

# BEN 5000 to 6000 Upgrade

Extreme digital fault recorder



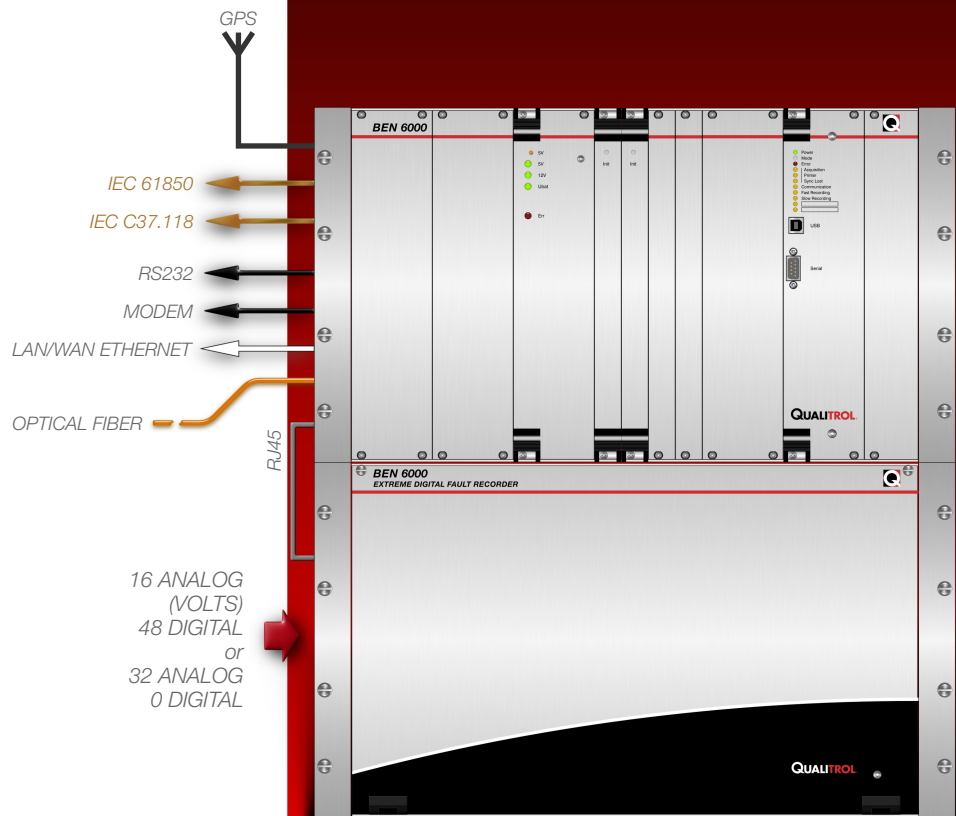
## Unique migration path to a state of the art platform

- Extend asset life
- Add PMU, Class A PQ and IEC 61850 functionality
- No changes to user input wiring
- Improve measurement accuracy and system reliability
- Turnkey solution from QUALITROL® certified field service engineers

### Product Summary

**Description** A means to upgrade a BEN 5000 to a new BEN 6000 without the need to touch field wiring

**Application** Utilities operating BEN 5000s who need to extend product life and add new features with minimum effort and risk



**QUALITROL®**  
Defining Reliability

# BEN 5000 to 6000 upgrade - Extreme digital fault recorder

## Unique migration path to a state of the art platform

- By simply changing to a new BEN 6000 control unit and replacing plug in cards in the acquisition racks it is possible to upgrade to full BEN 6000 functionality

## Extend asset life

- A practical way to rejuvenate an ageing asset and obtain a new 5 year warranty with full service and spares support
- Benefit from future enhancements of Master Station software

## Add PMU, Class A PQ and IEC 61850 functionality

- IEC 61850 features to include Goose triggering, virtual digital inputs and real time analog values
- Option to add a PMU card to comply with IEEE standard C37.118-2005 - monitor 3 circuits (3 current and 3 voltage)
- Option to add Class A PQ card to comply with standard IEC 61000-4-30

## No changes to panel wiring

- The upgrade process is designed to keep the original BEN 5000 acquisition racks with their shunt plates and external terminals
- It is not necessary to change any of the existing user input wiring

## Improve measurement accuracy and system reliability

- 100% compliant with BEN 6000 specification
- Capable of meeting all measurement demands in the future
- Replace spinning hard drive with solid state compact flash

## Turnkey solution from QUALITROL certified field service engineers

- *Leave everything to us!* - no need for 3rd party contractors
- QUALITROL have already worked on many of the BEN 5000 sites and are familiar with local practices
- 'Peace of mind' service to maximise equipment uptime: QUALITROL engineers are BEN experts and are therefore capable of completing the upgrade in the minimum time

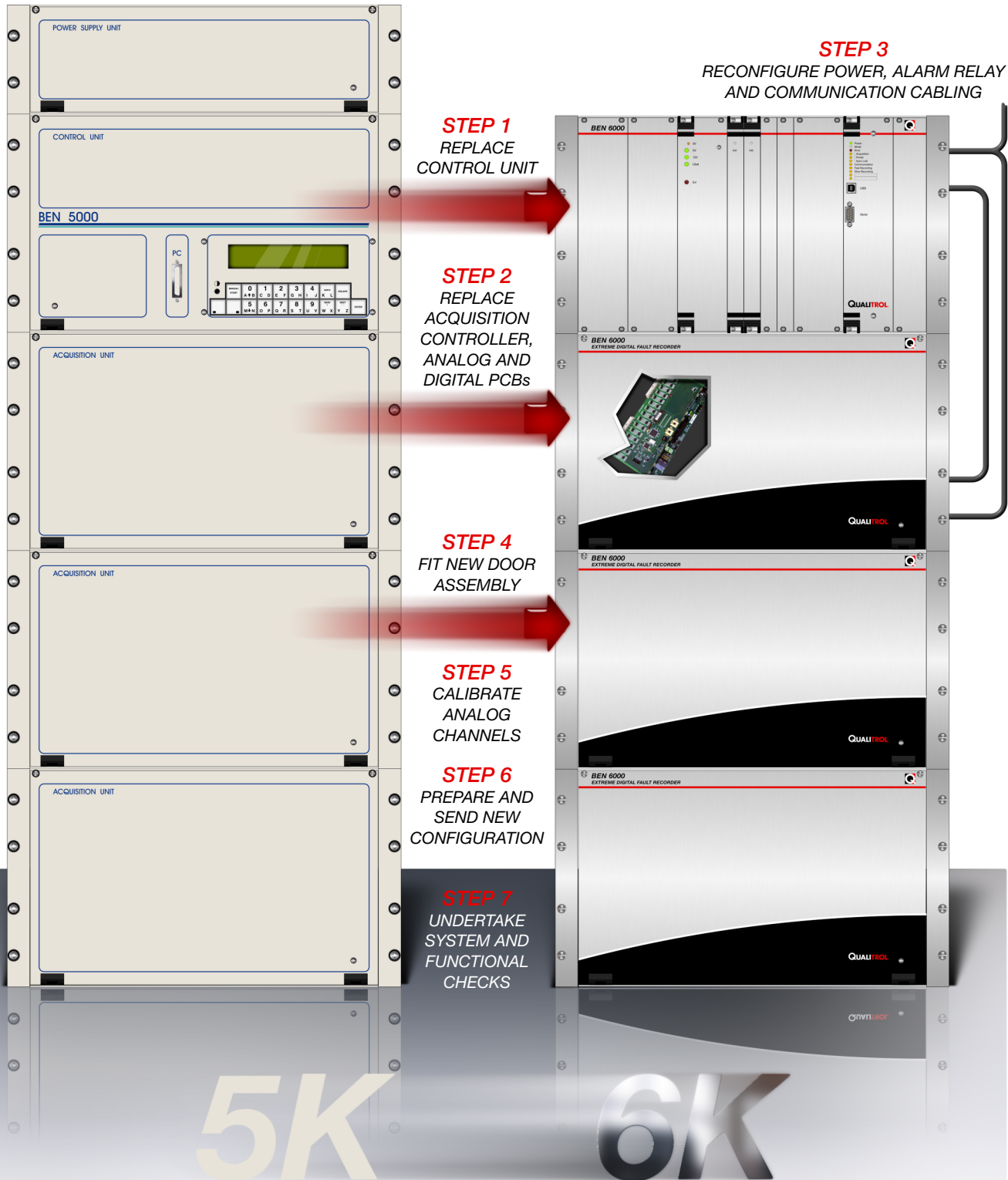
UPGRADE COMPONENTS	
Item	Part Number
BEN 6000 control unit	According to standard BEN 6000 BOM*
Acquisition controllers	SENS 639-01
Optional PMU card	SENS 823-03
Optional PQ card**	SENS 823-02
Analog card	SENS 442
Digital card	SENS 441
BEN 6000 optical card kit (for remote acquisition unit)	SENS 5060-01, SENS 5061-02, SENS 5062-02***

### Notes

- \* The number of vortex and sensor boards fitted to the BEN 6000 control rack depends on the current BEN 5000 configuration.
- \*\* The BEN 6000 control rack must be fitted with the CPU board SENS560-04 with the high accuracy crystal for the PMU function to be effective. The PMU card plugs into carrier board SENS631-13 (usually comes with the PMU option)
- \*\*\* The BEN6000 FO module (SENS5062-02) is secured in the BEN 5000 remote acquisition PSU rack and a short patch cable used to connect to the original rear panel.



## Upgrade process - 7 steps



### Notes

- A BEN 6000 optical interface card will have to be fitted to each remote acquisition rack assembly
- For large concentrated systems (greater than 4 acquisition racks) a BEN 6000 PSU will be fitted inside the existing BEN 5000 PSU rack



## Improved performance obtained by upgrading to BEN 6000

PERFORMANCE MATRIX		
Functionality	BEN 5000	BEN 6000
Sampling rate	10kHz	12kHz
Analog channels / virtual	192 total	192 / 200
Analog to digital conversion	12 bit	16 bit
Voltage accuracy	<0.3%	<0.1%
Current accuracy	<0.5%	<0.2%
Alarm outputs	8	16
LAN speed	10Mbits	100M bits
Remote acquisition unit distance	1.2m / 2km	1.9m / 3km
PQ (optional)	Logging	Class A, IEC 61000-4-30
PMU (optional)	NO	YES
IEC 61850	NO	YES
Solid state memory	NO	YES
USB	NO	YES
Windows based configuration	NO	YES
Number of records stored	10,000	100,000
Virtual channel flexibility	NO	YES
Skew between channels	<25µs	<5µs
Synchronization (IRIG J +PPS)	<1ms	<1µs

*upgrade your ageing asset to BEN 6000  
...the choice of generation*



### QUALITROL® Field Services

QUALITROL® provides on-site commissioning/start-up and comprehensive maintenance contracts to all customers worldwide. To further improve reliability, an extended warranty is available on selected products commissioned by QUALITROL®.

### QUALITROL® Educational Services

QUALITROL® professional training (designed to achieve hands-on performance based objectives) prepares operations, maintenance, and engineering personnel to install, test, configure, operate and maintain QUALITROL® products.

### QUALITROL® Accelerated Delivery

QUALITROL® provides accelerated delivery on many products and services including replacements, spare parts and repairs.

### About QUALITROL®

QUALITROL® manufactures substation and transformer monitoring and protection devices used by electric utilities and manufacturing companies. It is the global leader in sales and installations of transformer asset protection equipment, fault recorders and fault locators. Established in 1945, QUALITROL® produces thousands of different types of products on demand, each customized to customers' unique requirements.

©2008 QUALITROL® Company LLC, an ISO 9001 system certified company. All rights reserved. Information subject to change without notice. All trademarks are properties of their respective companies, as noted herein. IP-F22-02L-01E.