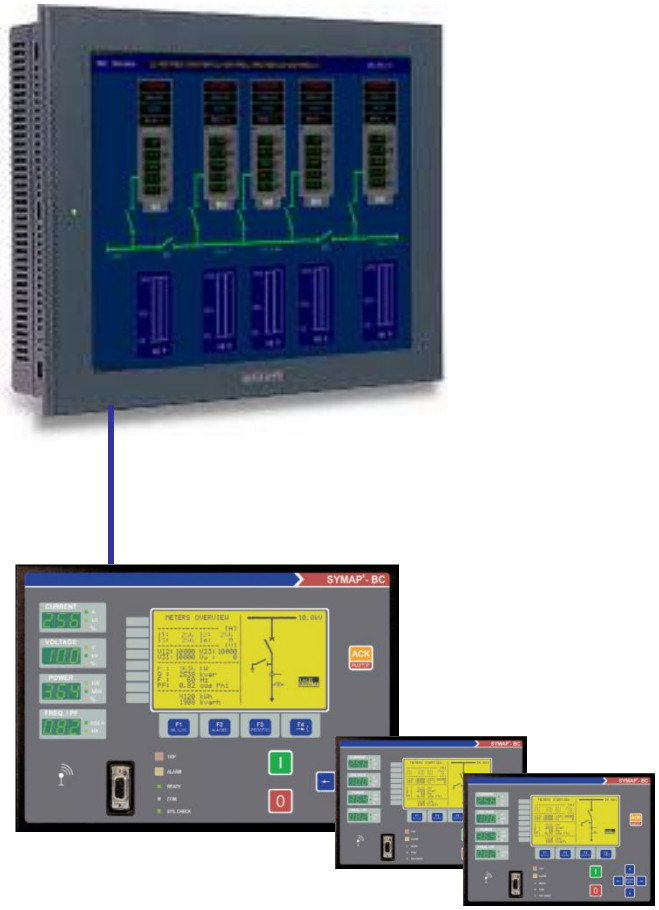
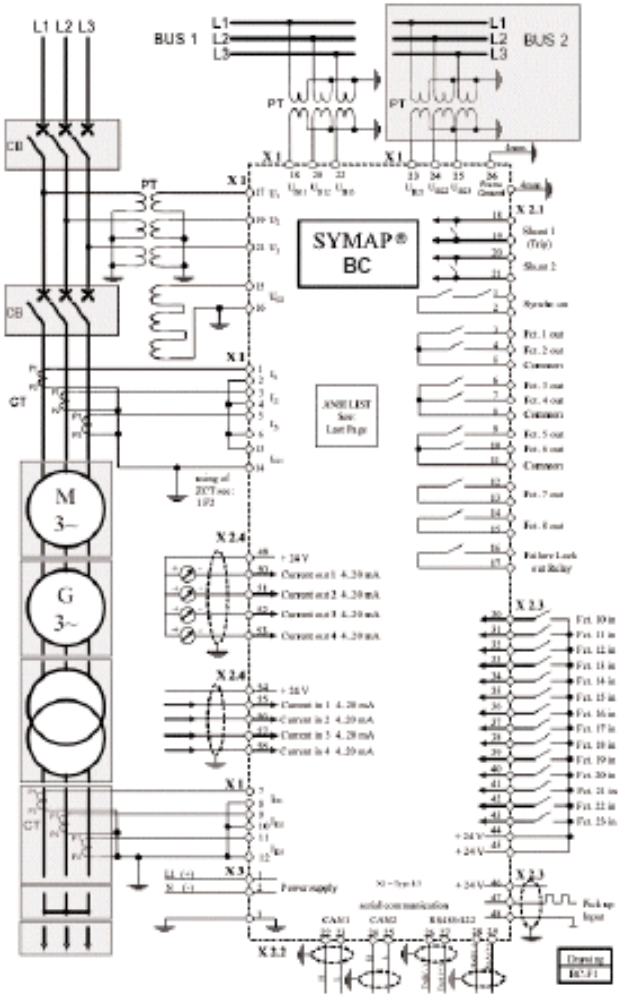
SYMAP® based Power Management System with HMI control panel

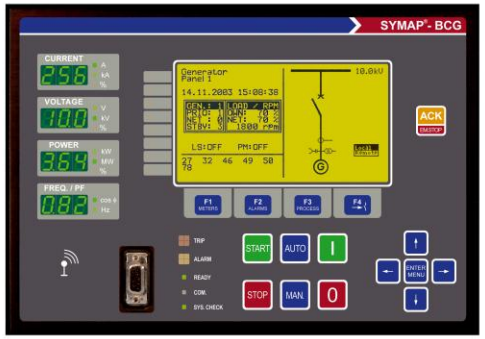




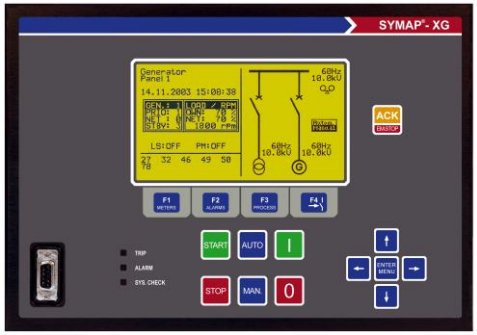
SYMAP SYSTEM OVERVIEW

- Digital Protection Relay for Medium and Low-Voltage Systems
- Diesel Control and Supervising
- Power Management
- Communication Interfaces
- PC Software for Programming
- Display Indication
- Integrated PLC
- Ansii protection function

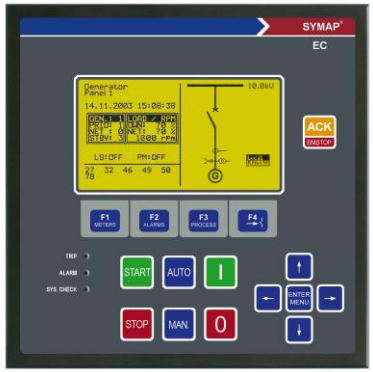
SYMAP® -BC and -BCG



SYMAP® -X and -XG



SYMAP® -EC



SYMAP INTERFACE

- **Human Machine Interface**

  - meter, alarm, process, breaker control

- **Analog Input for Measurement**

  - 3 x CT for feeder current
  - 3 x CT for differential current
  - 2 x CT for ground current
  - 3 x PT for feeder voltage
  - 3 x PT for bus bar 1 voltage
  - 3 x PT for bus bar 2 voltage
  - 2 x PT for ground voltage

- **Communication Interfaces**

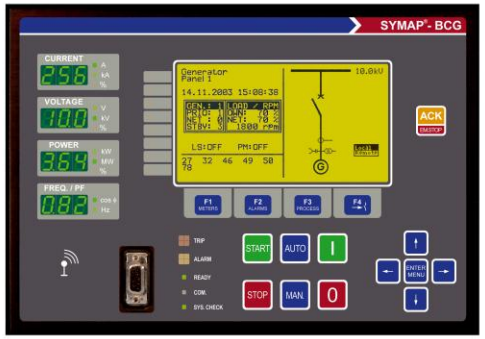
  - RS 232 on the front panel
  - 2 CAN-bus
  - RS 422/485 port
  - Profibus DP

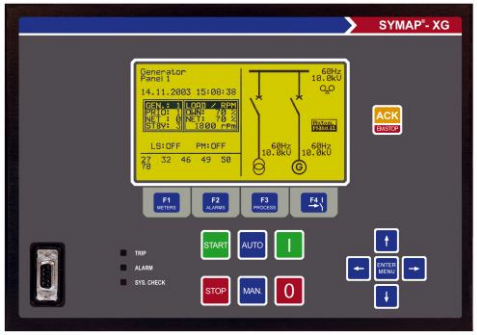
- **Communication**

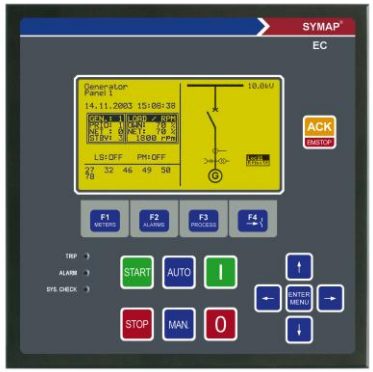
  - Remote supervision
  - Remote control
  - Remote parameter setting

- **Extended Board (Optional)**

  - 36 digital inputs
  - 24 relay outputs
  - 21 analog inputs PT100 or analog inputs 4...20 mA
  - 8 analog outputs 4...20 mA



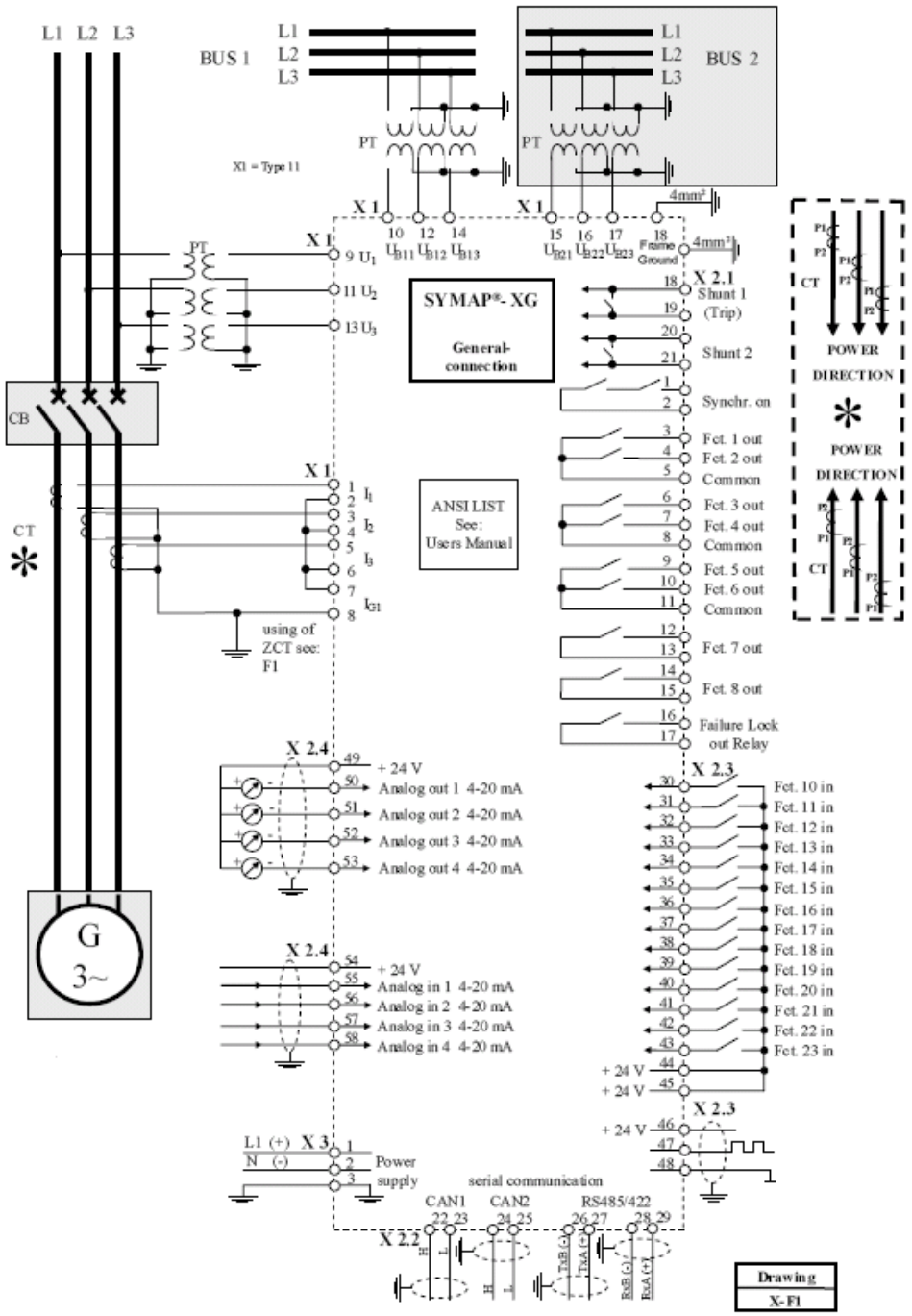




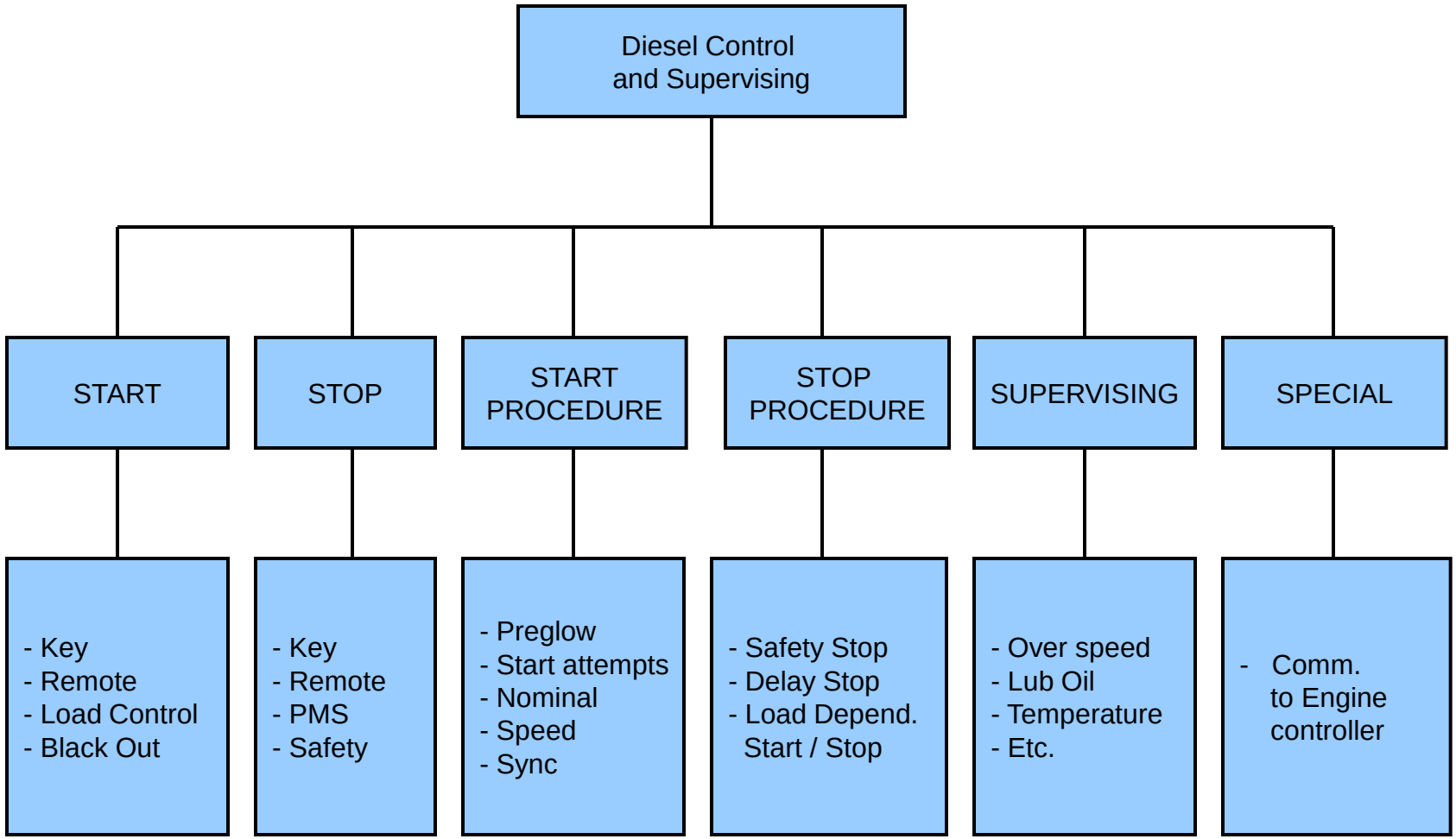
POWER CONNECTION

POWER MANAGEMENT SYSTEM – SYMAP

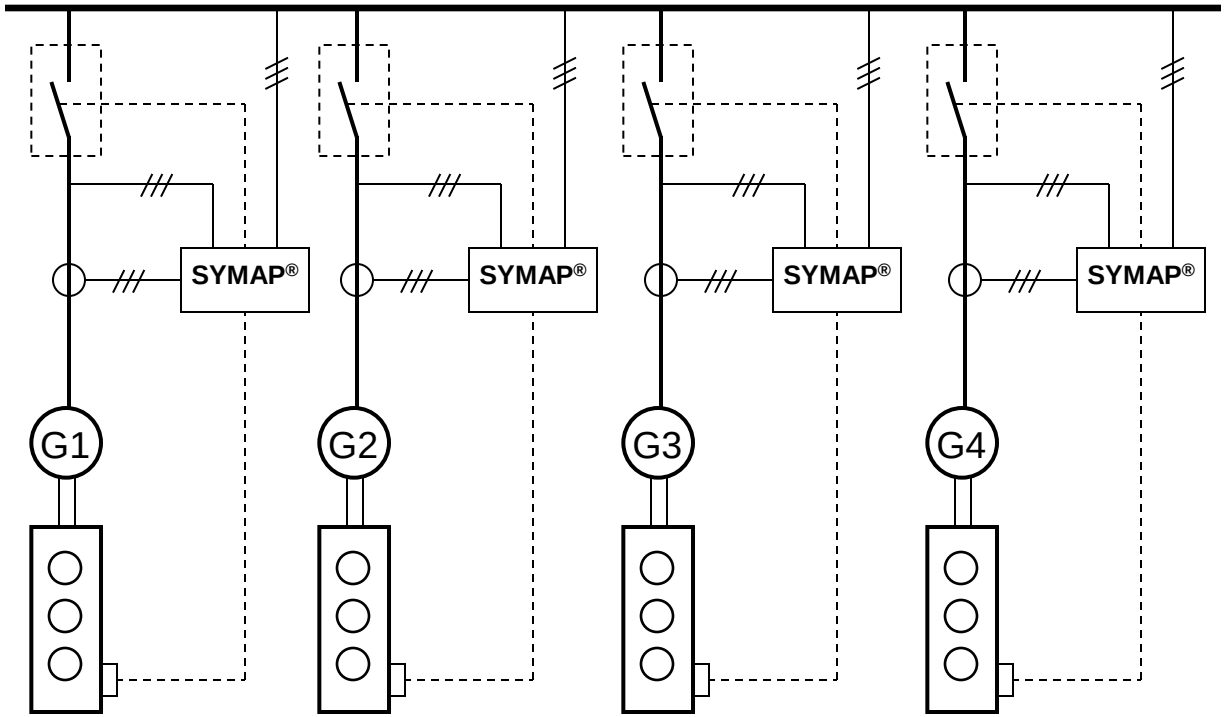
- Easy integration to switchboard
- Medium voltage connection via transformer
- Direct low voltage connection
- Direct sync function up to 3 buses
- Differential protection available
- Direct signals for diesel control



DIESEL CONTROL AND SUPERVISING



- Multimaster System
- 4 independent Nets
- Load dependent Start / Stop
- Load Sharing – Balanced / Unbalanced
- Frequency Control
- Voltage Regulator
- Power Factor Control
- Black Out Management
- Big consumer request
- Shaft Generator



ANSII PROTECTION

- Generator
- Motor
- Transformer
- Feeder
- Line

ANSI no.	Protection Function
15	Matching device (motorpoti)
24	Overexcitation protection
25 /A	Automatic synchronizing
27	Undervoltage, instantaneous, definite time
27B	Bus undervoltage, definite time
32	Overload relay
37	Undercurrent protection
40Q	Loss of excitation
46	Reverse phase
47	Phase sequence voltage
49	Thermal overload
50BF	Breaker failure
50	Overcurrent, instantaneous
50G/N	Current earth fault, instantaneous
51	AC time overcurrent, definite time, IDMT (6 curves)
51V	Voltage restrained overcurrent
51G/N	AC ground overcurrent, definite time, IDMT (6 curves)
51LR	Locked rotor
59	Overvoltage relay, instantaneous, definite time inverse
59B	Bus overvoltage relay, definite time
59N	Residual overvoltage
64	Ground overvoltage
66	Start inhibit
67	AC directional overcurrent, definite time, IDMT
67GS/GD	AC directional earth fault, definite time
78	Vector surge supervision
78S	Out-of-step tripping
79	Auto reclosing
81	Frequency supervision
81B	Bus frequency supervision
86	Electrical lock out
87M	Motor differential
87T	Transformer differential
87G	Generator differential
87LD	Line differential
87N	Restrict earth fault relay
94	Trip circuit supervision
95i	Inrush blocking
-- FF	Fuse failure (voltages)

SYSTEM CONFIGURATION – ALARM SYSTEM

HMI – touch screen

- Multiple data access, monitoring
- Redundant visualization

- Comprehensive overview of power plant
- Alarm ANSII functions
- Graphics interpretation
- Diesel START / STOP
- Load sharing settings
- Process value display
- Up to 8 SYMAP-BCG Diesel Generators
- 15” touch screen
- Diesel supervision available
- Diesel protection available

ALARM system

Optional

Traffic Controller

Traffic Controller

PROFIBUS or MODBUS

DG control 1

DG control 2

DG control 3

DG control 4

DG control x

SYSTEM CONFIGURATION – PLC

HMI – touch screen

- Additional diesel supervision
- Digital signal monitoring
- Analog signal monitoring
- Additional PLC functions

PLC unit

Optional

PROFIBUS or MODBUS

DG control 1

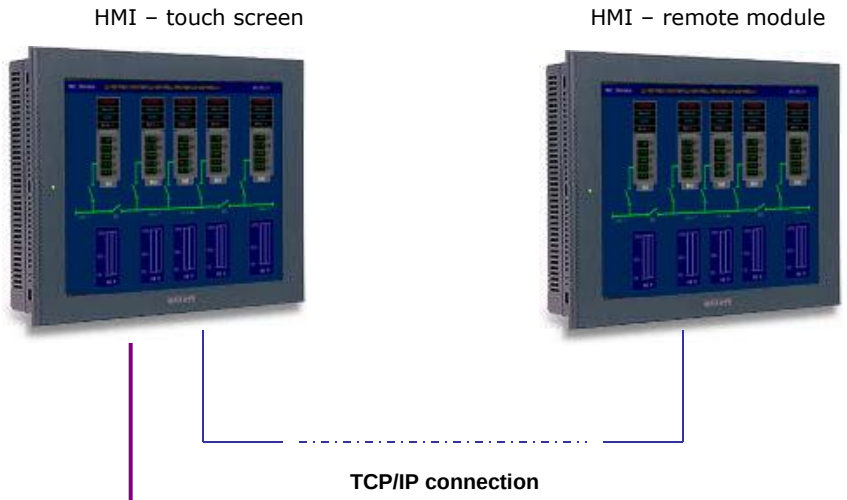
DG control 2

DG control 3

DG control 4

DG control x

SYSTEM CONFIGURATION – MULTI PANEL



- Up to 5 remote modules / panels
- Alarm ANSII functions
- 10“ – 15“ touch screen
- Ethernet connection

HMI CONTROL PANEL SPECIFICATION

- Panel AGP3000 - PROFACE
- Display Size: 3.8” to 15”
- Screen Type: TFT, STN color touch screens
- Analog Resistive Touch Screens (no grid)
- Ethernet: 10Base-T/100Base-TX
- USB: Two USB 1.1 Host Type A
- COM Port 1: RS-232/422/485
- COM Port 2: RS-422/485
- Compact Flash card slot Type II
- Remote Data Monitoring and reporting
- Expansion bus port for optional communication modules
- Global Certification: RoHS, UL Listed C1 Div 2, CSA, CE

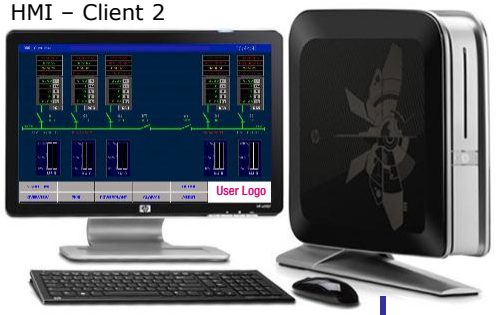
ISO 9001:2000 Quality System Certified

ISO 14000 Quality System Certified

PMS NETWORK INTEGRATION

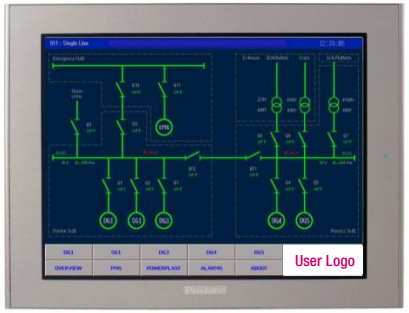
HMI – Client 1

HMI – Client 2



Ethernet TCP/IP

HMI – Master / Server

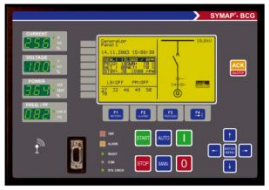


- Easy integration to ship's network
- Data access from ordinary PC computer
- No additional programming

Optional ALARM system

PROFIBUS or MODBUS

Node 1



Node 2

Node n

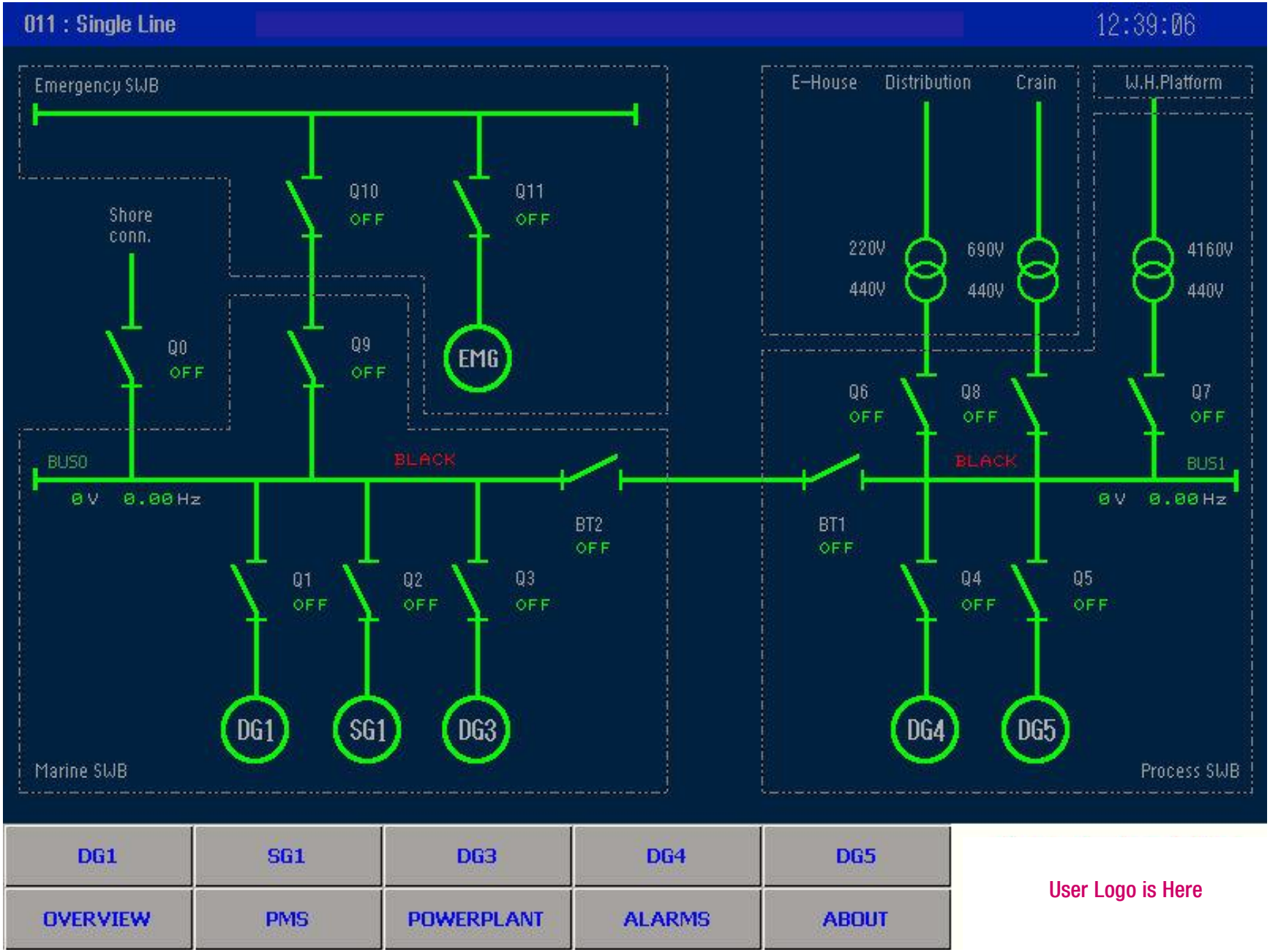
GRAPHICS EXAMPLE – DG1

User Logo is Here

GRAPHICS EXAMPLE – SG1

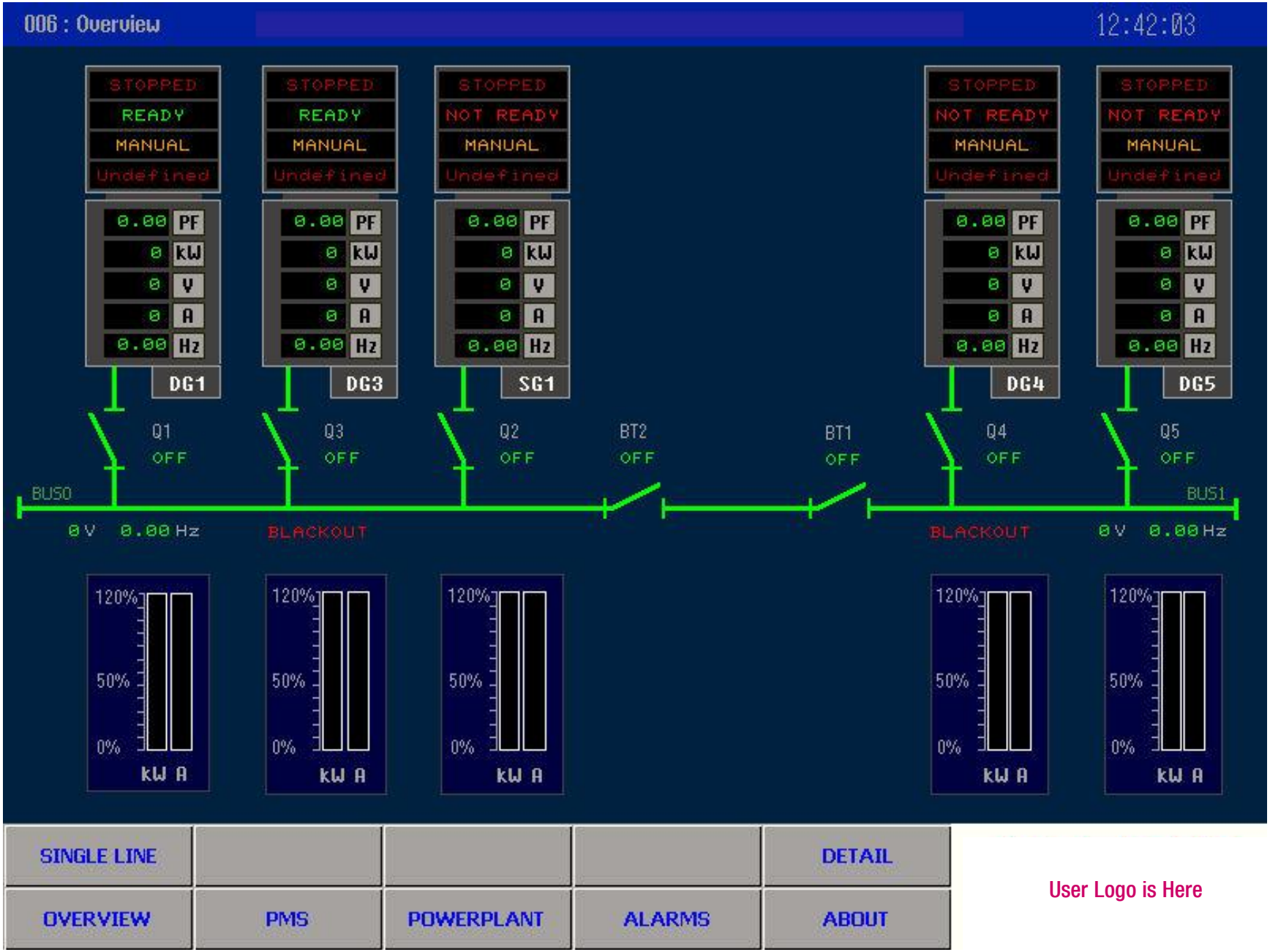
User Logo is Here

GRAPHICS EXAMPLE – SINGLE LINE



GRAPHICS EXAMPLE – MAIN

GRAPHICS EXAMPLE – GENERATORS



User Logo is Here

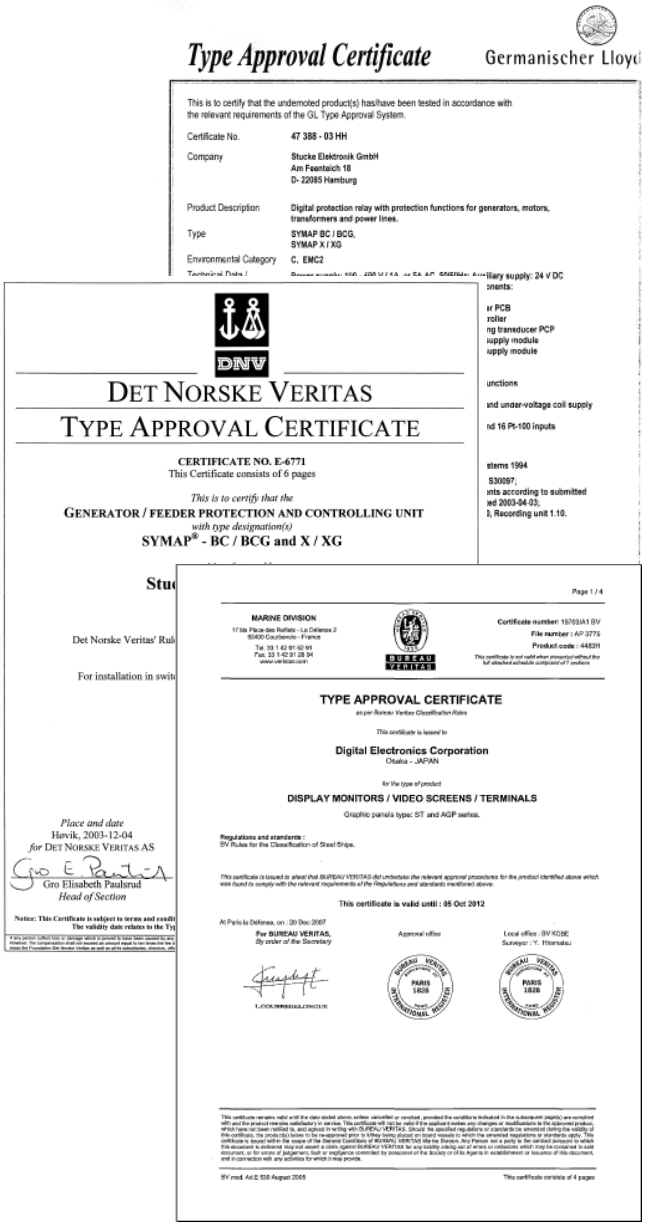
GRAPHICS EXAMPLE – PMS SETTING

GRAPHICS EXAMPLE – LANGUAGE OPTION

CERTIFICATES

The SYMAP® -BC family and the SYMAP® -X family have received a type approval from the following classification societies:

- Germanischer Lloyd (GL)
- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- Det Norske Veritas (DNV)
- Lloyds Register of Shipping (LR)
- Polish Register of Shipping (PRS)
- Russian Maritime Register of Shipping (RMRS)
- China Classification Society (CCS)
- Nippon Kaiji Kyokai (ClassNK)



Type Approval Certificate

Germanischer Lloyd

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No. 47 388 - 03 HH

Company Stucke Elektronik GmbH
Am Feentaich 18
D- 22085 Hamburg

Product Description Digital protection relay with protection functions for generators, motors, transformers and power lines.

Type SYMAP BC / BCG, SYMAP X / XG

Environmental Category C, EMC2

DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-6771
This Certificate consists of 6 pages

This is to certify that the
GENERATOR / FEEDER PROTECTION AND CONTROLLING UNIT
with type designation(s)
SYMAP® - BC / BCG and X / XG

Place and date
Harvik, 2003-12-04
for DET NORSKE VERITAS AS
Gro Elisabeth Paulsrud
Head of Section

MARINE DIVISION

TYPE APPROVAL CERTIFICATE

Digital Electronics Corporation
Osaka - JAPAN

DISPLAY MONITORS / VIDEO SCREENS / TERMINALS
Graphic panels type: ST and AGP series.

This certificate is valid until : 05 Oct 2012

Germanischer Lloyd (GL)

American Bureau of Shipping (ABS)

Bureau Veritas (BV)

Det Norske Veritas (DNV)