

# ADVANCE-GRP[AMR] System

## ■ AMR SYSTEM

SCAME, always focused on innovation and technological research, has developed a smart system called **AMR SYSTEM** (Automated Meter Reading), to apply to its products. The SCAME products equipped with this smart system are the ADV GRP interlocked sockets and the DOMINO switch panels with two and four sockets.

A smart system features technology through which it is able to control and manage, on its own and in remote, industrial electrical systems aimed at improving the user's service.

In addition to being an effective solution for preventing failures and quickly resolving them, remote management systems are also a valid instrument for cost containment and for system monitoring and control.

This system is equipped with an extremely versatile and accurate energy analyser with microprocessor, designed to meet the needs of the most advanced applications for the monitoring of electrical parameters and for the management of energy consumption, allowing real-time reading via the Internet of all acquisition data and threshold management in automatic mode; moreover, it is possible to send, by e-mail, local alarms pertaining to anomalies or control of the status of manoeuvring switch and inserted plug.

The system is preset for load management. Preventing overload risks is important in order to avoid the tripping of circuit breakers and consequently the resulting malfunction (partial or total power failure), and to significantly reducing energy costs.

In fact, as everyone knows, exceeding certain limits and parameters pertaining to the supply of electricity agreed upon with the grid operator results in the application of penalties or higher rates.

## ■ DATA ACQUISITION AND MONITORING FROM A SINGLE POINT

The AMR system allows the management and monitoring of loads from a single "socket" point, ensuring the highest functionality, reliability and operating potential, in addition to simplifying installation.

In this case, the interlocked socket carries out a "multi-service", supplying electricity for proper operation to the connected load, at the same time performing monitoring and management functions.

This is a huge advantage in terms of installation costs and times.

- All energy-related data can be detected using a single card
- The card is located inside the socket
- No wiring required. Significant savings as far as time and materials are concerned.
- Accuracy class: 1% current/voltage, 1.5% power/energy
- Local and remote control with alarm and/or signalling of manoeuvre status and inserted plug

Therefore, it will be possible to automatically disable or reinstate devices or loads connected to the ADV GRP AMR socket.

The various functions include the sending of commands. Commands can be sent to a single socket or to a group of sockets, in both local or remote mode. In the latter case, an Internet connection is required.

Lastly, it allows the Energy Manager to be informed in real time on the condition of the system through any device capable of displaying a web page.

Therefore, the product can be used to diagnose, command, control and manage remote units towards a central server through specific communication protocols. The system consists of one or more sockets and management software.

In order for the two parts to communicate one with the other, a basic communication infrastructure needs to be set up. The communication channels can be RS485, Canbus and wireless. The main carrier is the Wi-Fi.

In case the Wi-Fi connection is not working, the **AMR SYSTEM** can store processing reports in a circular buffer for over a month. Once communication is restored, it sends the stored data to the management software.

The system fitted to the GRP and DOMINO sockets is suited for applications on all kinds of electric grids, 3 and 4-wire three-phase, single-phase, low and medium voltage.

All operating parameters can be set through the software, including the input and output, the alarms, the Canbus/RS485 port.

The digital input is typically used as a status indicator for inserted plug and as an ON/OFF manoeuvre selector, as well as for earth presence signalling purposes.

- Control with the signalling of anomalies and system status on the socket through a warning light
- Warning light on the socket for no earth
- Through the socket, the SCAME system can monitor refrigerated containers; however it is not designed for controlling the temperature inside the containers
- The SCAME system does not carry out checks other than electricity-related ones.

The products fitted with the AMR system (from the acronym **AMR "automated meter reading"**) feature advanced technology.

Through the AMR system, you can analyse the power grid for current and power consumption, as well as read all acquisition data in real time via the Internet;

## ■ PRODUCT RANGE – AMR SYSTEM



**ADVANCE-GRP Series**



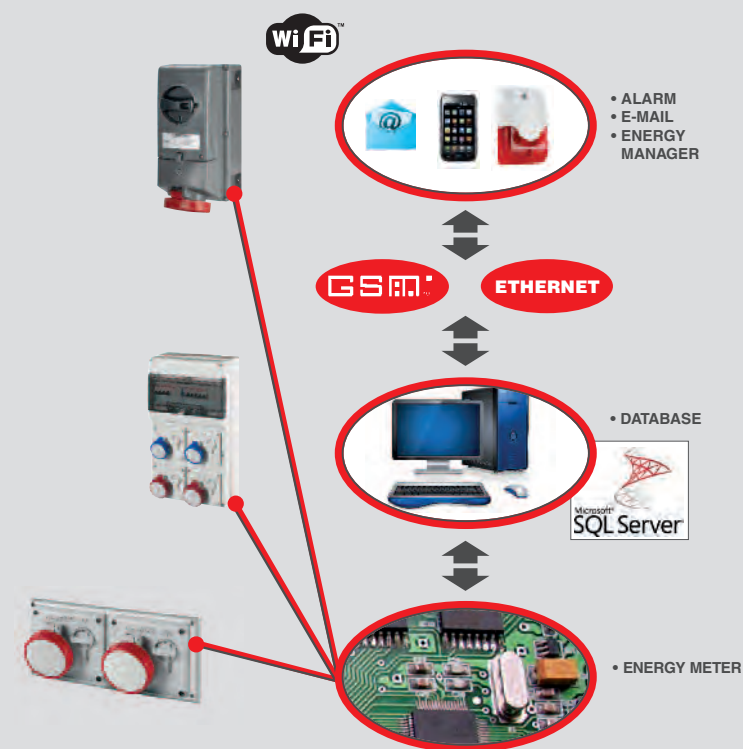
**DOMINO Series**



**OMNIA Series**

### Available functions

- Socket monitoring
- Monitoring of consumption
- Fuse check
- Internal temperature
- Plug presence
- Earth presence
- Energy management
- Data collection
- Graphs
- Alarms
- Reports
- Remote control
- Load management
- Notifications by e-mail
- Text messages (optional)



## MANAGEMENT SOFTWARE

The system is also preset for communicating in local mode with other AMR devices through RS485 or Canbus channels (optional), while it communicates with the data collection server through a Wi-Fi connection.

The computer assigned the task of monitoring the devices, process their status and retaining it for a defined time period, issues notices in case of anomalous operating conditions. Through the sampling of energy data, the system is also able to process information on the energy and consumption profile as well as represent data in graph form.

The software can be structured according to the customer's needs. The system can carry out quality measurements, make decisions on its own and inform the Energy Manager in real time with regards to the system status.

It is also possible to **monitor** energy parameters so as to avoid penalties applied for a low COS-FI (power factor).

**Eliminate waste** by checking motors, lighting, heating, air-conditioning, compressors, refrigerators, transformers, distribution lines and other utilities.



## FIELDS OF APPLICATION

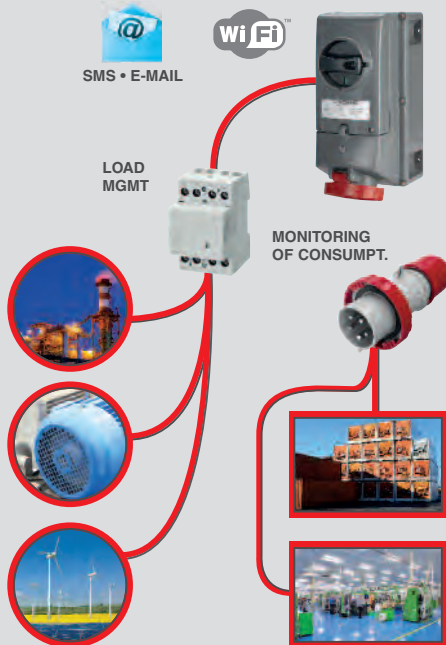
There are various application fields, from terminal containers to the shipyard sector to heavy industry. Below are a few tables that list some application examples and the requested product type.

### TERMINAL CONTAINER

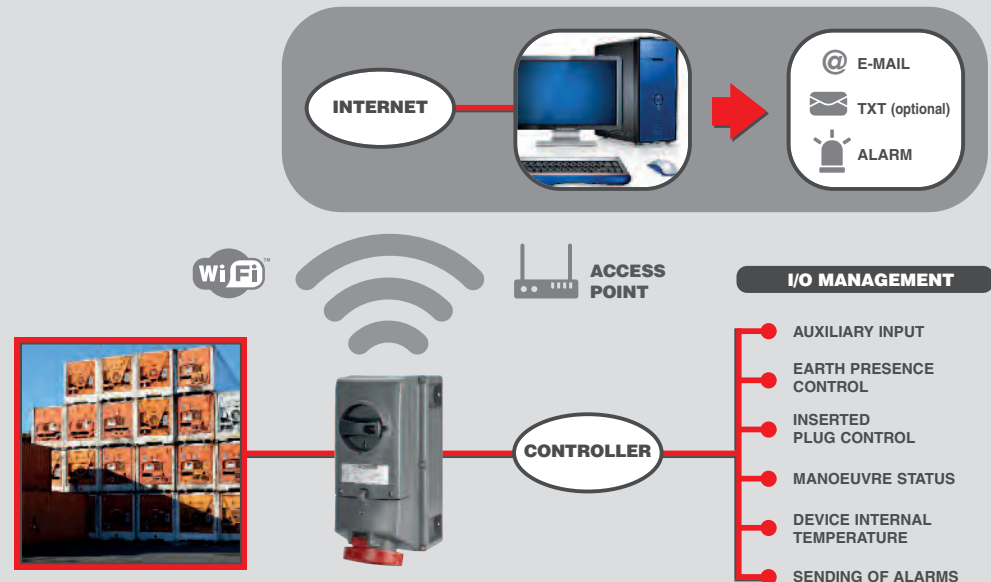
Application	Decision maker	Product type	Problems	Suggested solution	Benefits
Reefer towers	Maintenance Manager	interlocked sockets 32A 3P+E 3H	Frequent failures and tripping of protections with possible/probable loss or deterioration of the reefer load	AMR system I/O	Real-time monitoring of failures and tripping of protections with alarm systems to the maintenance managers in order to implement the necessary operations
Energy management	Energy Manager	interlocked sockets 32A 3P+E 3H energy meter on transformer cabin	Uncontrolled consumption, with major waste due to the use of old reefers with high consumption	AMR system EM	Knowledge of exact consumption at the single socket level. Possibility to check anomalous consumption and modulate the service fees in addition to the incidence of consumption due to improper use
Container handling	Maintenance Manager	interlocked sockets 32A 3P+E 3H	Handling of the container with the plug inserted and consequent breaking of sockets and structures	AMR system I/O with relay output	Possibility to combine relay outputs and aux. contacts to acoustic or visual devices to provide consent to the handling

### A few good reasons for choosing the AMR system

- **Small investment** that yields significant benefits at a reasonable cost.
- **Simple to install** and to manage, at the same time ensuring reliable performance.
- **User interface that is simple to use**, also suited for users with no prior experience.
- **Networked installation**, in order to share information and improve communication.
- **Flexible**, quick start-up and installation, with no additional installations required.
- **Improved service** to the system, thus reducing the number of failures and downtime.
- **More integrated functions** in a single instrument that can be used to both manage maintenance jobs and to control the systems quickly and directly.
- **It provides useful information**, constantly populating a database in order to subsequently carry out statistical analyses.
- **It handles emergencies** quickly and effectively, sending anomaly notices to the Energy Manager.
- **It cuts operator involvement down to a minimum.**
- **It oversees the processes**, with constant control of the systems being managed.



### EXAMPLE OF CONTAINER TERMINAL APPLICATIONS



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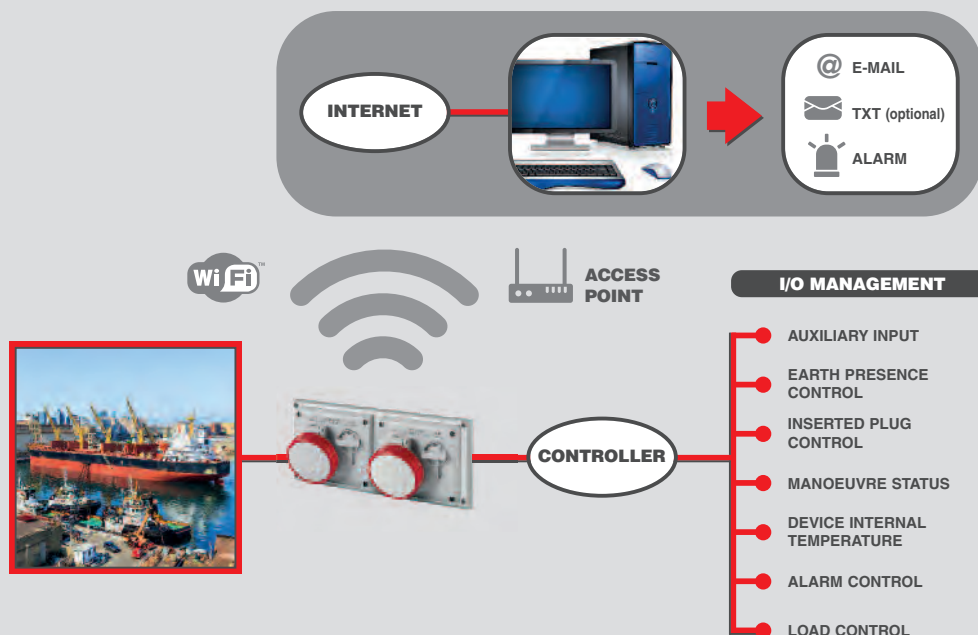
## SHIPYARD

Application	Decision maker	Product type	Problems	Suggested solution	Benefits
Worksite driving force units	Maintenance Manager	Groups of interlocked sockets	Long maintenance jobs and downtimes	I/O AMR system	Targeted management and scheduling of maintenance jobs, with consequent reduction of maintenance times and costs
External companies' equipment	Energy Manager	Groups of interlocked sockets	Waste due to improper use and management of the power supply	EM AMR system with relay outputs	Possibility for exact control of the consumptions of the individual sockets matched to the container or to external companies' equipment and possibility to manage and turn off unnecessary power supplies
Suction and lighting system in a water basin	Systems Manager	Power supply sockets or plugs to the equipment	Both suction and temporary lighting systems stay turned on even when no one is operating on board	I/O AMR system with relay output	The Manager is guaranteed that this type of equipment with high consumption work only when truly necessary, so as to be able to manage their proper operation in remote as well.

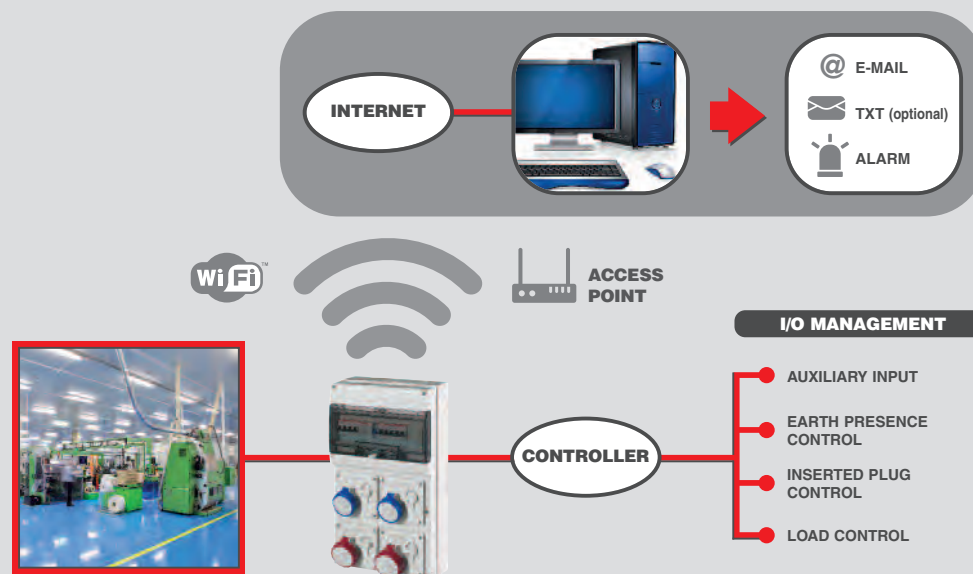
## INDUSTRY

Application	Decision maker	Product type	Problems	Suggested solution	Benefits
Worksite driving force units	Maintenance Manager	Groups of interlocked sockets	Long maintenance jobs and downtimes	AMR system I/O	Targeted management and scheduling of maintenance jobs, with consequent reduction of maintenance times and costs
Large machinery and production plants	Energy Manager	Interlocked sockets	Uncontrolled machinery consumption and failure to check for proper operation of the loads (machinery) connected to the interlocked sockets	AMR system EM	Possibility for exact control over energy consumption and Efficiency, as well as checking the consumption log
Process management	Methods Manager	Interlocked sockets	Poor machinery utilisation management and poor work distribution	AMR system EM	The Methods Manager can check the absorption/utilisation of the machinery in order to make the production processes more efficient

## SHIPYARD APPLICATION



## INDUSTRY APPLICATION



## LOAD MANAGEMENT AND REMOTE CONTROLS

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## CALENDAR FUNCTION

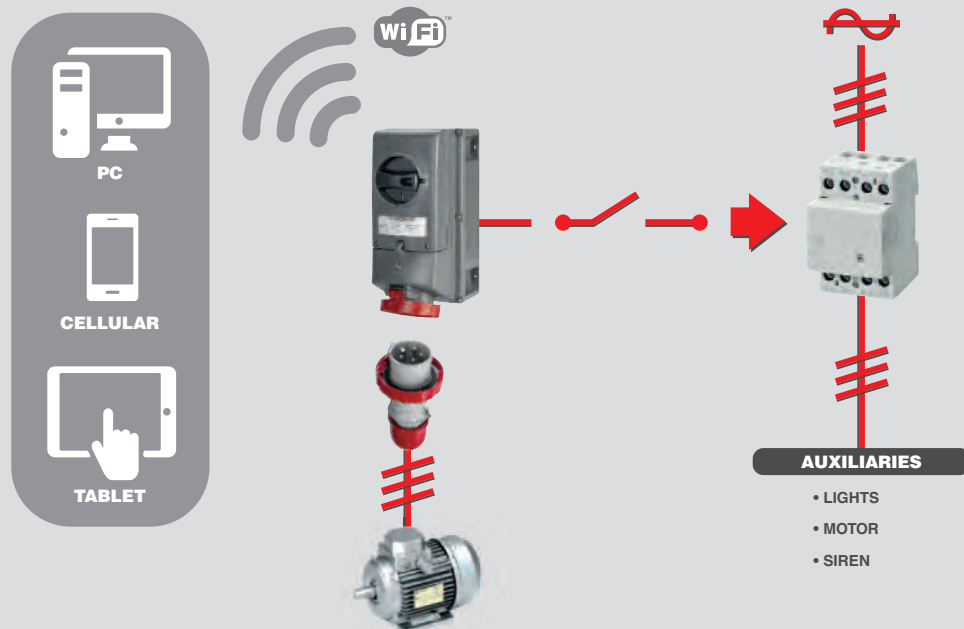
Through the calendar function, the user can program certain rules to activate/deactivate at an established date and time.

For example, deactivating the load connected to the socket, setting the day and time.

## EXAMPLE

The example below shows an application in which the load applied to the socket is a motor. In case the AMR control and monitoring system detects a malfunction of the motor or the

socket itself, it pilots an external relay/contactator, through a contact output (NO/NC), that starts a failure signalling siren or flashing light.



## EXAMPLE: CONTROL OF LOAD CONNECTED TO THE SOCKET

With this installation, the motor can be piloted by the socket through the contact output (NO/NC) of the AMR system which, in turn, pilots an external relay to which the motor is connected.

This way, the motor can deactivated/activated depending on

special events that have occurred, such as alarms, failures or simply to cut down on electricity consumption.

Moreover, this configuration allows the user to interact with the socket, activating/deactivating the motor in local or remote mode (through the web).

