i-EM
Intelligence in Energy Managemen

EController
Remote Supervision & Energy Management

PREDICO
Photovoltaic Predictive Maintenance Service

The predictive maintenance is a real-time service able to continuously monitor the current status of the plant and perform the real-time failure prediction.

The i-EM's predictive maintenance system PREDICO is able to predict inverter faults status before they actually occur, allowing the customer to take actions to reduce plant under performances.

Key Features

>> Event Detection - prediction of inverter deviations from nominal behavior
>> Advanced Fault Recognition - prediction of a specic class of faults

Key Benefits

>> Keep optimal performances of PV plants over time
>> Avoid Loss production period
>> Allow efficient O&M procedure planning

www.i-em.eu

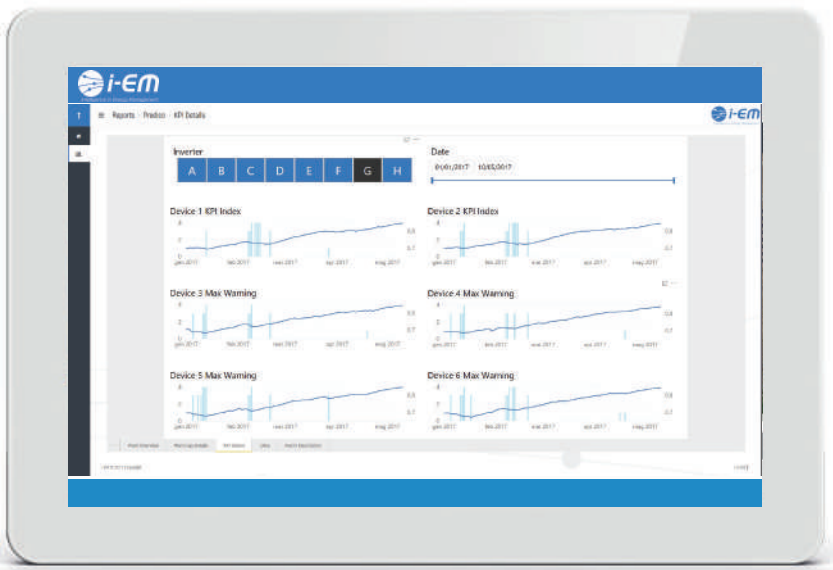
Service Description

The i-EM's predictive maintenance service is based on efficient combination of advanced Artificial Intelligence algorithms.

OUTPUT INTERFACE

A user-friendly and effective visualization tool, ideal for the operator real-time activities.
The main outputs are

>> Different warning levels (green, yellow, orange and red) corresponding to 4 different inverter fault severities
>> Quality Index trend warning time-evolution and corresponding inverter errors
>> Fault class and severity of the inverter alarm
>> Action - to - Solve (if available from inverter manufacturer)



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Added value to Photovoltaic Plant data

The Big Data i-EM's IT infrastructure allows to ingest and manipulate large and heterogeneous set of data from customer's PV plant. The Super vision model and the Fault Recognition Model are trained exploiting different information (inverter, environmental, historical data on maintenance, plant information).

SCADA data

>> Inverter data (AC&DC power, current, voltage

>> On-site sensor data (temperature, irradiance)

Historical data on maintenance

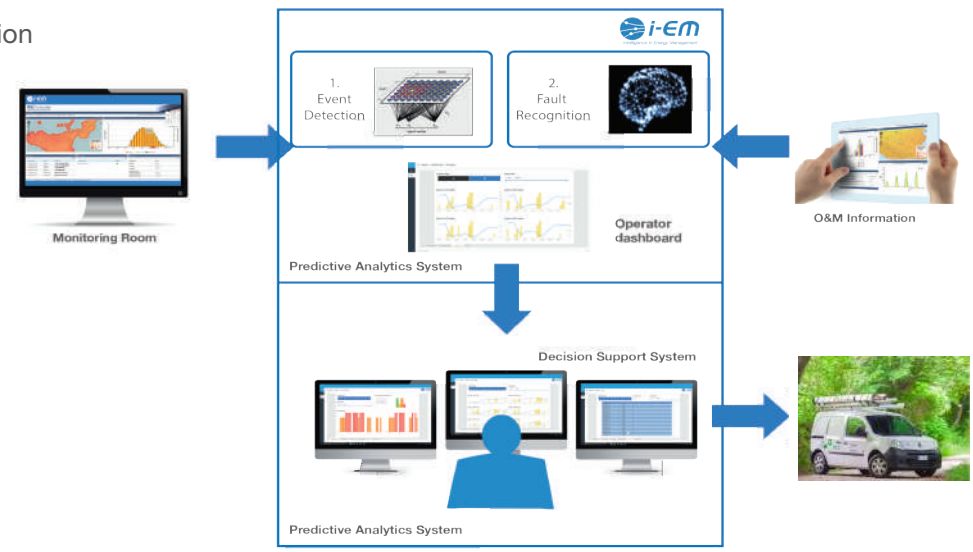
>> Automatic alarms logbook

>> Manual alarms logbook

Plant Information

>> Plant configuration

>> Inverter tech



Customized solution according to Plant Configuration and Inverter Technology

The service is highly customized on customer's PV plant characteristic.

>> Inverter technology and Plant Configuration represents relevant input of the model ensuring customized solution to customer plant.

>> Historical manual and automatic alarms logbook-based models training ensures to follow customers' plant specific behavior.

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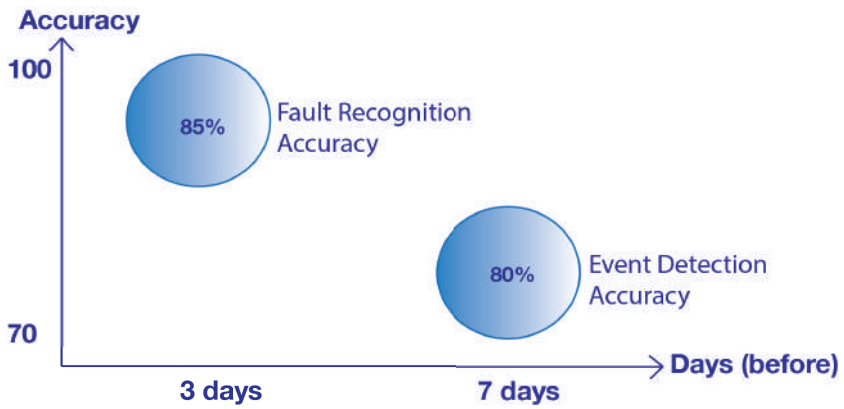
Performance

The PREDICO Service reliability has been widely assessed through the whole software development cycle as well as during the real-time services to customers.
The performances are continuously assessed by means of the usual classification metrics such as Sensitivity, Specificity, Accuracy and ROC curve.



The software already shown outstanding capabilities to predict faults for several PV plants located in Europe and, currently corresponding, to hundreds of inverters manufactured by five well-known technology brands.
The application of PREDICO reduces lost production typically achieving 10-15% of energy yield improvement.

PREDICO Target Customers

PREDICO has been already adopted by customers among the following classes:

>> O&M companies
>> Big PV plants owners
>> Inverter manufacturers