concentrate on what your company does best.



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