Digital control range for
grid parallel/bus tie

HEINZMANN®
thinking in drive and control

Si-TEC *Xtend* GSM

DATA SHEET

Model

Si-TEC *Xtend* GSM Master Control is available in 2 variations:

GSM Grid

Grid Synchronising and Import/ Export kW & kVAr Control

GSM BTB (GSM Sync)

For Bus Tie Synchronising (2-way) between Generator Buses

Description

Si-TEC (Smart Integrated Turbine & Engine Control) is the world's only digital governor fully integrated with an automatic synchroniser and kW / kVAr control, and was developed in 1991.

With more than 4000 systems now in operation globally, the Si-TEC Xtend control provides a further enhancement of this already successful product.

The Si-TEC *Xtend* GSM (Generator System Master) provides multiple functions including synchronising, paralleling, loading and unloading of a 3-phase power generation system with the "Supply Authority Mains or Grid". Up to 24 modules (combination of GSM and CGC) may communicate in a single network.

Key features

- Automatic synchronising (3-phase)
- Import/Export kW ref. control
- Import/Export kVAr ref. control
- Process control
- Grid voltage control
- Import/export kW, kVAr & kVA limiting
- Grouping control (for split bus systems)
- Summing load control (multiple GSMs)
- "Vector Disturbance" detection
- Import/export kWh & kVArh metering
- Flexible configuration
- User-friendly tuning software (PC tune)
- Extensive system diagnostics
- Optional I/O expansion

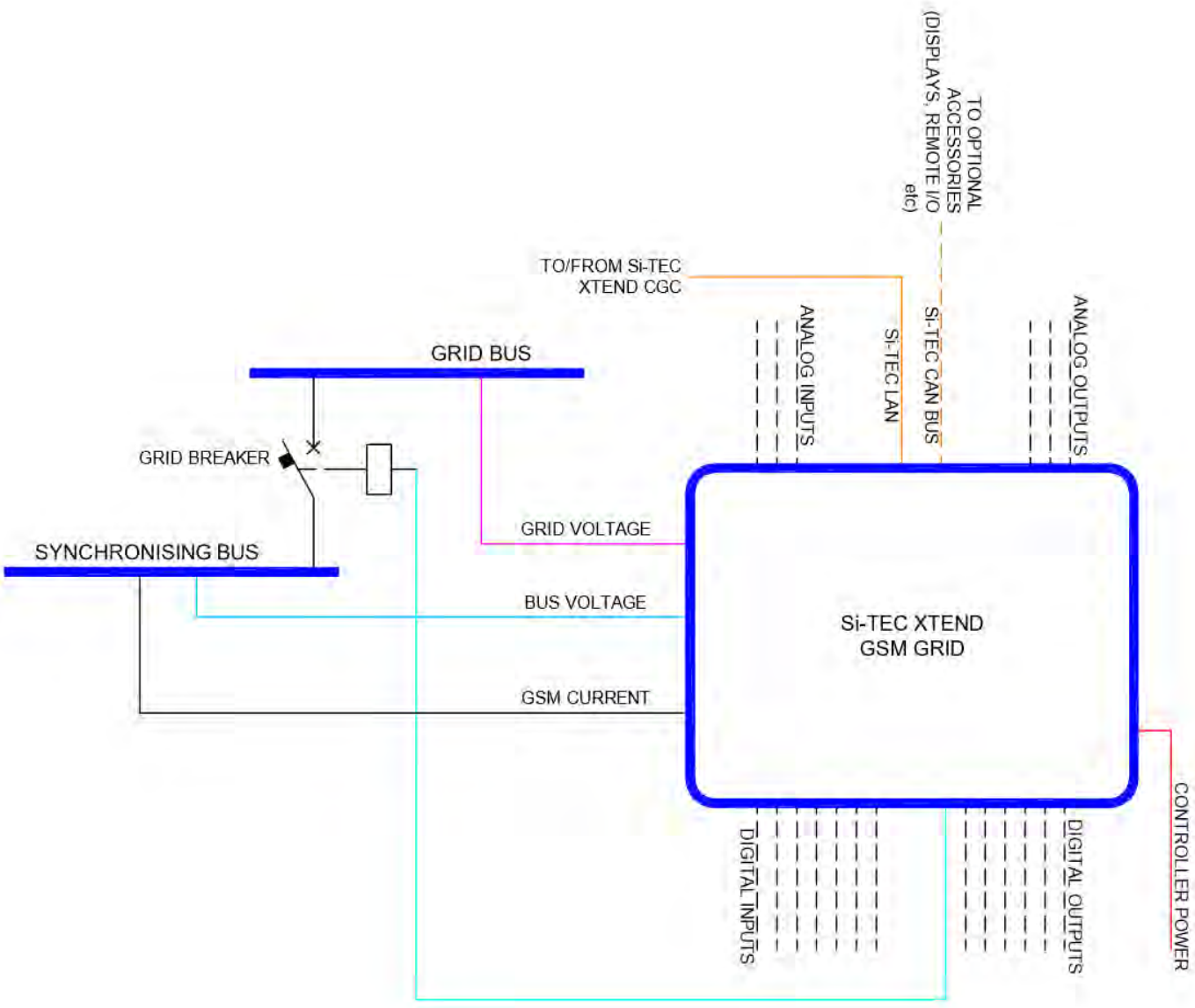
Features

- Automatic synchronising as well as kWatt & kVAr reference control via single logic input ("Go To Grid") function
- kWatt reference control via import/export kWatts, generated kWatts or generated % of rated kWatts, with multiple control mode selection
- kVAr reference control via import/export kVArs, generated kVArs, import/export PF, generated PF, etc., with multiple control mode selection
- Process control for co-generation or control of plant process (e.g. exhaust pressure, temperature, etc.)
- Grid voltage control for relatively "Soft" or "Weak" grids (e.g. high impedance power lines)
- Import/export kWatt, kVAr and kVA limiting, for grid incomer control within safe parameters
- Multiple GSM units in applications involving multiple grid/mains incomer feeders in single network
- Summing control of net load flow across all grid incomers in applications involving multiple masters
- Grouping control of Si-TEC *Xtend* units (GSM and CGC) for multiple electrical bus applications
- "True Time Error" correction at typically less than 30 seconds per year
- "Vector Disturbance" detection and alarm function (Vector 3-phase loss or Vector Phase Unbalance) within 50 mSecs, to maintain full operation of station
- Import kWatt-Hr, export kWatt-Hr, import kVAr-hr and export kVAr-Hr pulsed output and display
- Extensive I/Os that may be expanded (via CAN bus)
- Extensive diagnostic functions

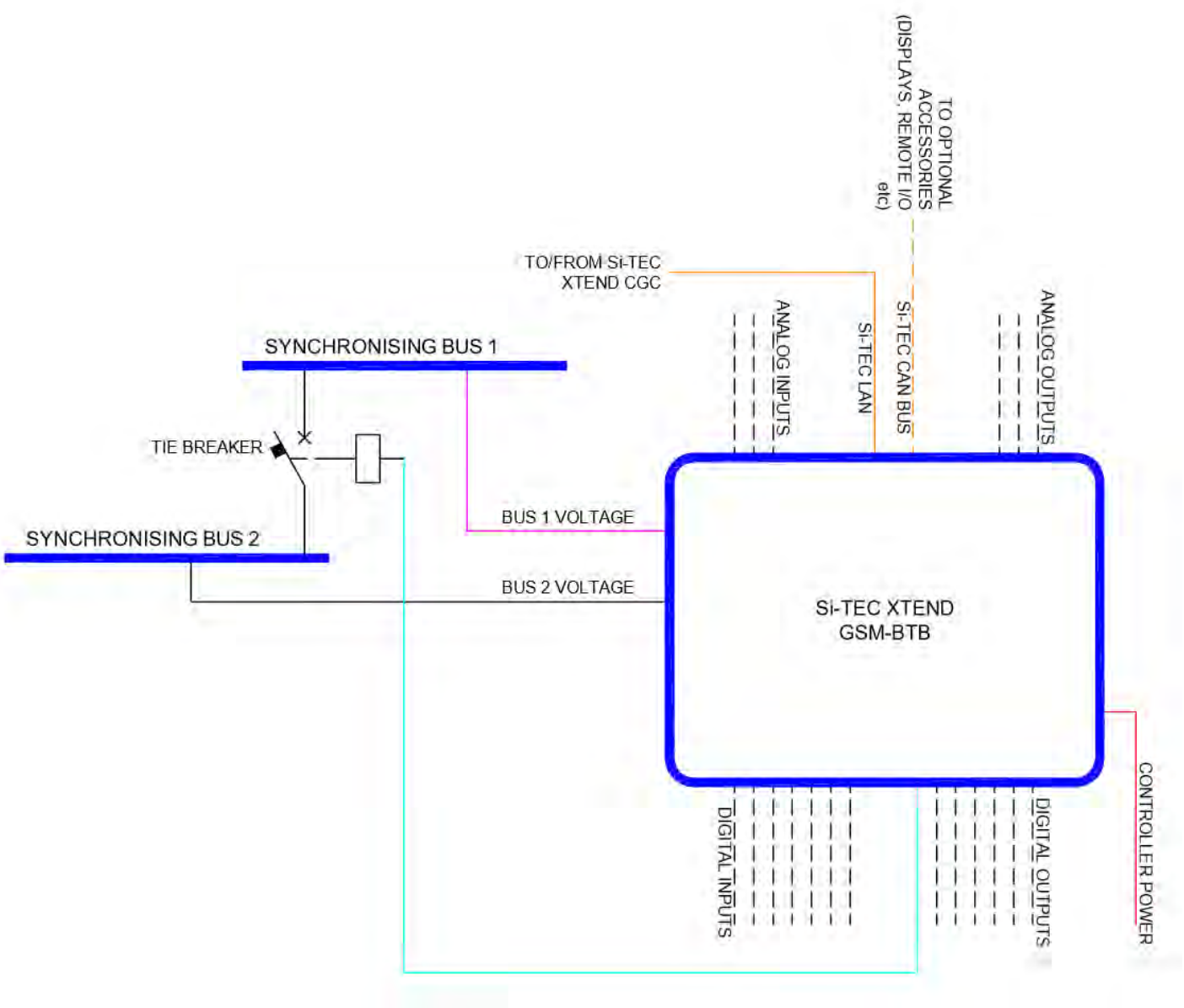
Application range

- Standby power stations where "Bumpless" (delayed soft) transfer back to the supply grid is required, with no exporting of power to the grid
- Standby power stations used for "Peak Shaving" (peak lopping) applications where generators parallel with the supply grid during "Peak Demand" periods, setting a maximum limit for the imported grid supply
- Prime power stations that parallel and are "Base Loaded" (constant supply) to the supply grid, with provision to "Export kWatt" to suit the suppy grid
- Prime power stations that supply power for plant load requirements, and export excess power to the supply grid (e.g. sugar mills, other industries, etc.)
- Prime power stations that supply power for plant load requirements, and require "Standby or Back Up" power from the supply grid
- Automatic synchronising across "Bus Tie" breakers (2-way synchronising) for split bus applications

Si TEC GSM Grid System Overview



Si TEC GSM BTB System Overview



Synchroniser

- Digitally integrated within GSM control
- Phase rotation check during synchronising
- Integrated independent "Synch. Check" relay (3-ph bus & grid check)
- Slip frequency, phase angle & voltage matching
- Typically better than 5 seconds synchronising time for most applications.

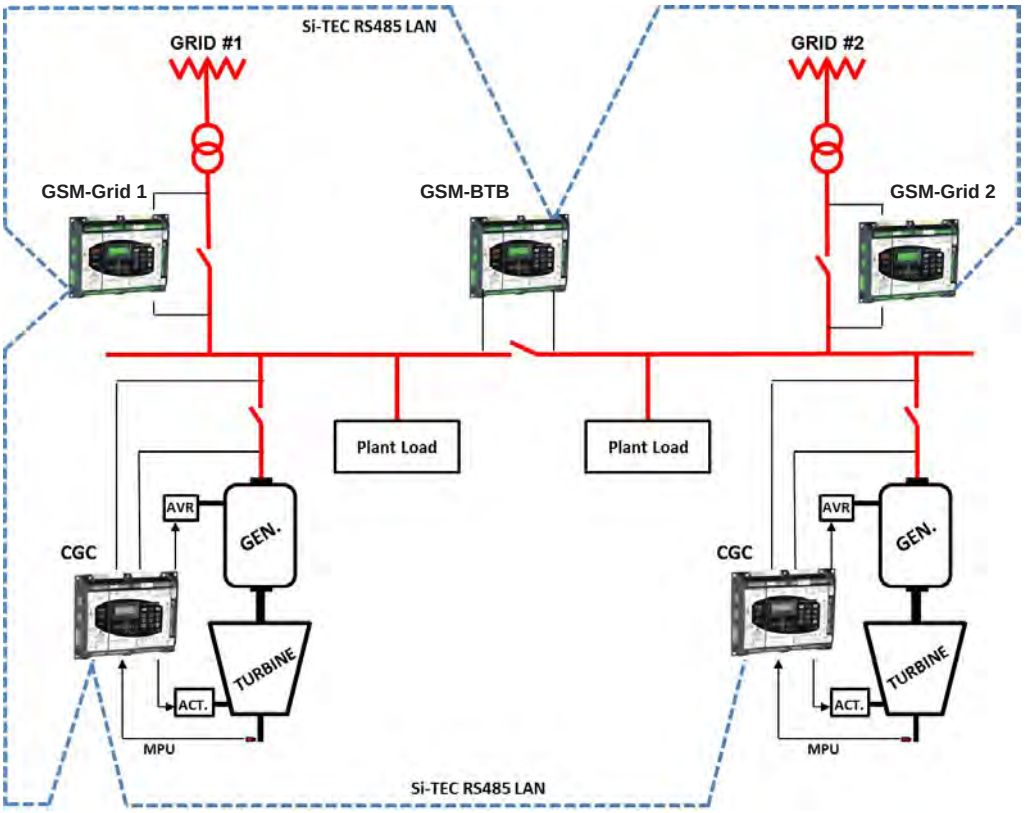
kWatt and kVAr reference control

- Digitally integrates complete power generation system with supply grid system
- kWatt and kVAr digital load sharing by CGC generator units, based on GSM reference control
- Load sharing better than 0.5 % accuracy
- True RMS measurement better than 0.25 % accuracy
- Process Control via reference control of import/export kWatts
- "Bumpless" transfer of active and reactive power upon paralleling or when switching control modes
- Adjustable load/unload ramp rates
- Multi-mode import/export control of kWatts & kVArs/power factor
- Safe operation of grid incomer via import/export kWatt, kVAr and kVA limiting
- Summing control for multiple GSM application
- 4-20 mA and Modbus® communications referencing available

Display features

- 4 x 20 character display, with "back-light flash" feature for active alarms
- Extensive multi-level menus for easy & quick access
- Enhanced keypad for direct menu navigation
- "Short Cut" keys for selected displays
- Peak hold values for import/export kWatts and kVArs, phase currents & vector angle
- Accumulated data including import/export kWatt-hrs and kVAr-hrs, etc.

Si-TEC *Xtend* CGC & GSM used for grid parallel application



I/O features

- 16 logic inputs, with LED status indication, of which 12 are user defined for a wide range of use including, “kWatt Control Mode”, “kVAr Control Mode”, “Process Control”, “Zero Imp/Exp”, “Alarm Reset”, etc.
- 9 relay outputs, with LED status indication, of which 8 are user defined for control or alarm functions

  Typical control functions include:

  – “Grid CB Open”, “Controlling Master”
  – “kWatt Switches 1 & 2”, “Sum kWatt Switch”
  – “kVAr Switches 1 & 2”, “Sum kVAr Switch”
  – “kVA Switch”, “Sum kVA Switch”, etc.
  – Grid failed/restored for auto generator start stop, resync to grid, etc.

  Typical alarm functions include:

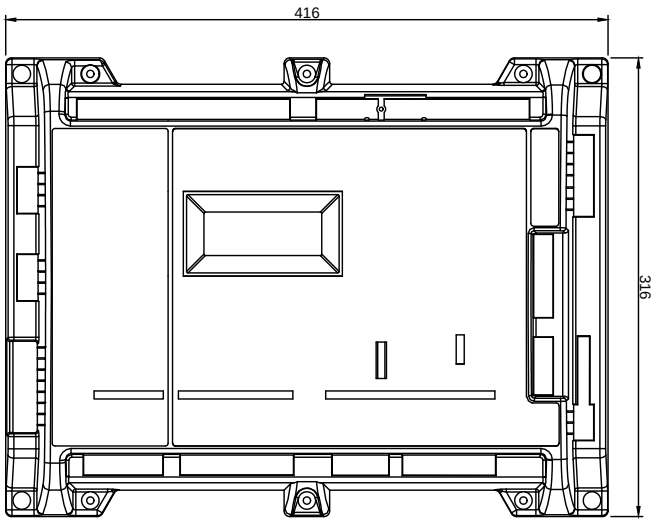
  – “Under/Over Frequency”
  – “Under/Over Voltage”
  – “Vector Disturbance”
  – “High kWatt Import”
  – “High kWatt Export”
  – “High kVAr Import”
  – “High kVAr Export”
  – “DC Supply Volts Low”, etc.
- Individual output relays can have multiple functions by “Combined Alarms”
- Each “alarm” can be selected to directly “Trip” the grid incomer CB
- 4 analogue inputs (3 x 4-20mA, 1 x RTD) for user select applications. E.g. import/export kWatt ref., generated PF ref., process input, process ref.,
- 3 analogue outputs (4-20mA) for direct driving user applications, e.g. kW, kVAr, PF meters, process reference, etc.
- Existing I/Os may be further expanded if required
- I/O connections utilise plug-in terminal strips

Communications

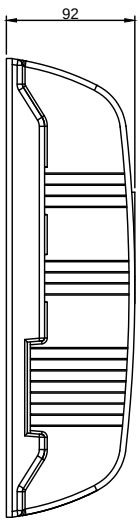
- “RS232 Diagnostic Port” for Si-TEC pc software
- “User RS485 LAN” has read/write facility for a wide range of registers. Standard LAN protocol is either “Modbus” RTU or “Modbus” ASCII.
- “Si-TEC LAN” for inter-module communications for up to 24 Si-TEC *Xtend* units of any type combination
- “CAN Bus” port for I/O expansion, and for other special applications

Dimensional drawing

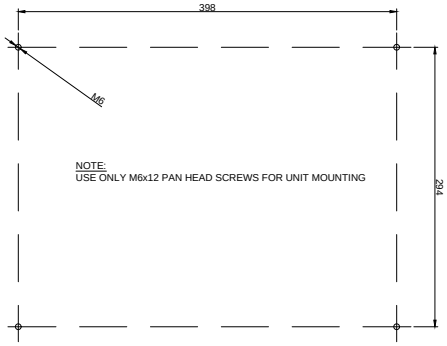
Si-TEC *Xtend* physical outline with dimensions



FRONT VIEW



SIDE VIEW

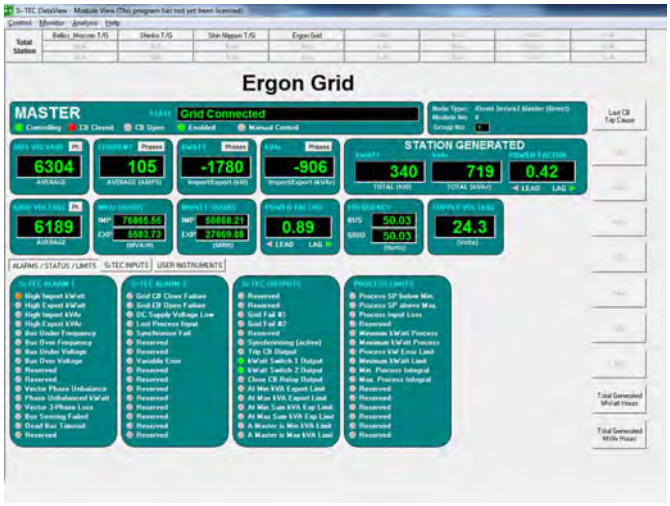


MOUNTING DETAIL

Software tools (Windows® based)

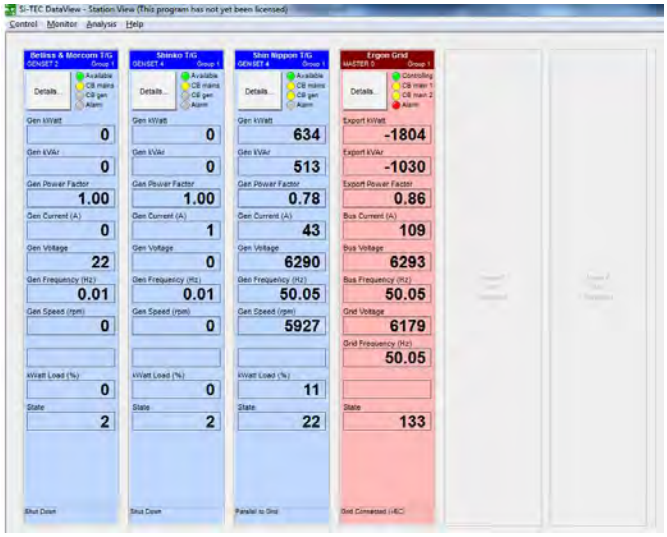
pcConfigure

- Allow storage & retrieval of set point parameters to & from a Si-TEC *Xtend* module via a PC
- Operates in a safe controlled environment
- Saves all set point parameters to disk
- Data can be sent by email
- Data can be printed for archival records
- Menu driven set-up & alarm configuration



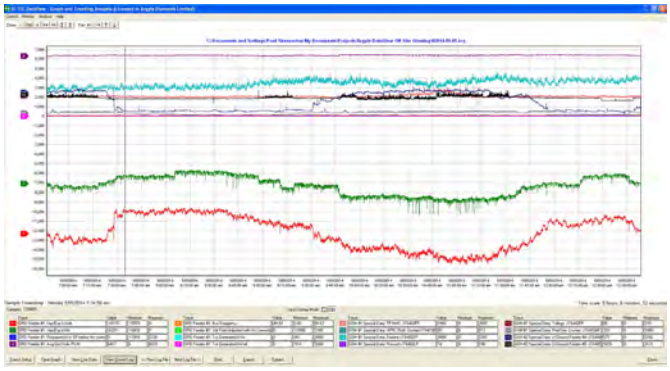
pcTune

- Allows tuning to be performed remotely and in a controlled environment
- Allows generator tuning to be performed with increased accuracy in true engineering values
- Provides 100 % repeatable results
- Recovery characteristics tested by inducing errors and recording results graphically
- 16 traces of user selected digital values can be selected for display
- Multiple PID tuning menus
- Digital instrument panel included



PSMS Monitoring System (for custom projects)

- Power Station Monitoring System for PC – preconfigured for up to 24 generators
- Data extracted directly using RS485 “User” port
- Operates independent of the system PLC



Si-TEC DataView

- High speed power station monitoring system for PC, configurable for up to 24 nodes (including CGC, GSM, ADG, temp scanner, feeders, etc.)
- Includes extensive data logging (up to 100 data per node), event recording, and archiving (up to several years)
- Data extracted via Modbus RS485 or Ethernet (Modbus TCP/IP)
- Exporting of log file via CSV format for up to 20 parameters
- Operates independent of PLC/SCADA

Heinzmann Australia Pty Ltd | 10 Virginia Street | Geebung QLD 4034 | Australia | Phone +61 7 3868 3333
info.au@heinzmann.com | **www.heinzmann.com.au**