Power Management Application Guide

January 2026

WOODWARD

EASYGEN 3000^XT

WOODWARD | EASYGEN 3000^XT

🇺🇸 English

Customer Value ⌄ Products ⌄ **Download + Support** Accessories Contact 🔍

Downloads + Support

Knowledgebase & FAQ

Documentation *server*
- CAD files (2D / 3D / EPlan)
- software / configuration files
- manuals / modbus protocol .xls / …

[Software Tools]

[Configuration Files]

[Application Notes]

[YouTube Channel]

[Company Certifications]

News

Support *server*
- firmware upgrades
- trainings, …

[Webinar Recordings]

[Training Presentations]
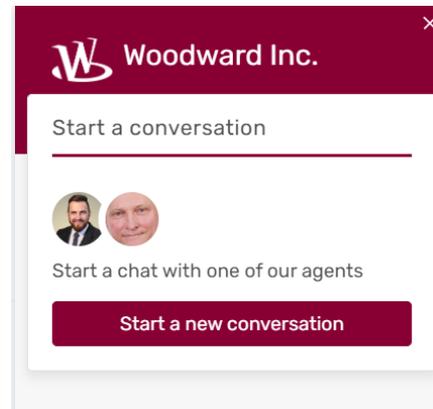
[substitute products]

Contact us

Legacy *server*
- product support statements
- old device documentation

[replacing old devices]

WOODWARD Inc. ✕

Start a conversation

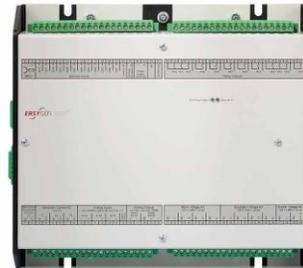Start a chat with one of our agents

[Start a new conversation]

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scan to learn more
http://easYgen.org/download

quick introduction clip

Which easYgen-3000XT for which application?

easYgen-3100XT/3200XT

> 8440-2081

> 8440-2082

> 8446-1071/-72/-73
  > easYview (7", 10", 15")
  > Remote Touch panel

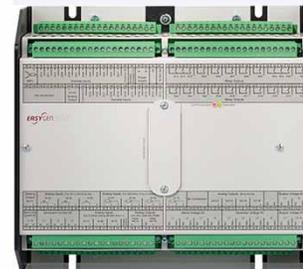**easYgen-3400XT/3500XT-P1**
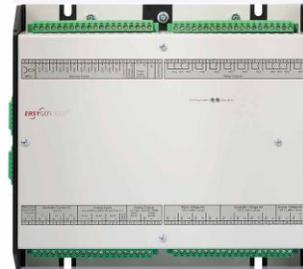
> 8440-2084

> 8440-2085

easYgen-3400XT/3500XT-P2

> 8440-2087

> 8440-2088

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Main differences of different versions

easYgen-3100XT/3200XT

› Synchronization GCB, MCB, Generator/Engine/Mains protection

› 2 x CANBus, 1 x RS485 & 1xE-Net Modbus TCP

› 3 x flexible PID's for speed & voltage bias

› 2 PT bus sensing Mains sensing

› Loadsharing via E-Net and/or CANopen, ModbusMaster, redundant control 2.17

easYgen-3400XT/3500XT-P1

› Synchronization GCB, MCB, +GGB, +Run-up Synch, +LS-6XT, GC3400XT Support +690VAC sensing, +inbuilt AVR Regulation

› 3 x CANBus, 1 x RS485 & 3 x E-Net Modbus TCP

› 3 x flexible PID's for speed and voltage bias

› 2 PT bus sensing Mains sensing

› Loadsharing via redundant E-Net or CANopen, ModbusMaster, redundant control 2.17

easYgen-3400XT/3500XT-P2

› Synchronization GCB, MCB, +GGB, +Run-up Synch, +LS-6XT, GC3400XT Support +690VAC sensing, + inbuilt AVR Regulation

› 3 x CANBus, 1 x RS485 & 3 x E-Net Modbus TCP

› 3 x flexible PID's for speed and voltage bias

› 3 PT bus sensing for rotation check, Mains sensing

› Second board with additional digital/analog I/Os, pulse outputs for kWh & kVArh

› Loadsharing via redundant E-Net or CANopen, ModbusMaster, redundant control 2.17

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easYgen-3000XT redundant control solution

Starting with software release 2.17, all easYgen-3000XT catalog packages (8440-2081 through 8440-2088) will include redundant functionality, allowing the use of two controllers for each genset. LS-612XT-P1/P2 redundant functionality available end of 2025

› Cold Redundancy
  › Backup system is off and inactive
  › Requires manual or automated start-up

› Warm Redundancy
  › Backup system is on but in standby mode
  › Faster switch-over than cold redundancy

› Hot Redundancy
  › Backup system runs in parallel with the primary system
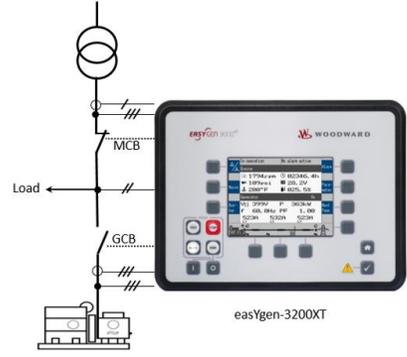 › Immediate failover with minimal downtime
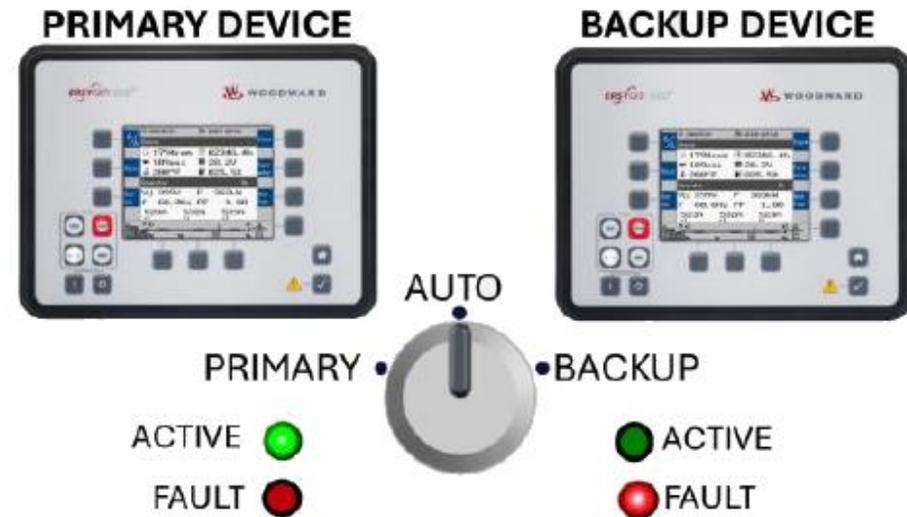
[Download here 45026 Application Note](#)

[Download Case Study](#)

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Typical easYgen-3200XT Use Cases
one part number fits all

easYgen-3200XT use cases

Typical Datacenter Application

Medium Voltage

easYgen-3200XT can used in this application to parallel the Generator breakers only (GCB's)
The other breakers (light blue lines) are controlled by 3rd parties e.g. PLC and external synchronizers

Genset packager scope only providing the gensets

Low Voltage

.. n+1 ..   .. n+1 ..   .. n+1 ..

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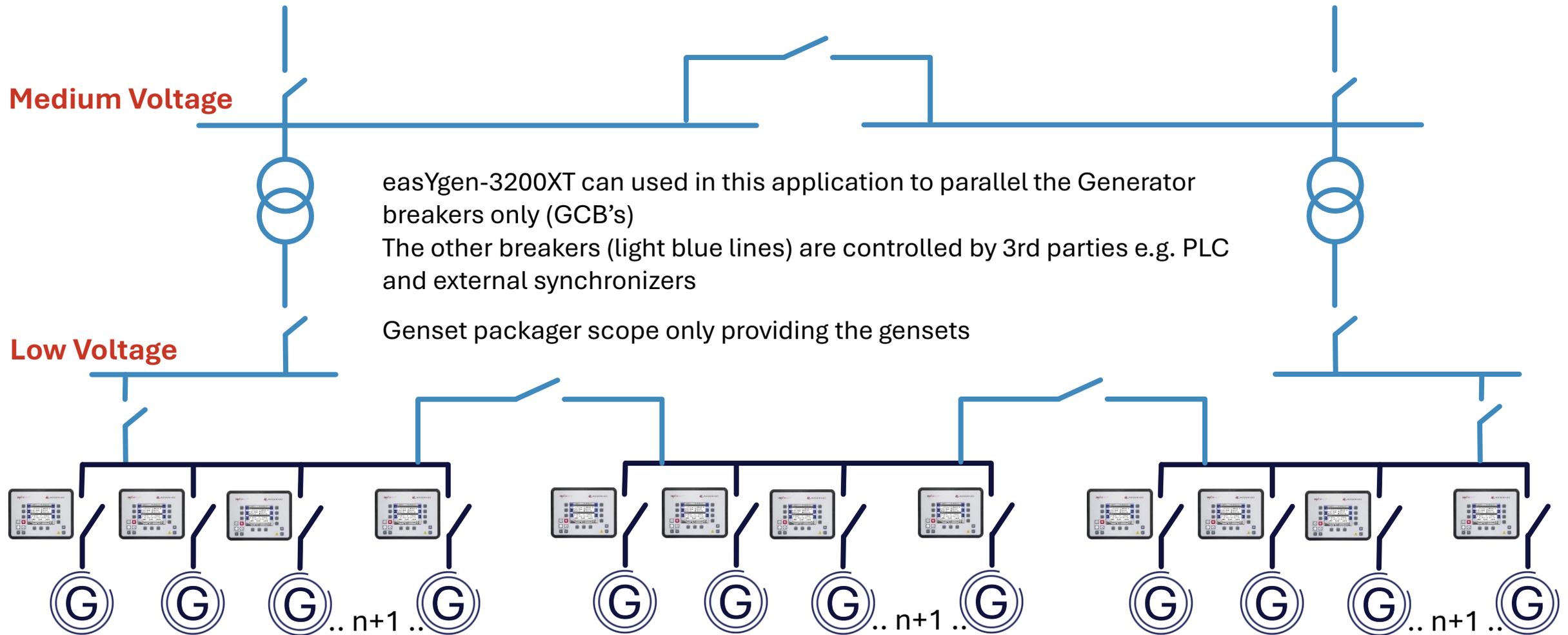
Typical easYgen-3500XT Use Cases
one part number fits all

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Executed Datacenter Project

Medium Voltage

Low Voltage
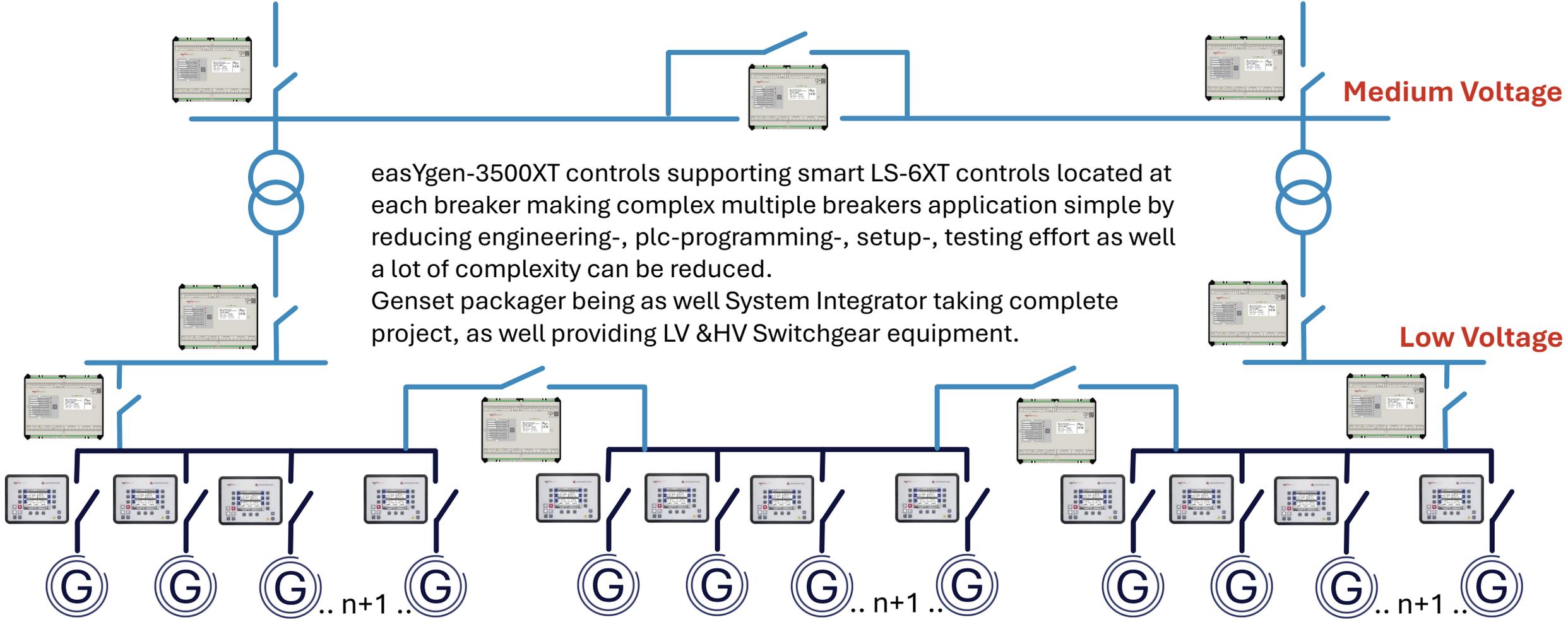
easYgen-3500XT controls supporting smart LS-6XT controls located at each breaker making complex multiple breakers application simple by reducing engineering-, plc-programming-, setup-, testing effort as well a lot of complexity can be reduced.
Genset packager being as well System Integrator taking complete project, as well providing LV &HV Switchgear equipment.

.. n+1 ..

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LS-612XT-P1

A LS-612XT-P1 controller is a smart Synchronizer transferring true RMS voltages via redundant E-net/CANopen to the easYgen-3400/3500XT genset controllers taking care of GCB and providing this information then to engine and generator controls to parallel other circuit breakers (MCB's, GGB's-T-couplers) within the application.

As well LS-612XT's and easygen controllers taking care of segmentation.

LS6XT has three measurement system: System A, auxiliary voltage and System B capable to serve one or two breakers.

> 8446-1071/-72/-73
> > easYview (7", 10", 15")

> 8440-2222
> > LS-612XT-P1

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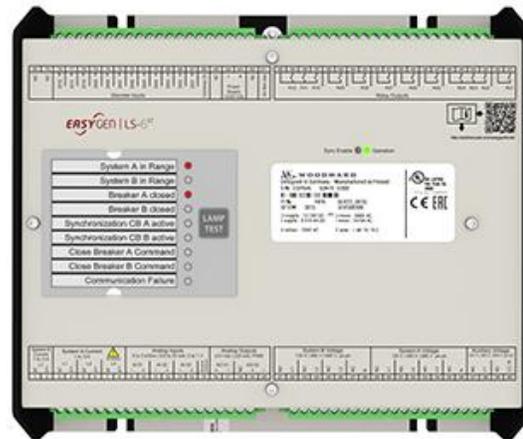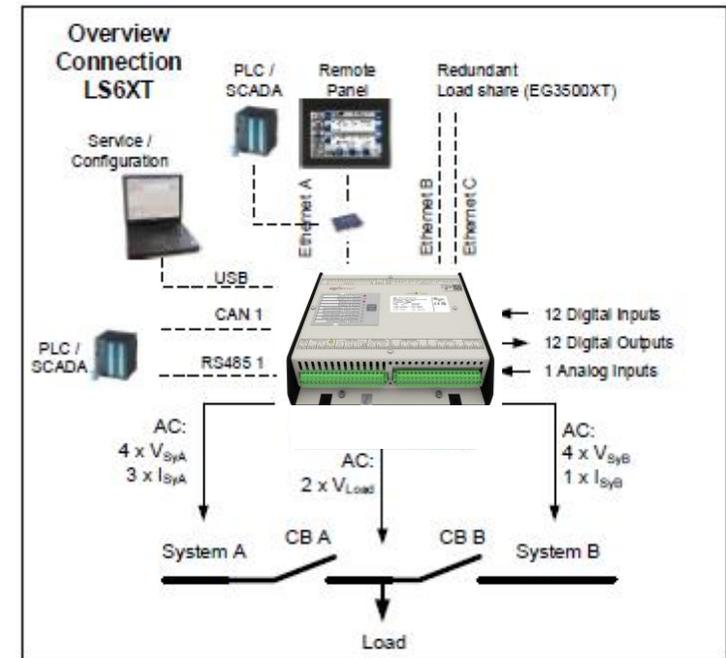
8440-2222 LS-612XT-P1 Application Overview
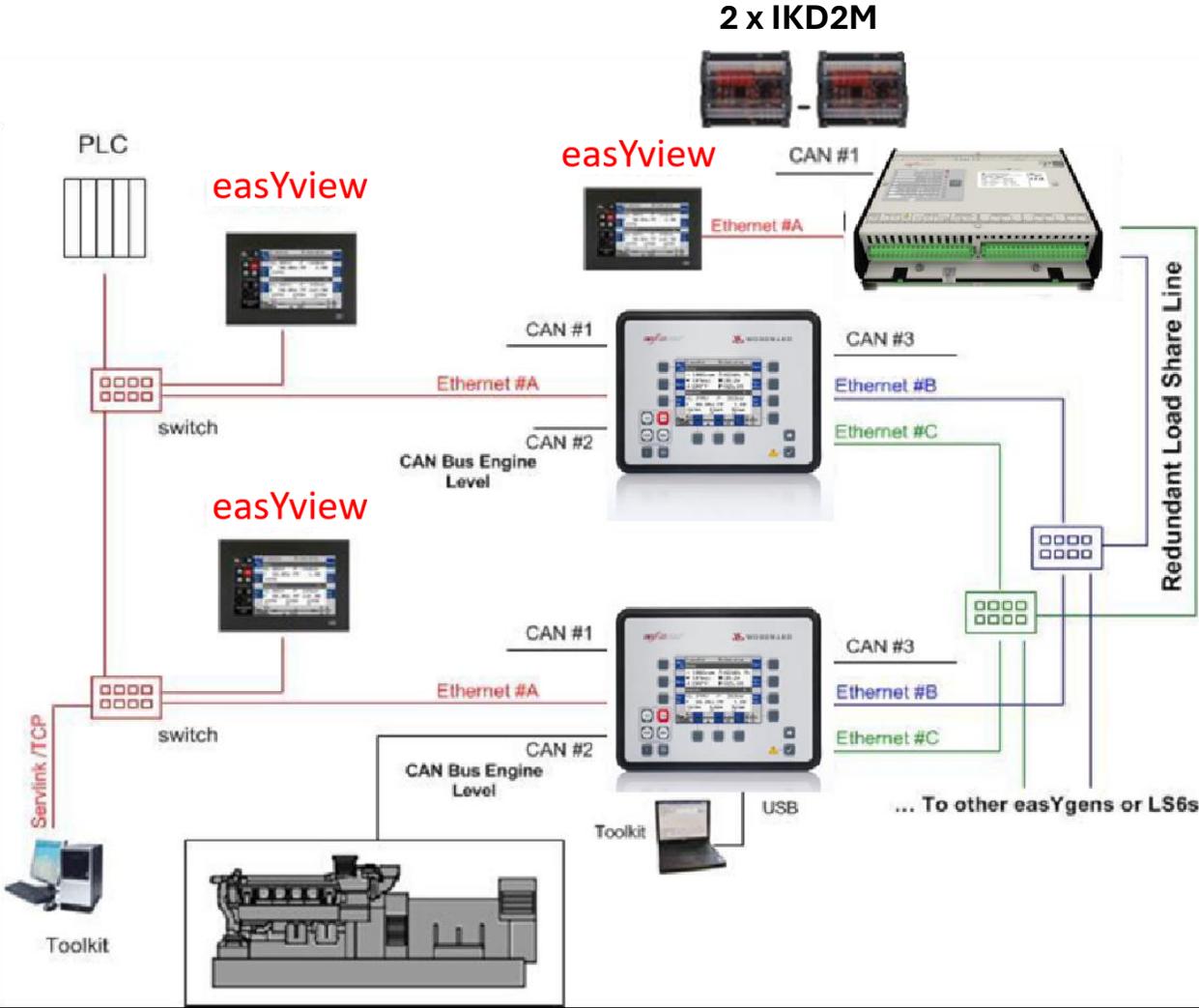
8440-2317 LS-612XT-P2 Application Overview
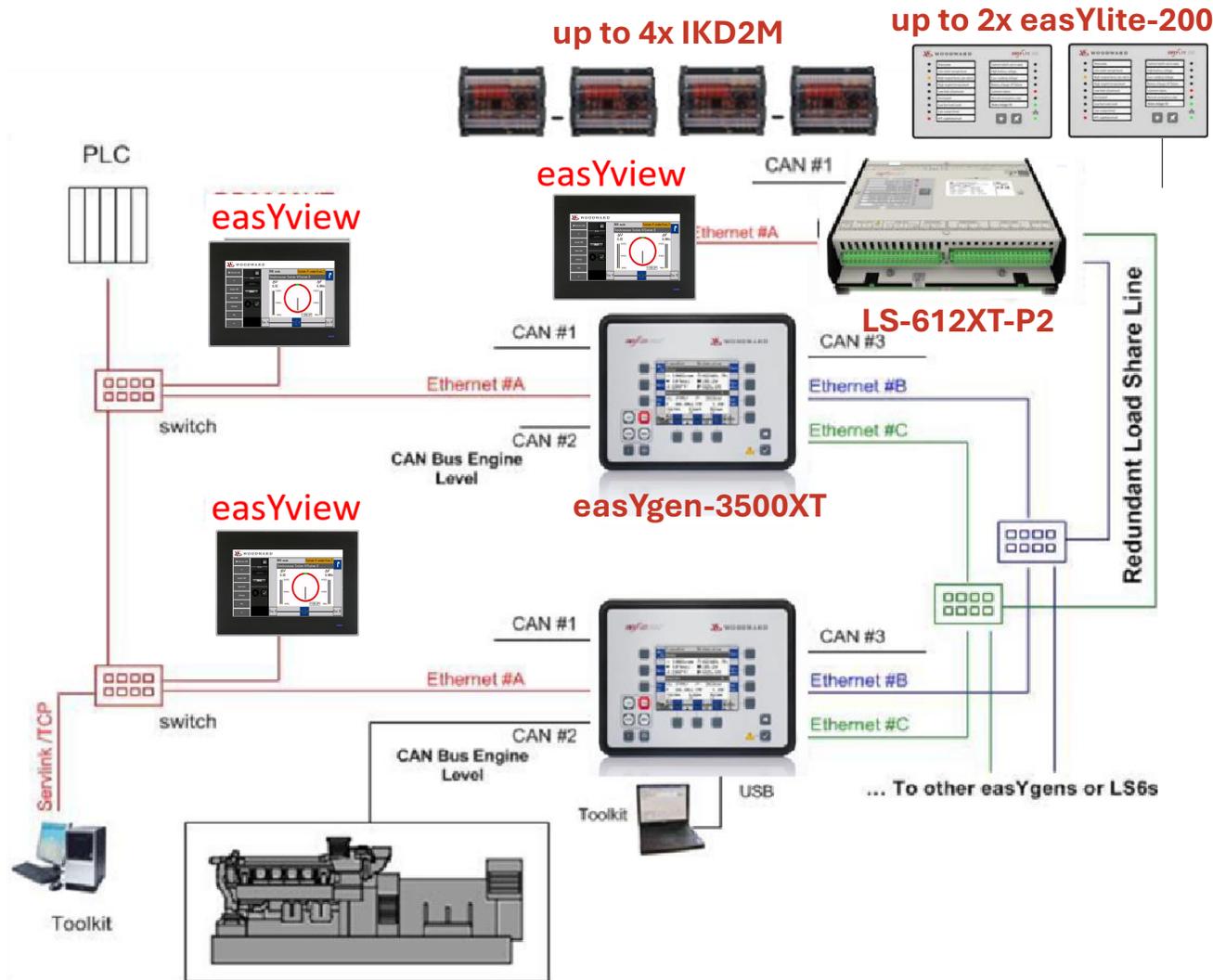
Additional to LS-612XT-P1

> up to 4 IKD2M (32DI/32DO)
> up to 2 easYlite-200

> Comfortable Current protection
>> Instantanoues overcurrent 1/2/3 (50)
>> inverse time overcurrent (51)
>> voltage restraint overcurrent (50V/51V)
>> Directional Overcurrent protection (67)

> Load Protection
>> overload import level 1/2
>> overload export level ½
>> Unbalanced load (46)

>> Active synchronization to be used as independent paralleling control

> ABS & LR marine approval

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Other LS-612XT-P2 use cases

ATS closed transition active back synch
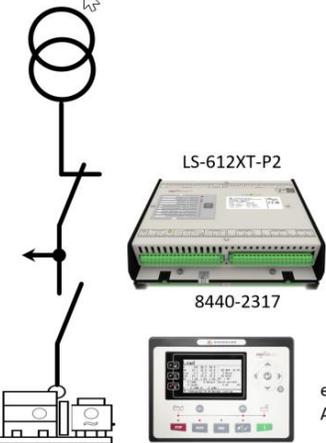
- Mains Failure detection
- ATS Mains to Generator supply
- Active speed& voltage biasing genset for faster closed transition

LS-612XT-P2

8440-2317

easYgen-800
Auto Start Control

LS-612XT-P2 for Hydro Application

LS-612XT-P2

8440-2317
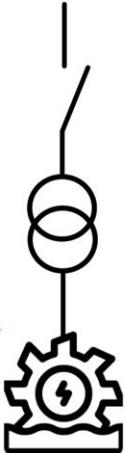
Mainsprotection
Synchronizer
Transformer Vectorgroup
0-359° adjustment
Generatorprotection

easYview

505HT Hydro Turbine control

ProTech GII Overspeed Protection

LS-612XT-P2 for vessel shore connection

LS-612XT-P2

8440-2317

ANSI 32R reverse power
ModbusTCP Telegram Mapper
More additional external I/Os

easYgen-3500XT-P2

8440-2088

easYgen-3500XT-P2

8440-2088

easYgen-3500XT-P2

8440-2088

[Download Case Study](#)

LS-612XT-P2 use case marine paralleling

LS-612XT-P2
synchronizer

8440-2317   2301E
speed control &load sharing

8273-1019

ABS

Lloyd's Register

LS-612XT-P2
synchronizer

8440-2317   2301E
speed control &load sharing

8273-1019

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Pre-Defined LS-612XT Application Modes

A05 GCB/GGB	n+1 generators	island operation only	GCB & GGB operation
A06 GCB/GGB/MCB	n+1 generators	island/one mains operation	GCB & GGB & MCB operation
A08 GCB/L-MCB	n+1 generators	island/one mains operation	GCB L-MCB with LS511/521
A09 GCB/GGB/L-MCB	n+1 generators	island/one mains	GCB, GGB, L-MCB with LS511/521
A10 GCB/L-GGB	n+1 generators	island operation only	GCB, L-GGB with LS511/521
A11 GCB/L-GGB/L-MCB	n+1 generators	island/one mains only	GCB, L-GGB and L-MCB with LS511/521
A12 GCB/L-GGBMCB	n+1 generators	island/one mains operation	GCB, L-GGBMCB with LS512/522

In above App Modes all the segmenting is already pre-configured

A07 GCB/LSx	n+1 generators	island and/or n+1 mains operation	LS511/512/521/522/LS6XT
A13 GCB/GC	GC-3400XTP1		

› Segmenting must be done individual according the application
› Every breaker which must be synchronized requires a LS-6XT controller
› When using 2 breaker mode in LS-6XT, the load must be always between the two LS-612XT breakers. It is not allowed to receive power (source) between the two breakers, if so, place 2 x LS-612XT in one breaker mode.
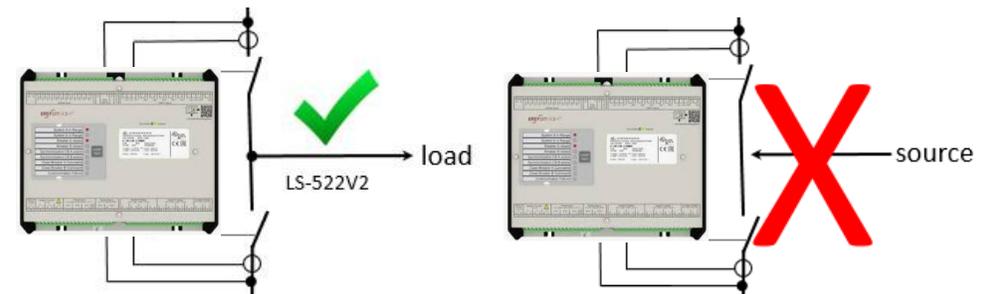
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easYgen-3500XT use cases

easYgen-3500XT GGB Support Island Mode

load

GGB

GCB   GCB

easYgen-3500XT   easYgen-3500XT
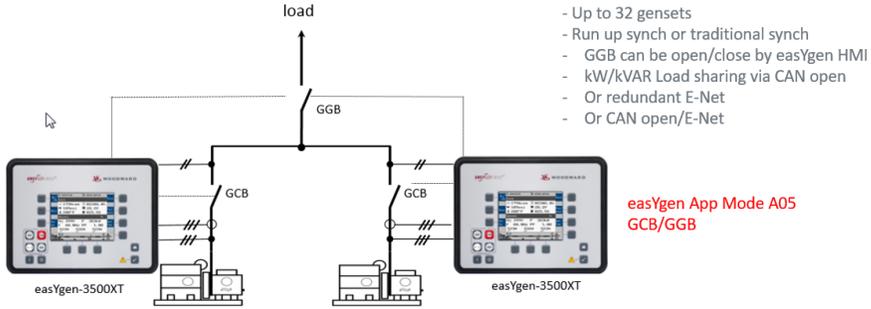
- Up to 32 gensets
- Run up synch or traditional synch
  - GGB can be open/close by easYgen HMI
  - kW/kVAR Load sharing via CAN open
  - Or redundant E-Net
  - Or CAN open/E-Net

easYgen App Mode A05
GCB/GGB

easYgen-3500XT GGB Support Island & Mains Mode

MCB

load

GGB

GCB   GCB

easYgen-3500XT   easYgen-3500XT

easYgen App Mode A06 GCB/GGB/MCB
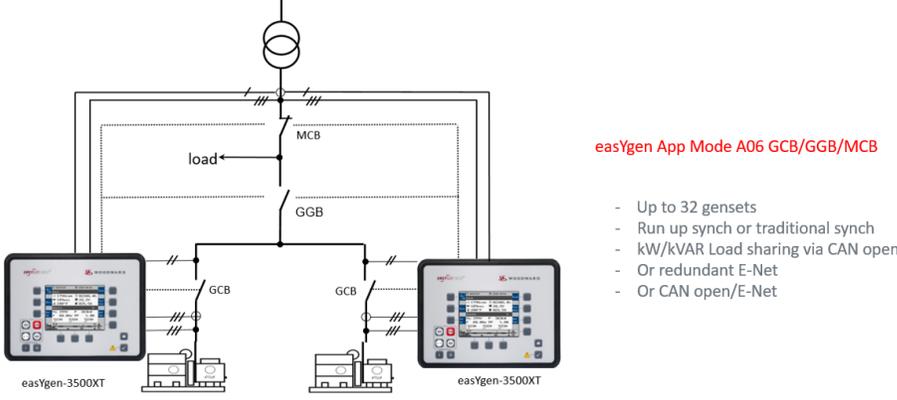
- Up to 32 gensets
- Run up synch or traditional synch
- kW/kVAR Load sharing via CAN open
- Or redundant E-Net
- Or CAN open/E-Net

Multiple gensets island mode GGB

load

LS-6XT

L-GGB

GCB   GCB

easYgen-3500XT   easYgen-3500XT
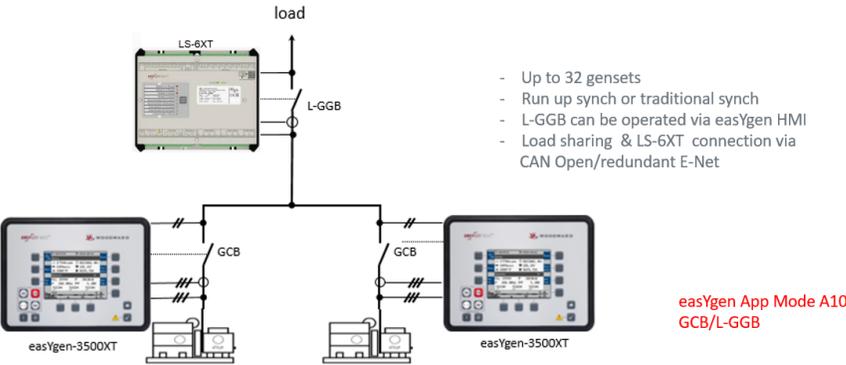
- Up to 32 gensets
- Run up synch or traditional synch
- L-GGB can be operated via easYgen HMI
- Load sharing & LS-6XT connection via CAN Open/redundant E-Net

easYgen App Mode A10
GCB/L-GGB

Multiple Gensets only one MCB

LS-6XT

L-MCB1

Load

GCB   GCB

easYgen-3500XT   easYgen-3500XT
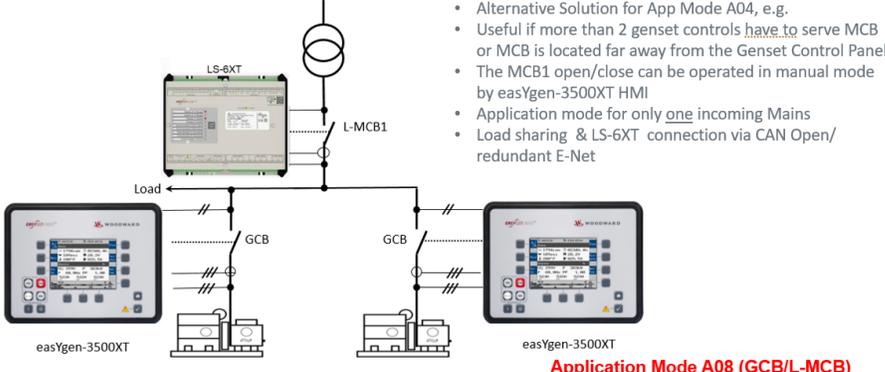
- Alternative Solution for App Mode A04, e.g.
- Useful if more than 2 genset controls have to serve MCB or MCB is located far away from the Genset Control Panel
- The MCB1 open/close can be operated in manual mode by easYgen-3500XT HMI
- Application mode for only one incoming Mains
- Load sharing & LS-6XT connection via CAN Open/ redundant E-Net

Application Mode A08 (GCB/L-MCB)

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easYgen-3500XT use cases

easYgen-3500XT GGB Support Island & Mains Mode

LS-6XT
L-MCB
load
L-GGB
GCB
GCB
easYgen-3500XT
easYgen-3500XT

easYgen App Mode A11 GCB/L-GGB/L-MCB

- Up to 32 gensets
- Run up synch or traditional synch
- For one Mains, L-MCB and L-GGB can be operated by easYgen HMI
- Load sharing & LS-6XT connection via CAN Open/ redundant E-Net

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easYgen-3500XT GGB Support Island & Mains Mode

LS-6XT
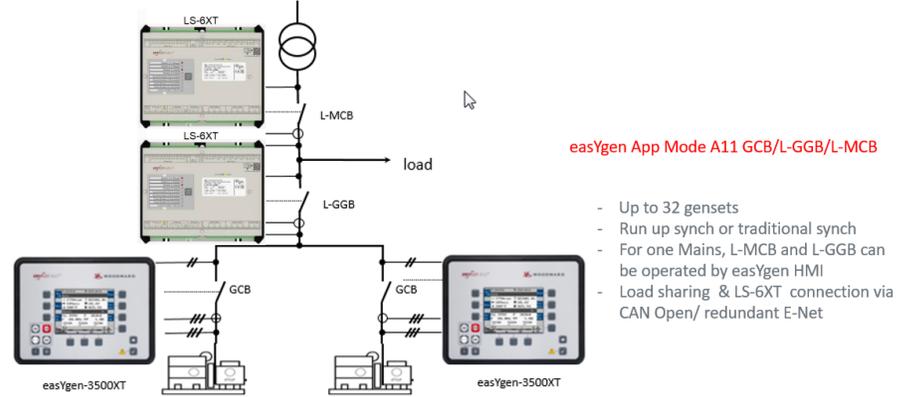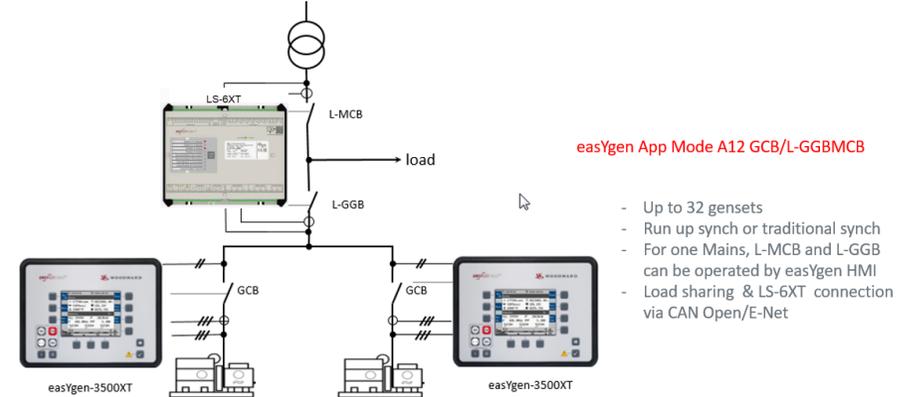L-MCB
load
L-GGB
GCB
GCB
easYgen-3500XT
easYgen-3500XT

easYgen App Mode A12 GCB/L-GGBMCB

- Up to 32 gensets
- Run up synch or traditional synch
- For one Mains, L-MCB and L-GGB can be operated by easYgen HMI
- Load sharing & LS-6XT connection via CAN Open/E-Net

Multiple Gensets only one MCB & one GGB

LS-6XT
L-MCB1
Load
GGB
GCB
GCB
easYgen-3500XT
easYgen-3500XT

- The GGB and MCB1 open/close can be operated in manual mode by easYgen-3500XT HMI
- Application mode for only one incoming Mains
- Load sharing & LS-6XT connection via CAN Open/redundant E-Net

Application Mode A09 (GCB/GGB/L-MCB)

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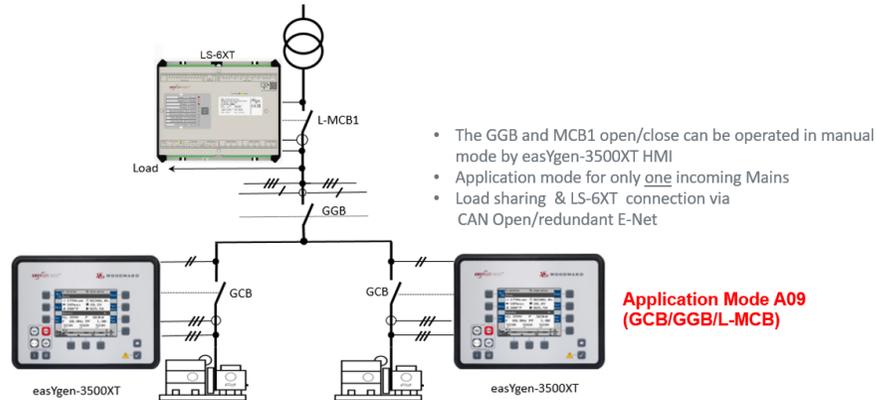
easYgen-3500XT Multiple breaker application

N+1 mains
LS-6XT
LS-6XT
MCB1
MCB2
T-Coupler
Load
LS-6XT
Load
GCB
GCB
easYgen-3500XT
easYgen-3500XT

- easYgen is only serving GCB
- Every other breaker to be synchronized is equipped with a LS-6XT control
- Load sharing & LS-6XT connection via CAN Open/ redundant E-Net

Application Mode A07 (GCB/LSx)

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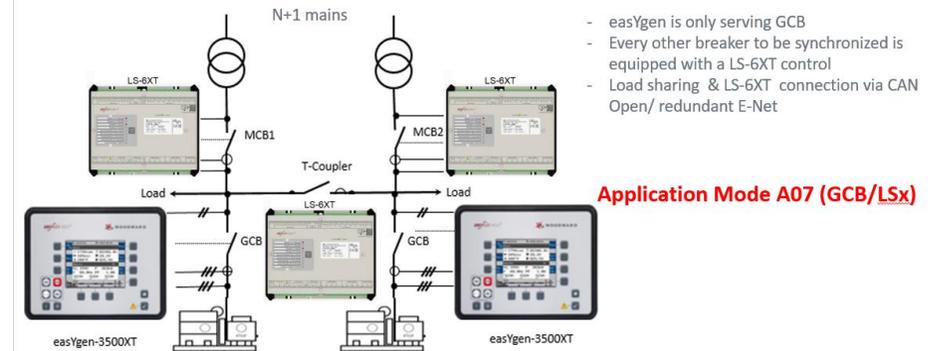
You have requirement to control and manage

› more than 32 generators

› more than 32 breakers

› more than 64 Segments?

Then Group Controller GC3400XT is a solution

GC3400XT-P1 Group Controller

› 8440-2267

› Allows you to standardize on one solution to fit a multitude of applications

› Runup-Sync and E-Net Modbus Master supported

› Proven system for managing large power generation systems

   › multiple generators (>2.0) up to 496 generators supported in 16 groups each up to 31 generators)

   › In a group of (up to 31) or less for modularity

   › Redundant load share communication at each level, 2 x IKD1M can connected to CAN2

› Purpose-built to minimize your effort commanding your power generation assets

› Reduced point-to-point wiring CAN/ETH communication line between all units

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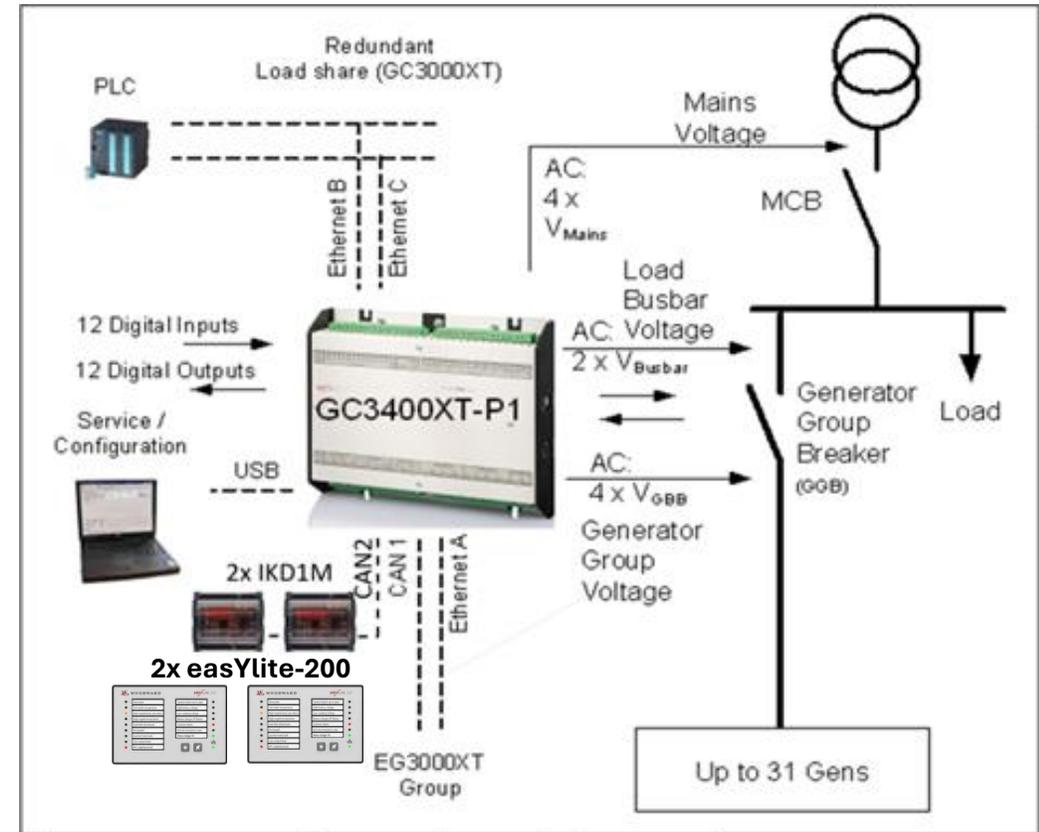
System Architecture
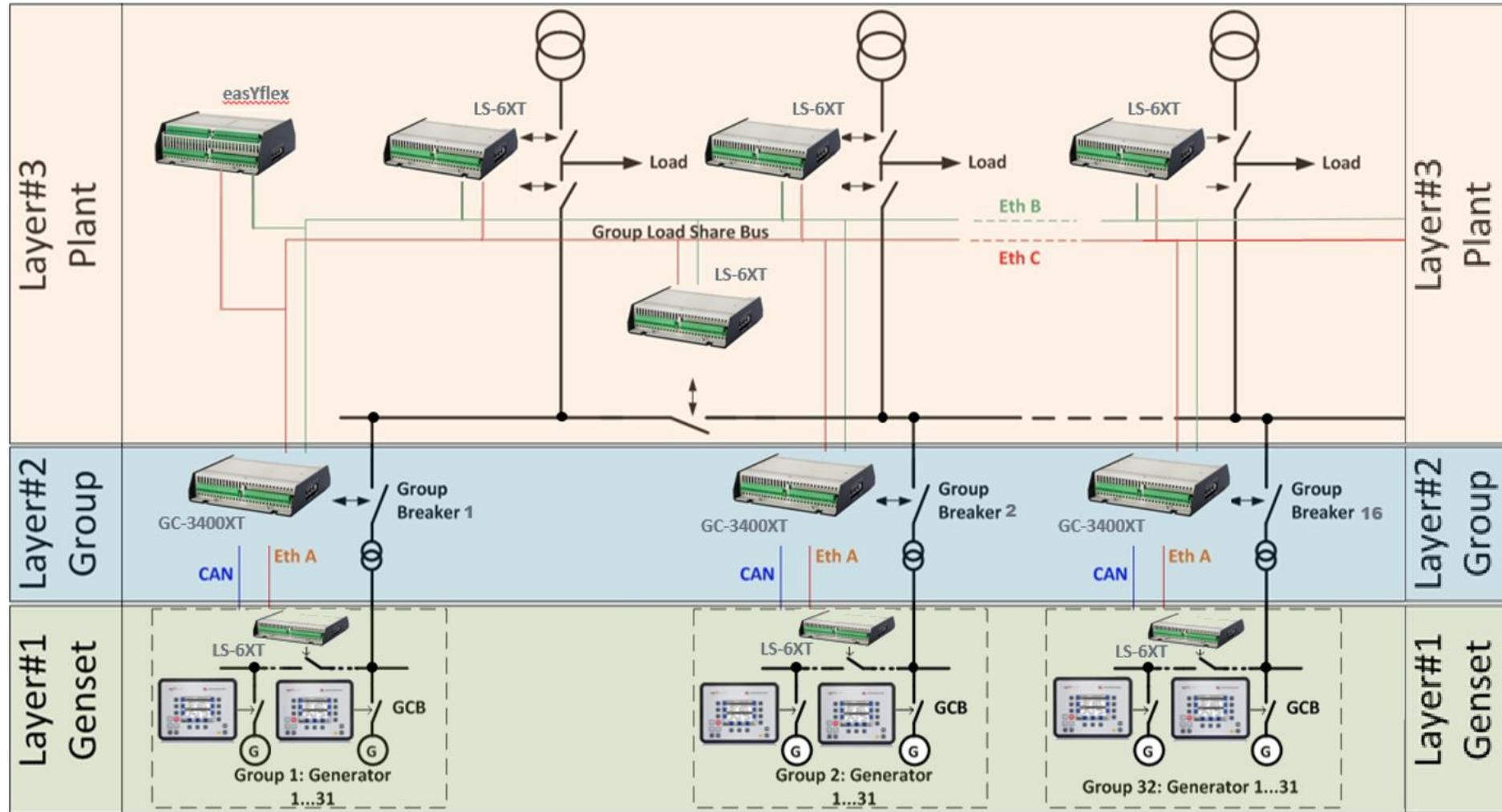
> up to
> > 128 Segments on Layer 3
> > 64 LS6XT's total Layer 3

> up to
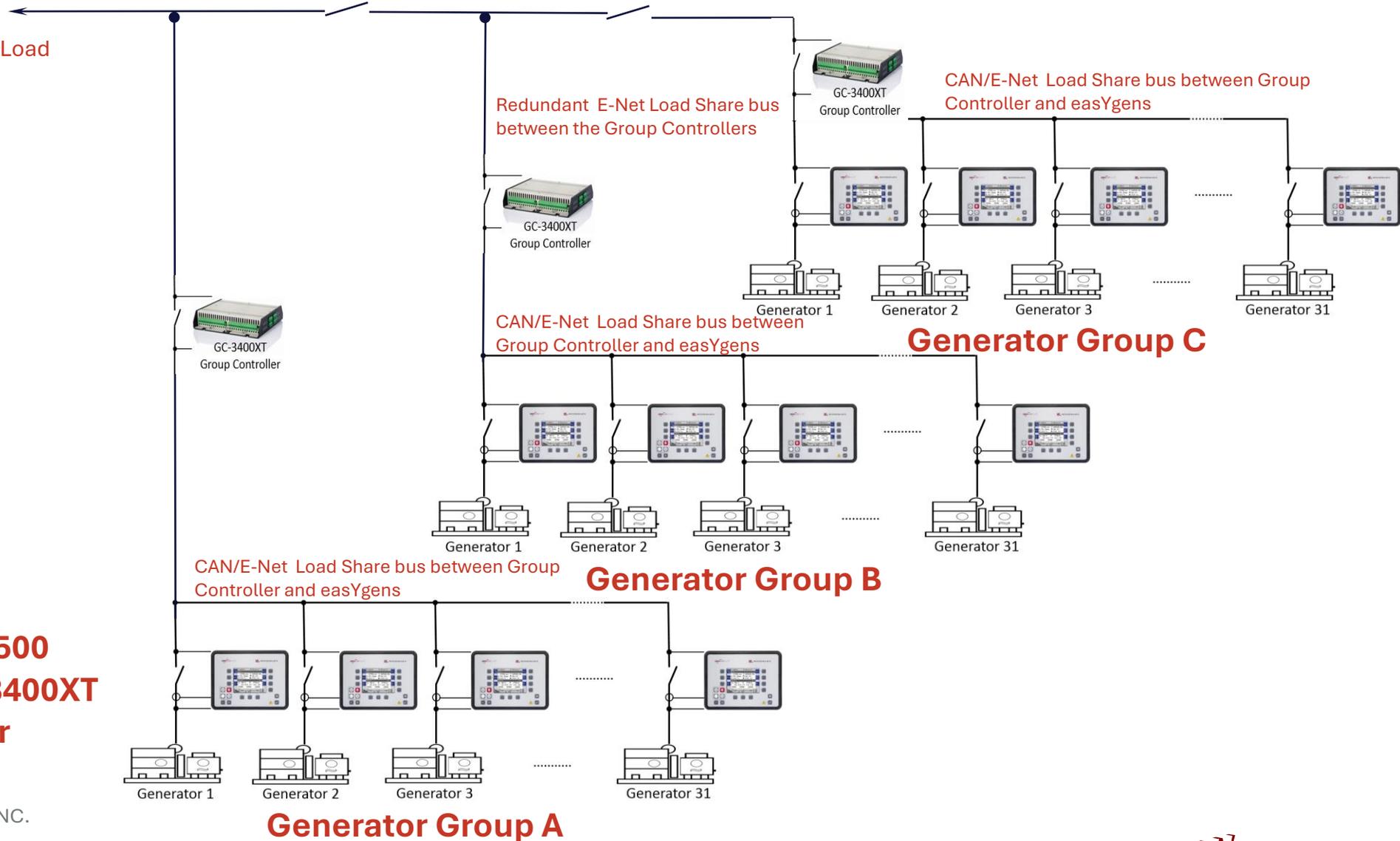> > 16 GC-3400XT's

> up to
> > 64 Segments on Layer 1
> > 31 easYgens in each GC-3400XT Group

Use Case Critical Power Application

Load

GC-3400XT
Group Controller

Redundant E-Net Load Share bus between the Group Controllers

CAN/E-Net Load Share bus between Group Controller and easYgens

Generator Group C

Generator 1   Generator 2   Generator 3   Generator 31

GC-3400XT
Group Controller

CAN/E-Net Load Share bus between Group Controller and easYgens

Generator Group B

Generator 1   Generator 2   Generator 3   Generator 31

GC-3400XT
Group Controller

CAN/E-Net Load Share bus between Group Controller and easYgens

easYgen-3400/3500 supporting GC-3400XT Group Controller

Generator Group A

Generator 1   Generator 2   Generator 3   Generator 31

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Group Controllers balancing 3 HFO power plants

Load

Load

Load

LS-6XT

LS-6XT

GC3400XT-P1

Power Plant B

LS-6XT

GC3400XT-P1

GC3400XT-P1

Power Plant A

Power Plant C

Generator 1   Generator 2   Generator 3   Generator 31

Generator 1   Generator 2   Generator 3   Generator 31

Generator 1   Generator 2   Generator 3   Generator 31

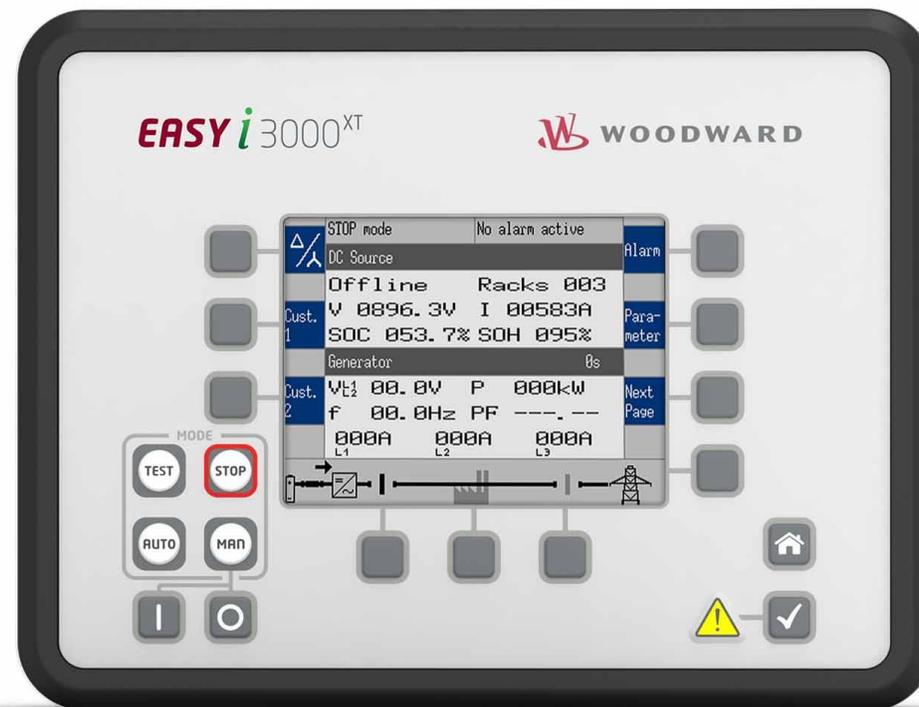WOODWARD
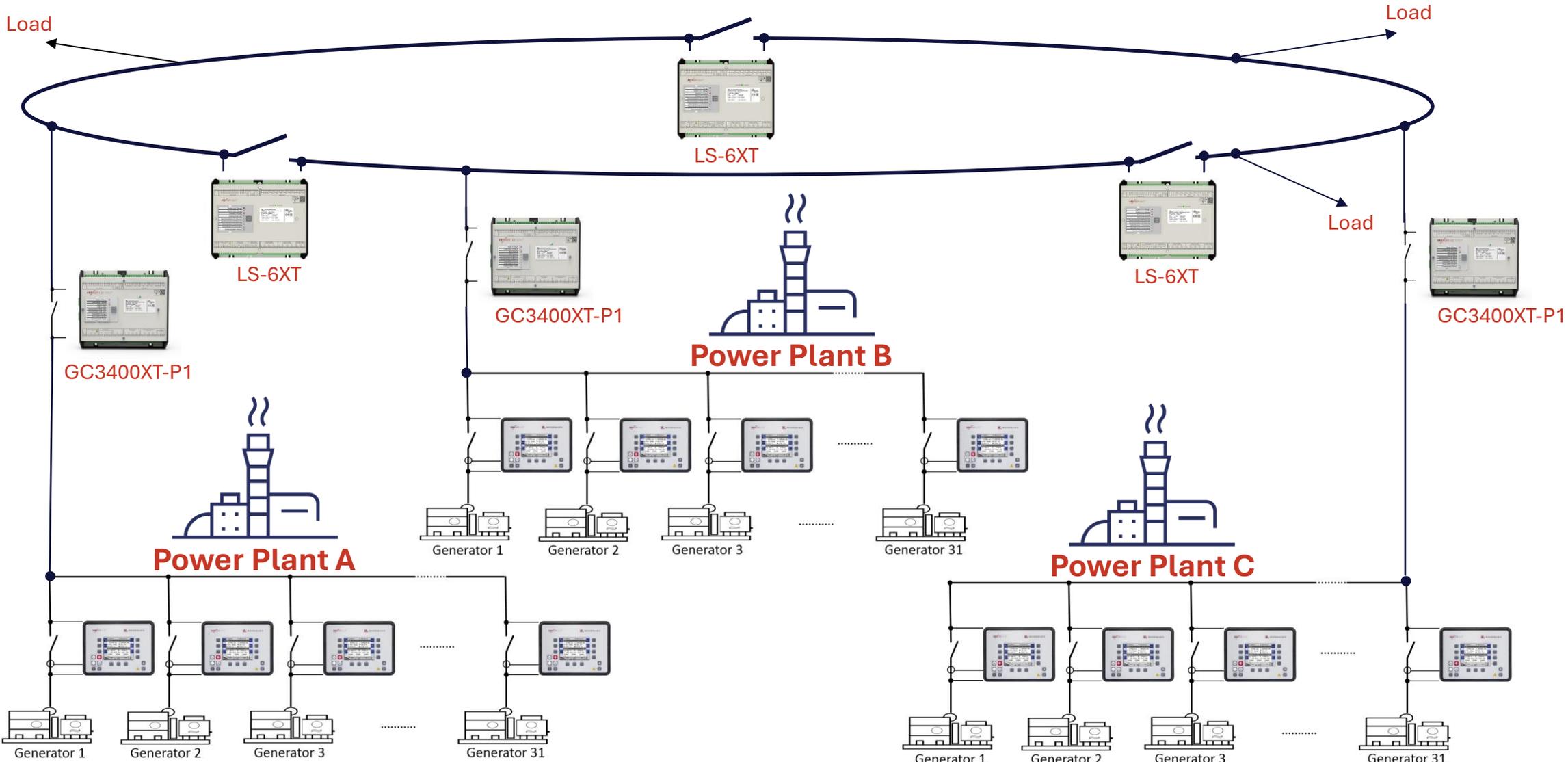
easY-I for inverter based sources

The easY-I-3000XT series takes care about a DC/AC Inverter and connected DC source. The control units can be used in island/mains parallel operation in conjunction with some gensets and is also applicable for stand-by, AMF, peak shaving, import/export or DC charging. Of course, these functions must also be supported by the inverter used.

Seamless integration of easY-I with other easYgen-3000XT platform controls like easYgen-3500XT, LS-6XT and GC-3400XT controls via integral redundant E-Net communication.
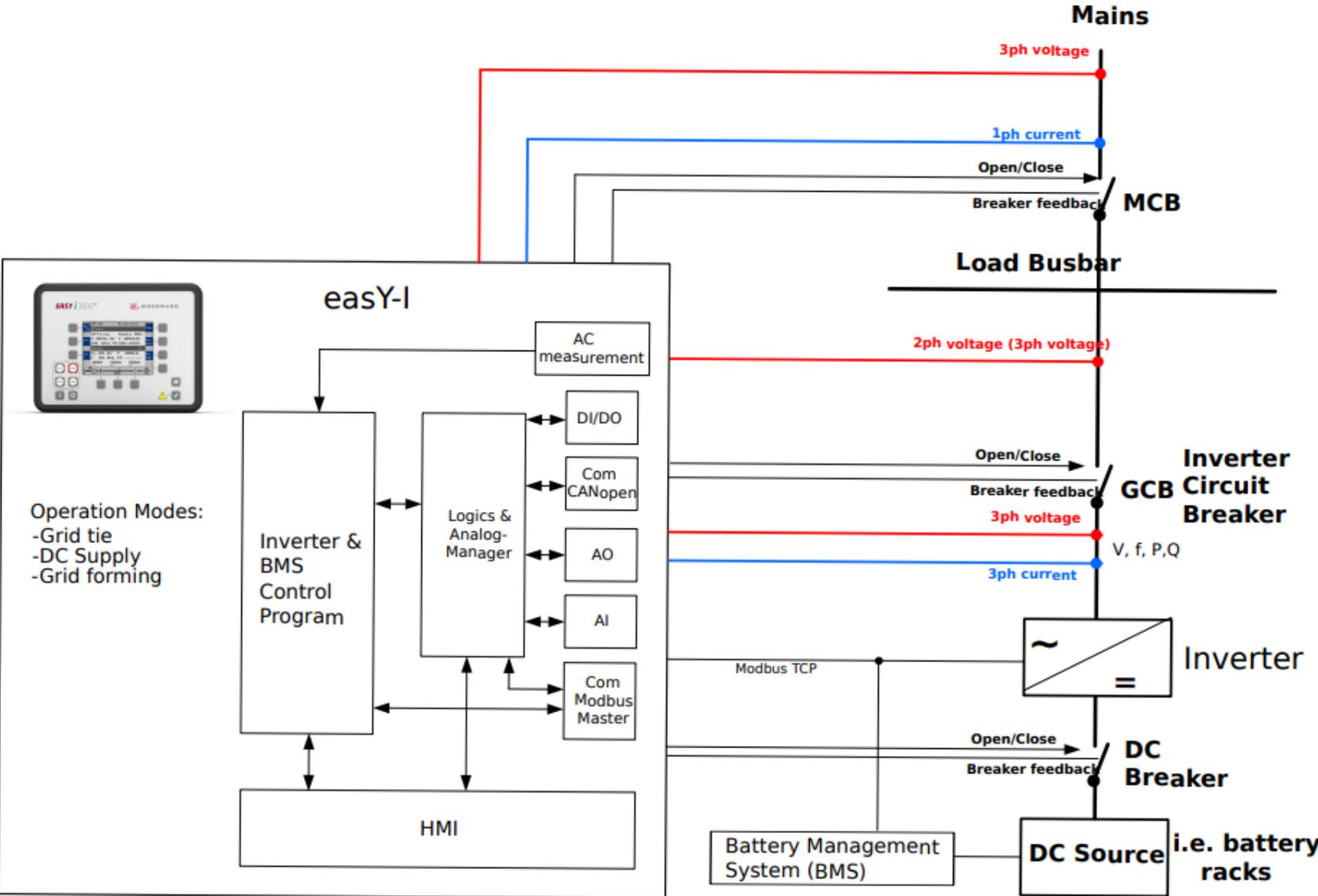
[Download Case Study](http://www.easYgen.org/easYI)

scan to learn more
www.easYgen.org/easYI

Woodward easY-I part numbers:
8440-2292 easY-I-3500XT-P1 and 8440-2293 easY-I-3400XT-P1

easY-I

easYview SCADA Release 3.0

Part number	Description	Screen size	CDDs	MirrorNodes	Data Sources
8446-1071	easYview-07-030	7''	30	1500	3
8446-1072	easYview-10-150	10''	150	9000	18
8446-1073	easYview-15-150	15''	150	9000	18

CDDs: Data points/values which are show in the Visualization at the same time per created page.

MirrorNodes: Datapoint which receive a value from a data source and save it in the project for use in the Visualization

Data sources: Atvise Connect is used as data source in the easYview to receive ModbusTCP data from the easYgen-3000XT/LS-6XT devices. A data source could also be any device which shall communicate with the easYview.

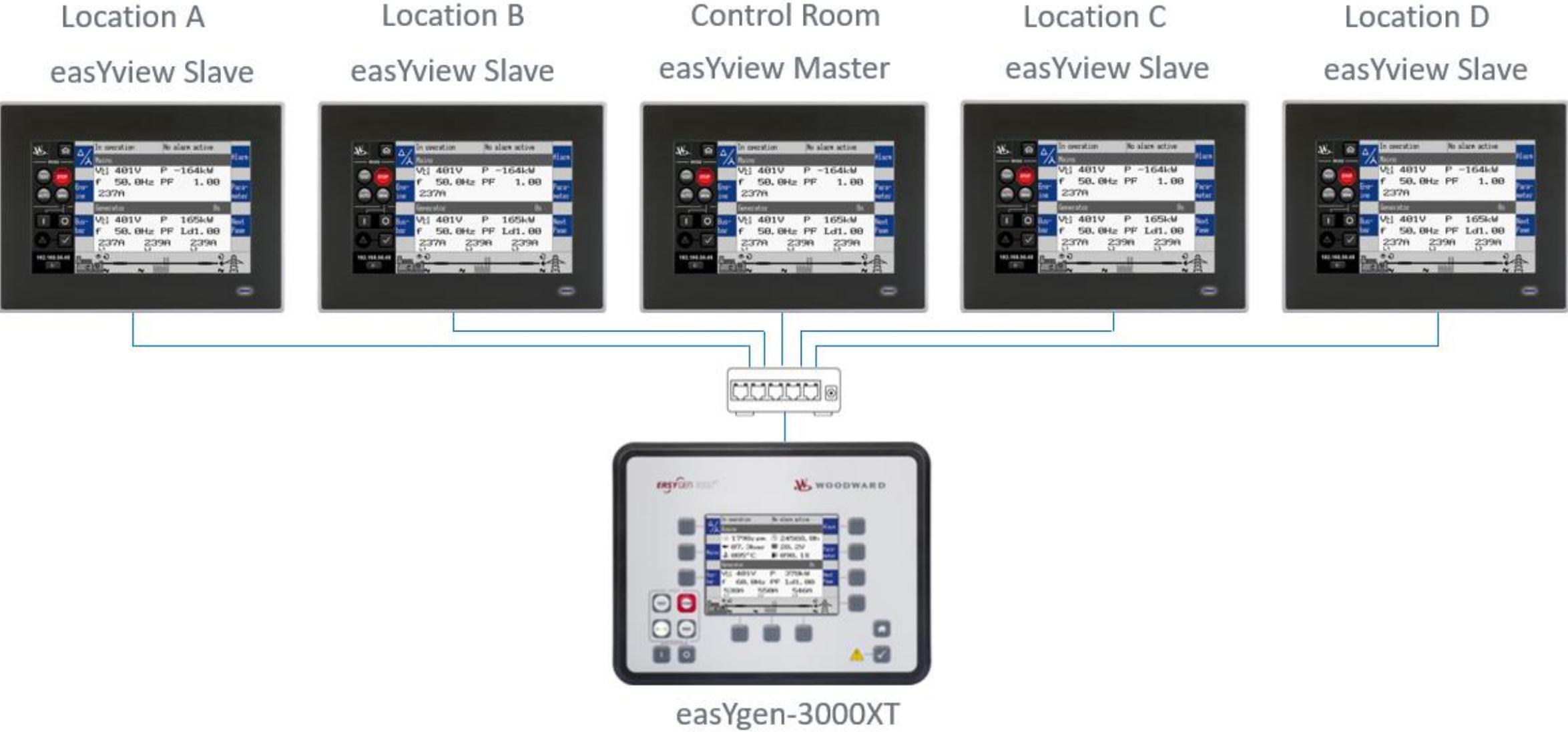scan to learn more
www.easYgen.org/easYview

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# easYview's Remote VNC HMI possibilities

Up to 5 easYview remote panels can share same HMI information

easYsim – Power Systems Simulation

> Cloudbased Simulation with 7 training models

> 3-month License P/N 10-059-783 easYsim

> Customized Simulation according your project needs based on an Industrial PC to be connected to your PLC

> easYgen-3000XT platform controls (easYgen-3000XT's, LS-6XT's, GC-3400XT-P1, DSLC-2XT and MSLC-2XT) digital twins can be added into power systems simulation
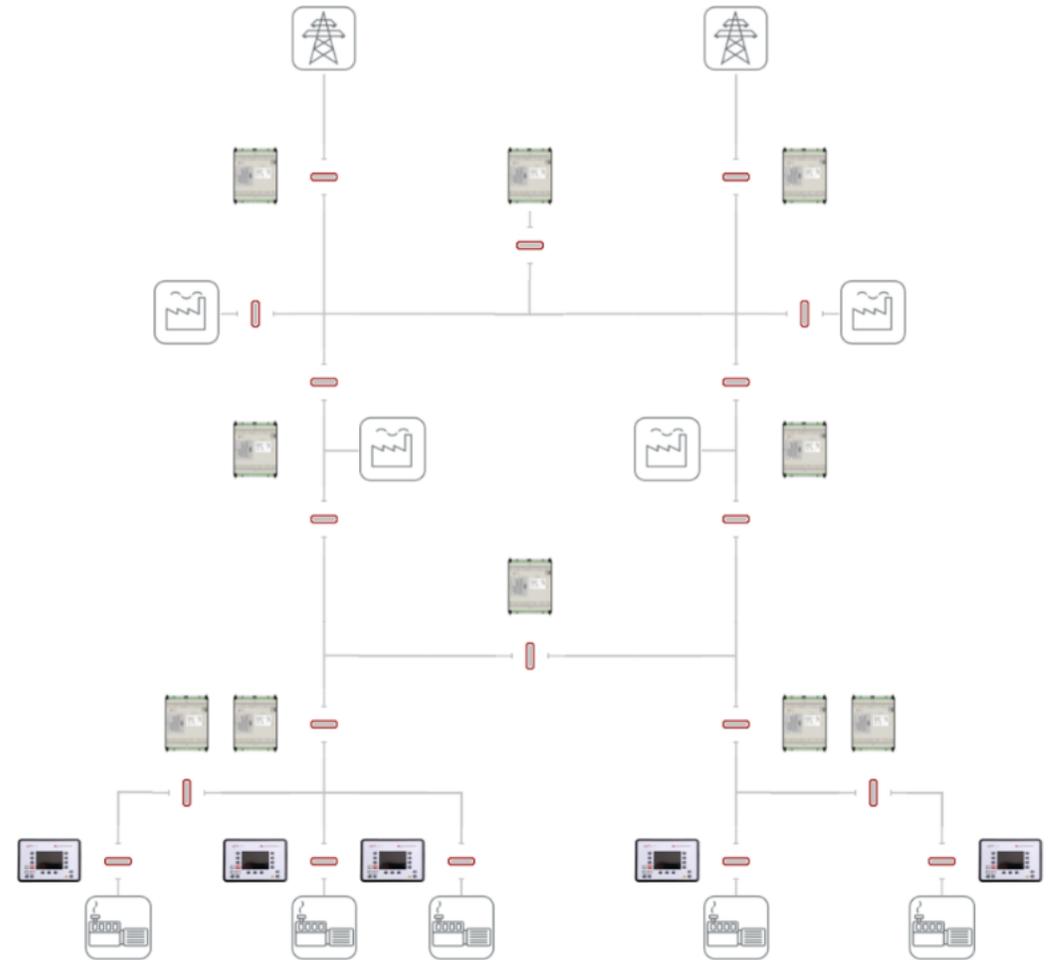
scan to learn more
www.easYgen.org/simulation
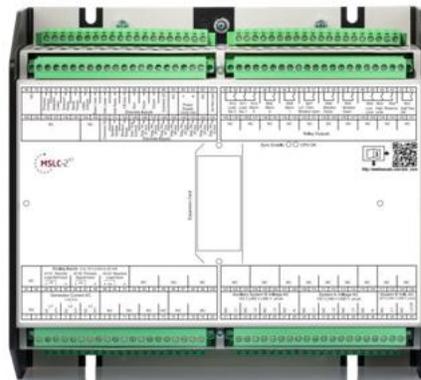
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Helpful Backup Slides

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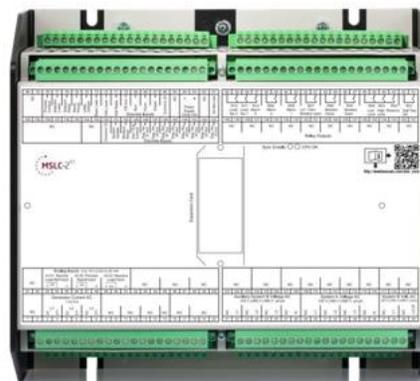WOODWARD

Why switch to new DSLC-2XT/MSLC-2XT?

> 8440-1878 DSLC-2-5 & 8440-1978 DSLC-2-1

> 8440-2299 DSLC-2XT

> 8440-1877 MSLC-2-5 & 8440-1977 MSLC-2-1

> 8440-2298 MSLC-2XT

> Same form factor

> Same mounting dimensions

> Only one P/N for DSLC-2/ MSLC-2XT

> Up to 690VAC direct sensing

> ../1A & ../5A current sensing

> Drop-in Replacement

> Class 1 kW sensing

> Higher galvanic isolation of PID outputs

> One additional ETH-C port

> Interoperable with old DSLC-2/MSLC2

> Manuals & configuration files stored on control

> USB configuration

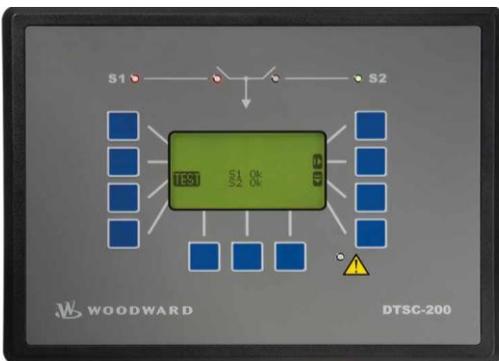**WOODWARD**

Why switch to new DTSC-200A ATS control?

› 8440-2297 DTSC-200A
8440-2323 DTSC-200A-P2 + Modbus TCP
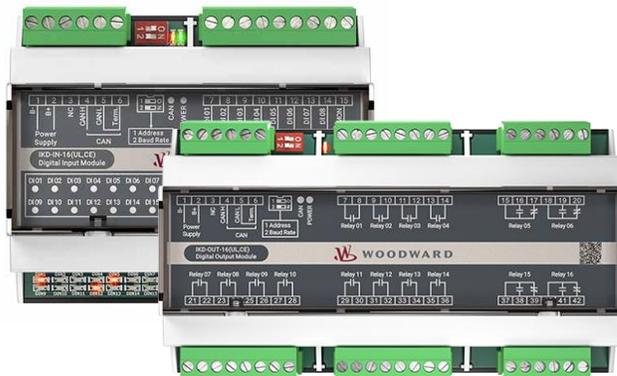
› 8440-2307 IKD-IN-16 &
8440-2306 IKD-OUT-16

› 8440-1868 DTSC-200-5
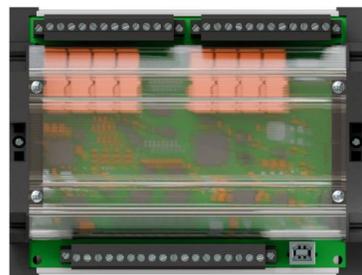
› 8440-2324 IKD2M

› 5417-1251 DPC-USB cable

only required for DTSC-200

› Same known Toolkit calibration tool

› Same DTSC-200 configuration& HMI

› Same CANopen& Modbus Protocols

› Re-use of DTSC-200 setting files in DTSC-200A

› Easier navigation by clear named push-buttons

› Larger, brighter graphical Display

› No battery inside to replace

› Add up to 2 IKD2M's or 1 IKD-IN-16 & OUT-16 I/O expansion cards

› Standard USB cable required

› Available from stock!

Why switching to easYgen-3500XT P2?

easYview (7", 10", 15")
easYview (7", 10", 15")

SubD terminal Adapter

PLC

690/110 VAC PT's

Bus Rotation Field relays

TEST

External Button

Start & Stop Buttons

CAN/E-Net Converters

easYgen-3500-5 P2

Galvanic Isolator for AVR

../1 or ../5A CT Version?

Class 1 Transducer

Enhanced Logic Manager

Reduce downtime - Have spare I/O's available for short term on site fixes

3-phase bus sensing

Redundant load sharing

Poleslip Monitoring

3 Ethernet Ports Modbus Master

Terminal Adapter Inbuilt for COM Ports

100-690VAC sensing

Illuminated Start & Stop Buttons inbuilt

$

Cost saving for entire control solution

Drop-In Replacement

easYgen-3500XT-P2

Class 1 for kW

Galvanic Isolation inbuilt up to 300V for AVR biasing

Integral AVR Regulation

WAGO and PHOENIX CAN based IO support

../1A & ../5A

Additional external 16AI + 4AO via CAN

WOODWARD

What to consider when upgrading old to new easYgen-3000/XT
DSLC-2/2XT MSLC-2/2XT

Check out our FAQ knowledgebase

› https://support.easygen.org/en/kb

› https://support.easygen.org/en-US/kb/articles/wiring-deltas-easygen-3100-3200-p1-p2-versus-easygen-3100xt-3200xt

› https://support.easygen.org/en-US/kb/articles/wiring-deltas-of-easygen-3400-3500-p1-p2-versus-easygen-3400xt-3500xt-p1-p2

› https://support.easygen.org/en-US/kb/articles/wiring-terminal-differences-dslc-2-dslc-2xt

› https://support.easygen.org/en-US/kb/articles/wiring-terminal-differences-mslc-2-mslc-2xt

scan for more information about legacy, obsolete power management
https://wss.woodward.com/manuals/Legacy/Forms/AllItems.aspx

Accessories for easYgen-3000XT

Engine-/Switchgear Room

Ethernet

> up to
>> 2x IKD-IN-16
>> 8440-2304

> easYgen-3000XT

> easYview

> up to
>> 2x easYlite-200
>> 8446-1007
>> Release 2.15

> up to
>> 2x IKD-OUT-16
>> 8440-2305

CAN-Open

WOODWARD

LSG Load Share Gateway

CAN Bus LS-Line

RS485 LS-Line

Analog LS-Line

> easYgen-3000XT

> easYgen-2000

> LSG
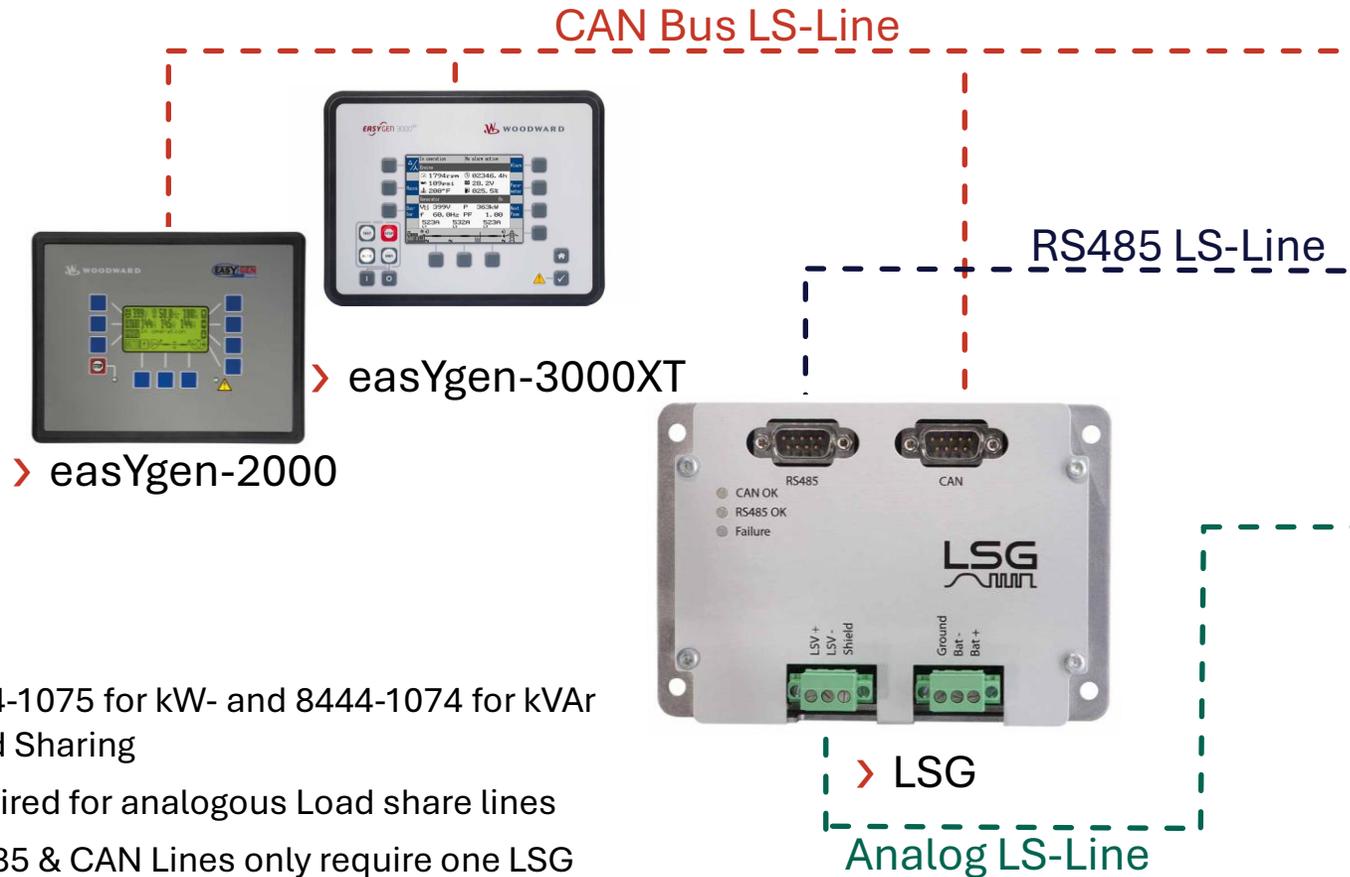
> GCP-3x   > MFR3x   > GCP-2x   > MFR2

> EGCP-1   > EGCP-2
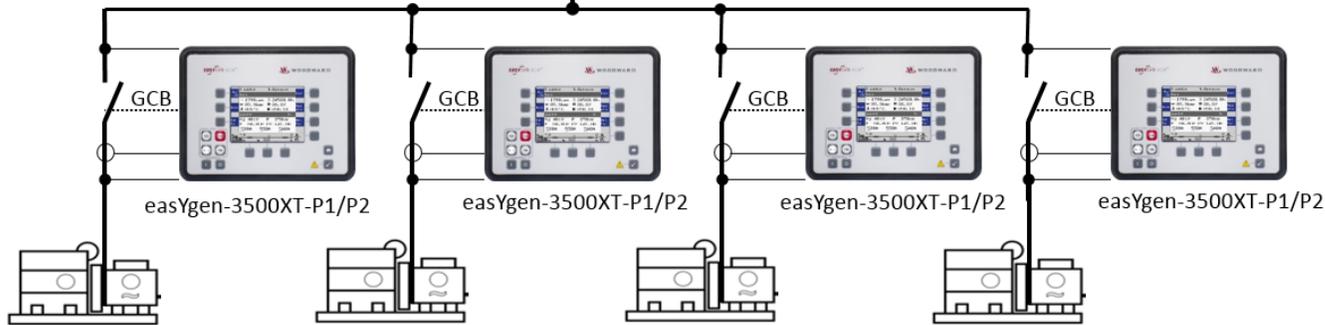
- 8444-1075 for kW- and 8444-1074 for kVAr Load Sharing
- required for analogous Load share lines
- RS485 & CAN Lines only require one LSG for kW & kVAr sharing

> MFR15/SPM-D11   > 0-4V
> LSM   > 0-3V
> 2301A   > 0-3V
> Pow-R-Con   > 0-5V
> PCC   > 0-2,5V
> 3rd Party Products   > 0-7V +/-5V

WOODWARD

Run-up Synch Fast Paralleling

MCB

Load

GGB
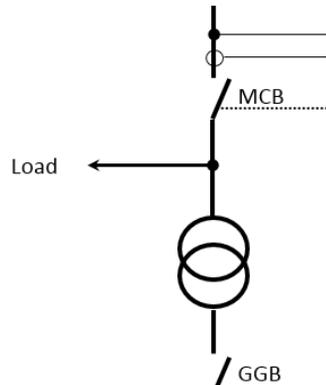
click to see the video
or scan QR code

GCB   easYgen-3500XT-P1/P2   GCB   easYgen-3500XT-P1/P2   GCB   easYgen-3500XT-P1/P2   GCB   easYgen-3500XT-P1/P2

4 x 1000 kVA Caterpillar Diesel generator sets paralleled within 7 seconds

> Run-Up Synch can be done in various App Modes depending on the application, only easYgen-3400/3500XT is required

Customer problem

Want to parallel n+1 backup gensets together in shortest possible time within only some seconds, to shrink Battery UPS backup system, to be able to provide suddenly power for heavy load one genset alone cannot provide or be able to provide total genset load beyond 10 or15 seconds which is a requirement in many critical applications like Datacenters, Hospitals, Airport, Chemical & Process Industry.

Solution – Run-Up Synch

All the generators are paralleled together by closing their circuit breakers during the engine start sequence. Then after a certain speed is achieved the voltage regulators are enabled and the generators will produce voltage. The run-up synchronization method is used to get several synchronous generators onto load in a very short time. This time is determined by the engine start time and the AVR on-excitation.

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easYgen FAQ knowledgebase

scan to learn more
https://support.easygen.org/en/kb

Documentation Server

Power Generation Controls

All Documents   test   [Find a file   🔍]

✓	📄	Name		Modified	PGC Update Title and Modifier WF
	📁	Compliance_Certificates	...	March 15, 2021	
	📁	DSLC_MSLC_series	...	December 7, 2021	Completed
	📁	DTSC_series	...	March 15, 2021	
	📁	easYgen-100_series	...	March 15, 2021	
	📁	easYgen-1000_series	...	March 15, 2021	
	📁	easYgen-2000_series	...	March 15, 2021	
	📁	easYgen-3000XT_series	...	March 15, 2021	
	📁	easYlite-200	...	March 15, 2021	
	📁	easYprotec_series	...	June 23, 2021	
	📁	Legacy_Controllers	...	March 15, 2021	
	📁	LS-5_series	...	October 19, 2021	
	📁	MFR-x00_series	...	June 23, 2021	
	📁	SW_Tools	...	March 15, 2021	

scan to learn more
https://wss.woodward.com/
manuals/PGC/Forms/AllIte
ms.aspx

Legacy controls replacement data base

Please search for your item number or the item description:

search [egcp]

ITEM NUMBER	ITEM DESCRIPTION	ITEM NUMBER	ITEM DESCRIPTION	COMMENTS	PRODUCT DOCUMENTATION	EXTERNAL LINK
8406-020	EGCP-1, 24VDC, 90-277 VAC PT'S	8440-2082	easYgen-3200XT	Loadshare Gateway LSG required if n+1 gens	»	»
8406-021	EGCP-1, 24VDC, 90-277 VAC PT'S	8440-2082	easYgen-3200XT	Loadshare Gateway LSG required if n+1 gens	»	»
8406-113	EGCP-3 'I LS"	8440-2088	easYgen-3500XT-P2	LON not supported in easYgen!	»	
8406-114	EGCP-3 "MC"	8440-2222	LS-6XT	LON not supported in LS-6XT	»	

scan to learn more
https://easygen.org/legacy-product-replacement/

Toolkit and Software Tools

Check out our FAQ knowledgebase

- › ToolKit
- › ToolKit manual
- › Configuration files download
- › HMI Localization Tool
- › LDSS Emulation Tool
- › ModbusMasterMapper
- › TelegramMapper

Power Management Controls Channel

scan to learn more

Thank you!

Powering a clean future

WOODWARD