

PRISMIC® PMS UPGRADE SOLUTIONS ENHANCED SYSTEMS FOR ENHANCED PERFORMANCE

BRUSH Power Management System Upgrade – keeping up to date as technology advances.

At BRUSH we've been continuously updating and upgrading our PRISMIC® product range to take advantage of the latest technologies for over 30 years.

Both hardware and software improve regularly and we relentlessly focus on identifying components that can be upgraded to provide enhanced capability, as well as looking for those that may become outdated or obsolete.

Our key priority is to keep your Power Management System running problem free 365 days a year with excellent support and maintenance.

To maximise your system's operational life, we always aim to repair or replace any part of your system if required. However, as production of older components cease, some repairs and replacements can become increasingly difficult or impossible to implement.

In instances such as these, or when the maintenance and risk involved with running an older system outweighs the cost of replacement, we recommend upgrading to the latest generation PRISMIC® PMS product.

A new bespoke system can bring a multitude of benefits and BRUSH can help make the transition trouble free.

BRUSH has extensive experience in upgrading power management systems. This has been achieved by including upgrade issues in the design process of new products.

To minimise the disruption and duration of the changeout, we've retained the 19" rack format for our processors and I/O cards, which means that an upgrade requires minimum panel re-wiring. In the majority of cases we can replace the existing rack without having to make metalwork modifications.

In addition we've also developed interface converter boards to convert from the new high density I/O boards to the original terminals, vastly reducing the need to make wiring changes.

BRUSH site engineers are available to visit your installation to help determine the most cost effective way forward.

Benefits of upgrading can include:

- Increased capability through improved features and additional functionality provided by newer processors and components
- Old and obsolete components are replaced reducing the risk of irreparable faults and time consuming failures
- Improved support into the future is possible with the latest software compilers and techniques, enabling support engineers to provide faster response to site issues.

And an upgrade of your existing PRISMIC® Power Management System is possible with minimal interruption to your operations.

It is likely that upgrading your PRISMIC® PMS could be more cost-effective than making modifications and continuing to operate and maintain an old system.

HIGH TECH, HIGH PERFORMANCE, LOW RISK, LOW COST.

Our evolution could be a revelation

The latest technology, configured for your specific power system, can improve performance and reliability. The system also provides a far lower risk of failure and therefore lower maintenance costs.

The latest networked PRISMIC® PMS uses multiple 32bit Intel ARM based processors to run its core control algorithms. This 500MHz RISC based machine is specifically designed for industrial Ethernet applications and combines significant processing power, high network throughput and minimal power consumption. This low power unit eliminates the need for a heatsink and fan, which significantly increases reliability.

An Infineon TriCore processor is used for gathering I/O in the field. This 32bit network processor enables us to gather data from proprietary plant monitoring units and distribute it over a deterministic Ethernet network. The unit replaces multiple legacy processor cards and incorporates all watchdog and communications functionality that was previously supplied on a separate card. This reduction in component count leads to a significant increase in reliability and availability.

The PRISMIC® PMS application takes full advantage of the Ethernet multicast facility to enable all I/O data to be accessed at any location. As a result, it can easily be configured to have multiple masters, with each master situated at a different geographical location.

This provides the tremendous advantage that localised control of any power system segment can be offered to mitigate against any network communication problems. As the communications network is divided, a dormant master can take control over the newly isolated section. In situations where fibres can be damaged (e.g. trawlers, hostile territories or trench digging) PRISMIC® PMS can reconfigure to make best use of the available network.

What's more, if any master should fail, one of the many standby masters can simply take over.

The use of Ethernet communications allows upgraded power management systems to be easily expanded to encompass additional power system equipment. Multiple power management systems can be connected by using Ethernet over copper, fibre or microwave links.

Ethernet is used with great effect to communicate with the HMIs. Serial links from the PMS to the HMIs have now been replaced with Ethernet connections, allowing much faster update rates, including event logging and trending.

World renowned reliability and security

The application software we've painstakingly designed for PRISMIC® PMS uses the QNX Neutrino operating system.

QNX Neutrino is one of the world's foremost, top end operating systems and provides hard, real time response for high reliability, mission critical, industrial applications. It's a true microkernel operating system that gives us a safe and reliable basis on which to build our applications. No other operating system offers this level of security.

QNX Neutrino provides the following high availability features:

- Process watchdog for application monitoring and recovery
- Self healing inter-process communications
- Restartable device drivers and operating system services
- If virtually any component fails, even a low-level driver, it won't damage the kernel or other components
- Process model ensures that if a component fails, QNX Neutrino can cleanly terminate it and reclaim any resources it was using without the need to reboot

The new generation PRISMIC® PMS sets a new standard. When you upgrade, you can benefit from the latest features that are only available on the latest processors.

- Master processors have been replaced with low power Intel ARM based processors
- I/O processors replaced with low power TriCore processors
- Separate communications processors are no longer required
- Deterministic network now operates at 100Mbit/s (originally 10Mbit/s)
- Separate watchdog boards no longer required
- QNX real time operating system is used giving a deterministic response
- Time synchronisation is implemented between distributed systems
- High accuracy 'at source' event log time stamping
- 100ms analogue trending
- Networked HMI's resulting in rapid graphical update
- Unlimited, easily expandable connection of HMI displays available

TAKE ADVANTAGE
WITH LOCALISED CONTROL



UPGRADE PATH

	TYPE A	TYPE B	TYPE PS	TYPE PSe
Enclosure	19" rack mount	19" rack mount	19" rack mount	19" rack mount
Processor	Intel 8085	Intel 80188	Intel 386	Intel IXP425 and Infineon Tricore TC1130
Code	Assembler	C	C++	C++ & QNX
Communications	None	Serial	Serial & Ethernet (10BaseT)	Predominantly Ethernet (100BaseT)
Distributed systems	None	None	Remote I/O & multi master	Remote IO & multi master
Operating systems	None	None	None	QNX neutrino real time operating system
Event logging	None	Resolution time > 1000ms	Resolution time >250ms	Resolution time = 1ms (time stamped at I/O rack)
Trending	None	None	Resolution time >1000ms	Resolution time = 100ms
HMI	Character based	DOS	Windows NT serial comms	Windows XP/Vista/7>Ethernet comms/integrated event log
ENGINE AND GENERATOR CONTROL	Voltage control	Yes	Yes	Yes
	Frequency control	Yes	Yes	Yes
	Watts control	Yes	Yes	Yes
	VAr control	Yes	Yes	Yes
	Grid target (Watts & VArS & PF)	No	No	Yes
	Group target (Watts & VArS)	No	No	Yes
	Generator targets (Watts & VArS & PF)	No	No	Yes
LOAD SHEDDING	Gradual shedding	Yes	Yes	Yes
	Under frequency shedding	Yes	Yes	Yes
	Multiple level under frequency shedding	No	No	Yes
	Rate of change of frequency shedding	No	No	No
	Transformer overload protection	No	No	No
	Interconnector overload protection	No	No	No
	Load shed test facilities	No	No	No
	Grid import limit	No	No	Yes
	Generator breaker (on opening)	Yes	Yes	Yes
	Generator protection (on operation)	No	Yes	Yes
FAST ACTING LOAD SHEDDING	Pre-trip warning (on alarm)	No	No	Yes
	Turbine temperature HiHi (on alarm)	No	No	Yes
	Interconnector/bus coupler fault	No	No	Yes
	Transformer fault	No	No	Yes
	Fast shed test	No	No	No
	Multiple priority shed tables	No	No	Yes
	Dynamic priority shed tables	No	No	Yes
	Low spinning reserve	Yes	Yes	Yes
	To replace set that has failed to start	Yes	Yes	Yes
	To replace set that has failed to synchronise	No	No	Yes
GENERATOR STARTING	To replace set with pre-trip warning	No	No	Yes
	Manual via HMI	No	Yes	Yes
	Manual via push button	No	No	Yes
	Large load start requirement	No	No	No
	Manual confirmation	No	No	No
	Via DCS/SCADA	No	No	Yes
	High spinning reserve	Yes	Yes	Yes
	Generator/turbine warning	No	No	Yes
	Manual via HMI	No	Yes	Yes
	Manual via push button	No	No	Yes
GENERATOR STOPPING	Manual confirmation	No	No	Yes
	Via DCS/SCADA	No	No	Yes
	Real time deterministic Ethernet	No	No	Yes
	Serial DCS/SCADA link	No	Yes	Yes
	Ethernet DCS/SCADA	No	No	No
	Serial IED interface	No	No	Yes
	Ethernet IED interface	No	No	No
	OPC gateway	No	No	Yes
	IEC 61850 gateway	No	No	No
	Time synchronisation	No	No	Yes (100ms)
COMMUNICATIONS	Multiple autonomous masters if comms fails	No	No	Yes
	High speed HMI data refresh rate and trending	No	No	No (>1000ms)
	High resolution event logging	No	No	No (250ms)
	Ethernet PMS to HMI link	No	No	Yes
	Serial PMS to HMI link	No	Yes	Yes
	Touch screen HMI	No	No	No
	Multiple alarm priorities	No	No	No
	Multi-language support	No	No	No
	Group/multi set synchronising	No	No	Yes
	Tap changer control	No	No	Yes
HMI	Enhanced dry low NOX control	No	No	No
	Load start inhibit	Yes	Yes	Yes
	Voltage boost for large motor start	No	No	No
	Load reconnect	No	Yes	Yes
	Manual circuit breaker control	No	Yes	Yes
	Black start	Yes	Yes	Yes
	System training simulator	No	No	Yes
	Temperature compensation	No	No	Yes
	Dead bus check and closure	No	No	Yes
	CB discrepancy monitoring and associated safe mode	No	No	Yes
MISCELLANEOUS	Dual fuel compensation	No	No	Yes
	Engine load cycling	No	No	No



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