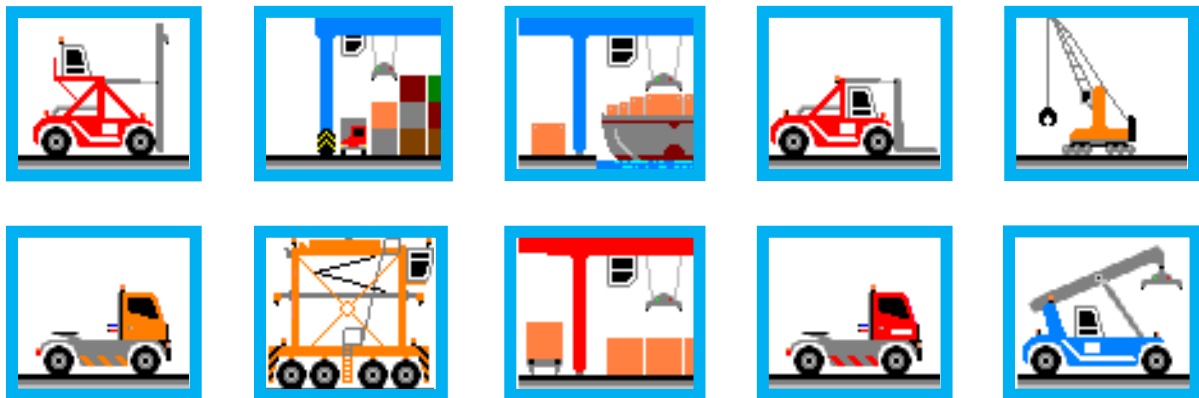




E-SMART

SYSTEM INFORMATION SHEET



ASSET MANAGEMENT AND EQUIPMENT STATUS VISUALISATION FOR PORT EQUIPMENT





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What is E-SMART

E-SMART is a management tool providing an instant status visualisation of the plant and equipment operated in your business. It alerts your operatives to quickly identify breakdowns and unplanned maintenance requirements allowing you to take immediate remedial action. It provides the operational status of the equipment across departments to key personnel in a clear format.

New features in E-SMART also includes planned maintenance, minor fault monitoring, and general status information. E-SMART also provides KPI data to allow the equipment operational availability and reliability to be assessed with various statistics.

Why change

Many organisations manage their equipment assets on spread sheets, or manual means such as white boards, paper or alike, and many utilise legacy systems. In most cases the methods used lack visibility across the organisation, with many systems or methods operating in isolation or without flexibility to easily share key data across the operation. E-SMART can also interface to your legacy system to provide full visibility whilst maintaining your other systems if required.

Real operational benefit

E-SMART can be implemented at low cost and zero risk and is an excellent ROI (return on investment) for organisations looking to improve their equipment availability through transparency.

It has been developed with the direct input of container terminal operations and engineering staff, and has been installed in several ports to manage their operation critical assets such as Straddle Carriers, Top Picks, Side Loaders, Reach Stackers, RMG cranes, RTG cranes, Ship to Shore cranes etc.





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Information sharing

E-SMART provides remote access for management and key terminal personnel. From their desktops they can view the terminal status in real-time with live information and also access details on equipment history.

It is used by the Operations team to see the equipment availability and any faults. The real time reporting also allows them to see when equipment is ready for operation again following an outage. They can also see any minor non critical faults.

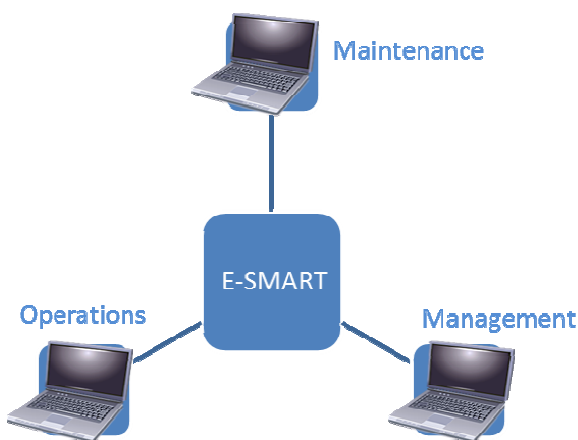
"The system eliminates mis-communication between the Maintenance and Operations departments, Now E-SMART makes sure we know what equipment is available."



Practical, useful tools

E-SMART is used by the maintenance team to alert them of equipment faults; it allows them to automatically keep the management team informed of the status, and reports the equipment as operational again once repaired. The maintenance supervisor can instantly see the status of all the equipment in real-time using simple clear icons. The yard location can also be displayed allowing the rapid dispatch of a repair crew. Simply by clicking on the icon the supervisor can see the detailed history and status of the equipment. He can change the status of the equipment or mark the equipment for planned maintenance. The Maintenance team can also monitor fuel, scheduled maintenance as well as monitor and report on major and minor fault repairs.

"Using the E-SMART remote the drivers can report breakdowns directly to maintenance, and I can update the status as the work progresses"





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E-SMART configuration

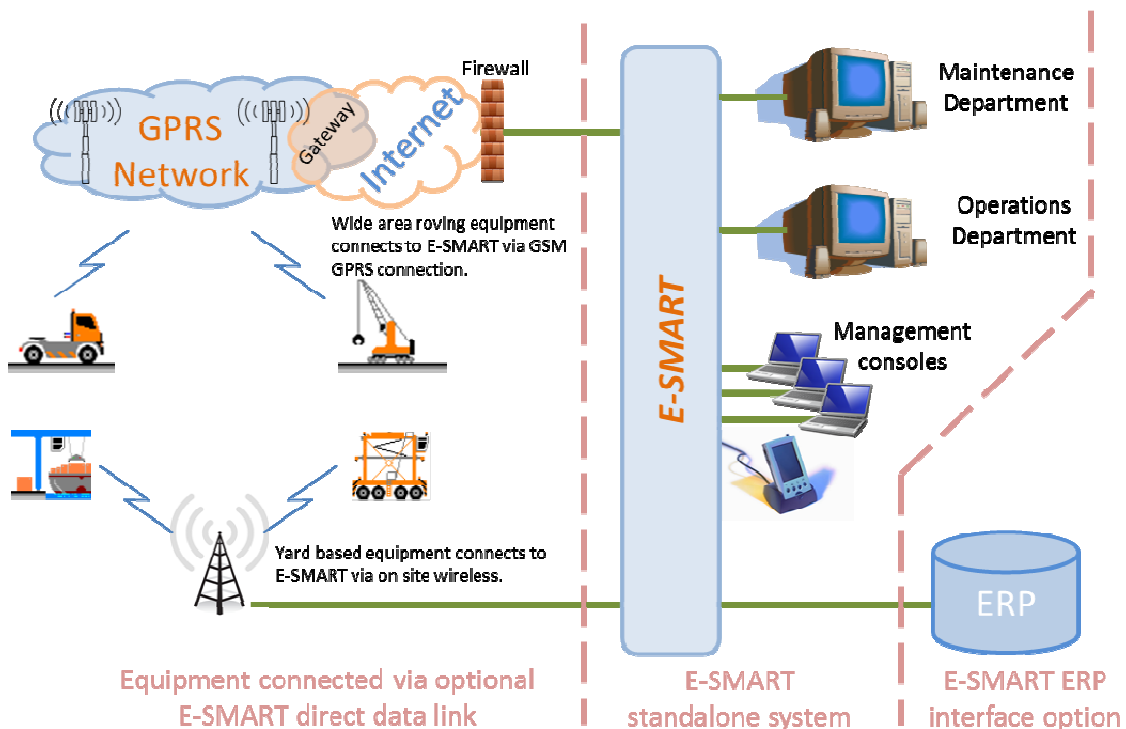
Smart data capture

E-SMART can be implemented as a standalone system or provided with a direct data link to the equipment. The direct data link is where status data comes directly from the mobile equipment via a GPRS, WiFi or Narrow Band wireless data network. Sites that opt for the E-SMART direct data link can report faults directly from the equipment automatically, capture operating hours and other features to provide a level of automation to the maintenance call outs, re-fuelling and other features.

In standalone mode the maintenance requirements are entered by the maintenance supervisor simply with a few clicks of the mouse.

E-SMART integration

E-SMART can also be connected to an ERP system to allow automated EDI transfers of equipment status to the ERP system allowing automatic generation of work orders and many other benefits including the utilisation of the E-SMART data sharing and a rapid overview of the equipment status across departments.





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Modular monitoring

Main equipment status screen

At a glance key personnel can identify when equipment breaks down and its current status.

The screenshot shows the 'E-SMART Major Faults' application window. The main area displays a grid of equipment icons, each representing a different piece of machinery. Each icon includes a status indicator: a green checkmark for 'ready to operate', a red wrench for 'under repair', a magnifying glass for 'minor faults', and a fuel pump for 'fuel and planned maintenance status'. The equipment types and IDs shown include SC 62-69, SC 70-77, SC 78-79, MF 04, MF 06, TUG 01, TUG 05, TUG 07, TUG 11, TUG 24, TUG 31, RSK 221, RSK 223, RSK 234, TPL 132, TPL 193, TPL 201, TPL 235, FRK 911, QC 01, QC 02, QC 03, QC 04, QC 05, QC 06, QC 07, RMG 01, RMG 02, and RTG 01.

An inset window titled 'SC 62 Minor Faults' is open, displaying a table of active faults:

Fault Type	Operator Id	Fault Opened	Fault Closed
Windscreen wiper blade	Joint	21/11/2011 10:01	22/11/2011 14:00
Cabin heater	Lambert	16/11/2011 08:32	
Seal height adjuster	Brunell	15/11/2011 17:50	15/11/2011 19:30
Cabin heater	Carter	15/11/2011 10:40	15/11/2011 19:30
Low tyre pressure	Branson	13/11/2011 21:30	14/11/2011 07:20
Door not closing properly	Jameson	10/11/2011 09:25	14/11/2011 07:20
Cabin lightbulb broken	Joint	07/11/2011 16:20	07/11/2011 21:00

The window also includes a 'Fault Description' field and buttons for 'New', 'Edit', 'OK', and 'Cancel'.

Main screen showing an overview of : Equipment breakdowns : Equipment under repair : Equipment ready to operate : Equipment with minor faults : Fuel and planned maintenance status.

Minor faults summary window showing active faults

Minor faults reporting and visualisation

In addition to E-Smart showing the major fault status of the equipment minor faults are also indicated on the main visualisation screen. Minor fault reporting assists the operations department to identify equipment that can be operated (within the limitations of the minor faults) during times of high equipment demand, and also allow the maintenance department to record, report, and clear minor equipment faults.





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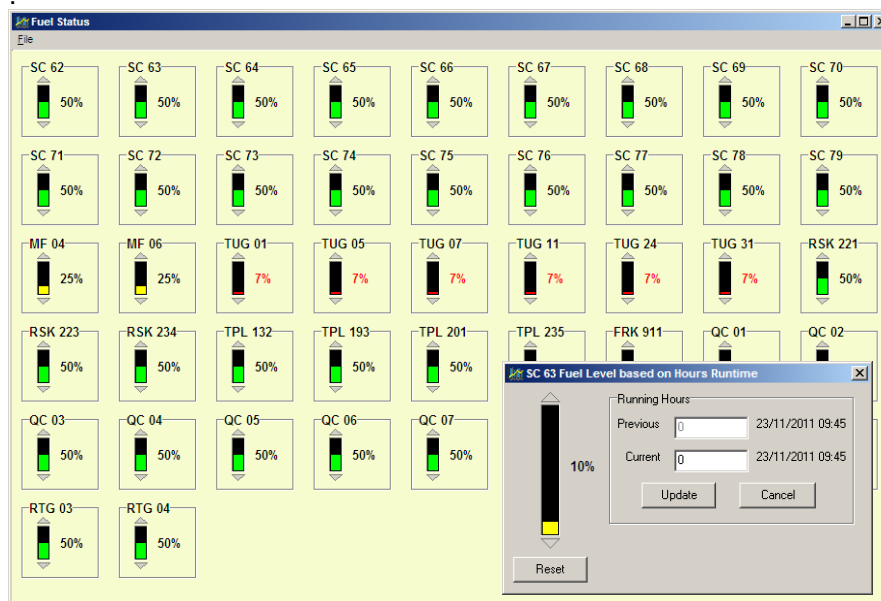
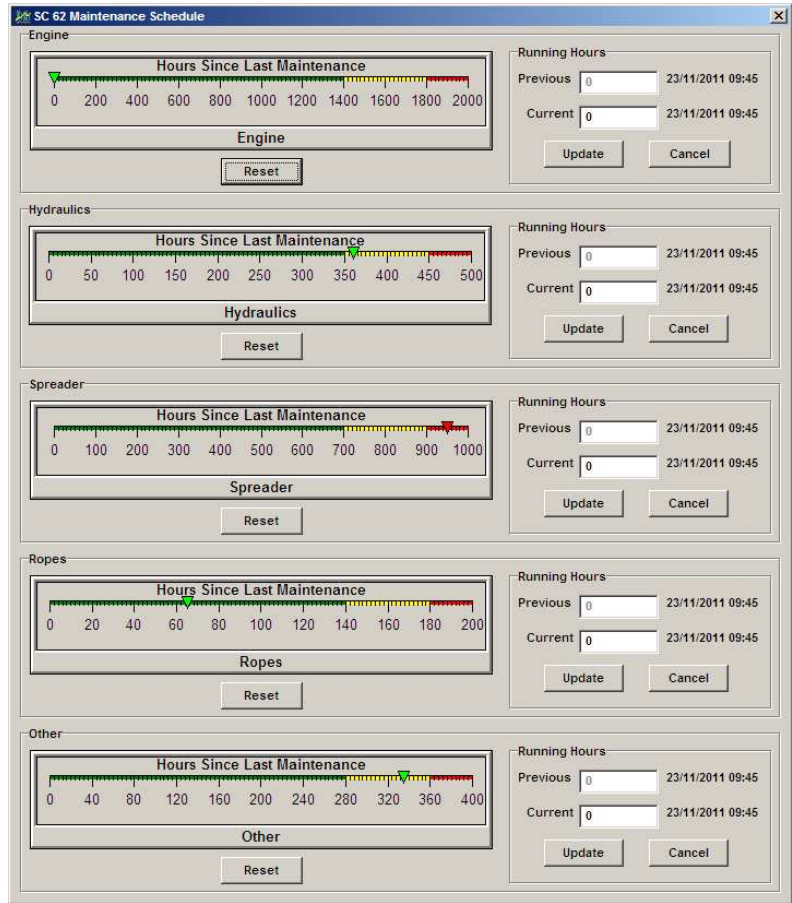
Planned maintenance

The Maintenance supervisor can see at a glance items due and shortly becoming due for scheduled maintenance.

Each individual item of equipment also has its own detailed screen and schedule of maintenance

Tyre warnings

Tyre condition is critical to the safe operation of the equipment. E-SMART has a feature for the last inspection of the tyre to be noted and when the next inspection is due. Based on tyre age a warning will also be given when the tyres should be replaced.



Fuel consumption

E-SMART provides estimated fuel levels and warnings to help the operation achieve a more efficient fuelling routine by not filling lightly used equipment unnecessarily and ensuring priority is given to equipment that needs it most.





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General characteristics and calendar

For items of equipment that may be loaned or operated across different operations an assignment calendar is available showing the equipment's assignment and duration. E-SMART can also show general equipment characteristics such as type, lifting capacity, fuel capacity, equipment age, and other features.

Equipment shock sensing

E-SMART also receives direct data from the Equipment Shock Sensing System. These advanced accident management features allow incidents detected by the system to be immediately reported and shown on the E-SMART visualisation screen. Any incident is flagged and potentially damaged or unsafe equipment does not continue to operate undetected.

Engineers notes

Engineers notes allows the engineers to pass on information to the next person working on an item of equipment and can be viewed by supervisors to assess the condition of the equipment and is particularly useful when longer term issues exist and information may well be forgotten or overlooked.





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KPI data

Using the statistical analysis tool provided with E-SMART authorised users can analyse the operational outages and KPI's in various different ways. All departments have the same data in a format that is easily exported into Microsoft Office products to allow management to fashion custom reports as required.

Equipment	Fault Type	Start Date	End Date	Faults	Down Time
All RTG	Scheduled	12			09:38
RTG 03	Gantry	08			00:49
RTG 50	Gantry	08/06/06	13/06/06	05	01:03
RTG 21	Trolley	01/06/06	05/06/06	04	02:22
All QC	Hoist	20/05/06	13/06/06	23	05:17

KEY E-SMART FEATURES

- Maintenance immediately informed of breakdown.
- Supervisors / Managers have an instant overview.
- Operations know equipment available.
- Equipment scheduled maintenance planning.
- Fuel monitoring.
- System logs and reports for performance analysis.
- Operators quickly report faults using RDT.
- ERP system automatically advised of fault.
- Can be integrated with security access system.

Future developments

ITS are continually developing their systems and services. Updates and new functionality are planned for future E-SMART releases including the addition of built in dashboards showing KPI data in a graphical format for equipment operation and availability. E-SMART is highly customisable and as well as our development programme ITS provide custom solutions and modules to meet specific customer requirements.

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