

... and other samples

easYgen-1000/2000/3000, LS-5, and DTSC-200

‘Using proconX ESENET with Woodward controllers ‘

Optional Supplementary Information

General Information

The following alert boxes can be used in this publication:



“DANGER” indicates a hazardous situation which, if not avoided, will result in death or serious injury.



“WARNING” indicates a hazardous situation which, if not avoided, could result in death or serious injury.



“CAUTION”, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

“NOTICE” is used to address practices not related to personal injury.

IMPORTANT

“IMPORTANT” is used to address practices not related to personal injury.

Personnel



WARNING!
Hazards due to insufficiently qualified personnel!

If unqualified personnel perform work on or with the control unit hazards may arise which can cause serious injury and substantial damage to property.

- Therefore, all work must only be carried out by appropriately qualified personnel.

For further Product Support Options, Product Service Options, Returning Equipment for Repair, and/or Engineering Services please [download application note #37573](#).

Requirements

This application note describes several use cases so the required hardware depends on your application. Described are samples with several easYgen-3000 devices, ESENET gateway(s) and additional converters, several displays, and a laptop.

Documentation



Read this entire application note and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage!

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment.

Any such unauthorized modifications: constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and invalidate product certifications or listings.



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Introduction

The gateway proconX ESENET allows SCADA systems, PLC's and visualization panels to communicate over Ethernet with one or more Woodward controllers. This application note describes several use cases.

About proconX ESENET

The ESENET (Woodward P/N #8445-1044), designed and manufactured by proconX Pty. Ltd. is an Ethernet gateway specifically designed to interface Woodward's genset controllers and ATS controllers with Modbus/TCP networks. The gateway features a CAN and an Ethernet port and can be mounted on a DIN rail. On the CAN side it implements the CANopen protocol to connect to the Woodward controls. On Ethernet it implements a Modbus server (Modbus/TCP) and accepts connections from Modbus master devices like PLCs or SCADA systems. Please see product documentation from proconX (manual - UMESENET-1101, Set-up application note – AN309-1102, datasheet – DSESENET-1102) for more details.

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Using proconX ESENET with Woodward controllers

Benefits using proconX ESENET with Woodward controllers

The ESENET can be used with easYgen3000, easYgen2000, easYgen1000, DTSC-200 and LS-5. One ESENET can communicate with up to 16 WW units connected on CAN bus. The ESENET does not only translate Modbus TCP transactions into CANopen orders but also collects data of the WW devices in its own memory. This provides a fast refresh of visualization data in comparison to a serial Modbus connection. ESENET can be used in several applications.

- easYgens can be visualized, configured and controlled from a remote display panel or PLC
- easYgens along with LS-5s can be visualized, configured and controlled from a display panel or PLC
- A PLC or SCADA system shall visualize data of easYgens and LS-5s. The easYgens shall accept commands and set points. The PLC or SCADA system shall be able to reconfigure parameters.

Additionally, ESENET supports the connection of the Woodward own PC tool “ToolKit” to Woodward devices over Ethernet. This feature allows to

- Connect multiple easYgens of the same type with ToolKit
- Connect multiple LS-5s of the same type with ToolKit
- Establish remote control over Ethernet instruments controlled by ToolKit
 - Alarm status display
 - Counter status display
 - Reconfiguration of functions
 - Remote control Start/Stop/Acknowledge.

NOTICE

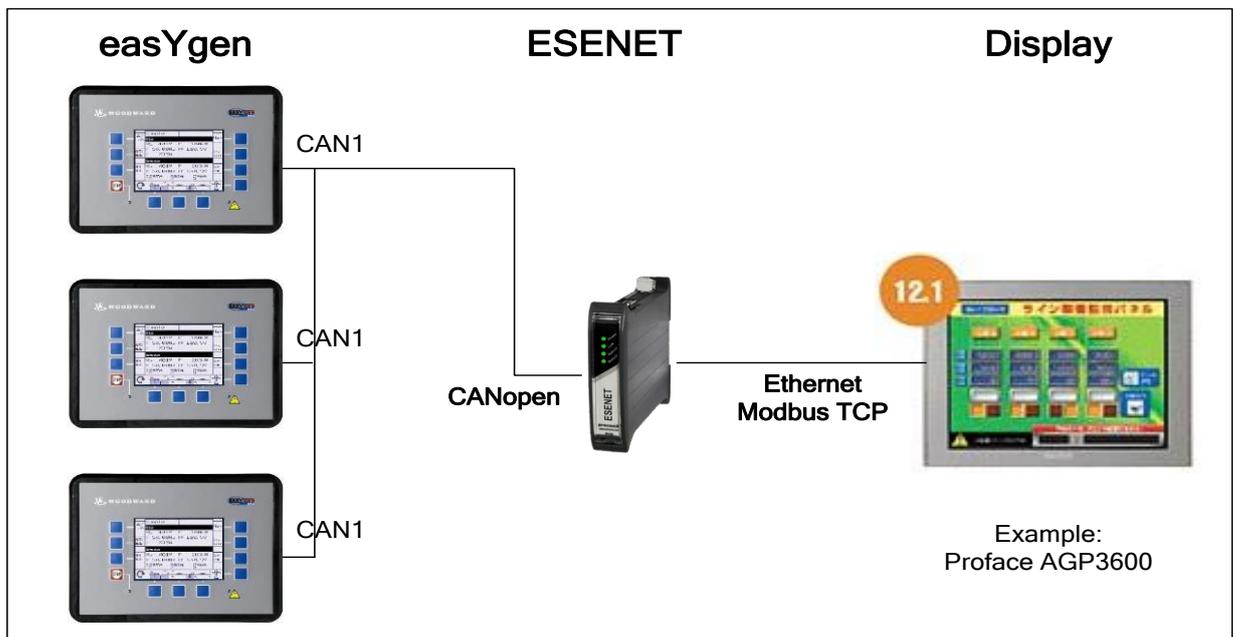
Woodward devices that can be configured via LeoPC1 software only, CANNOT be configured via ToolKit/ESENET directly!

ESENET can be used for communication but LeoPC1 configuration needs a PLC, in between.

Application Examples

Visualization and/or control of easYgen from a display panel or PLC

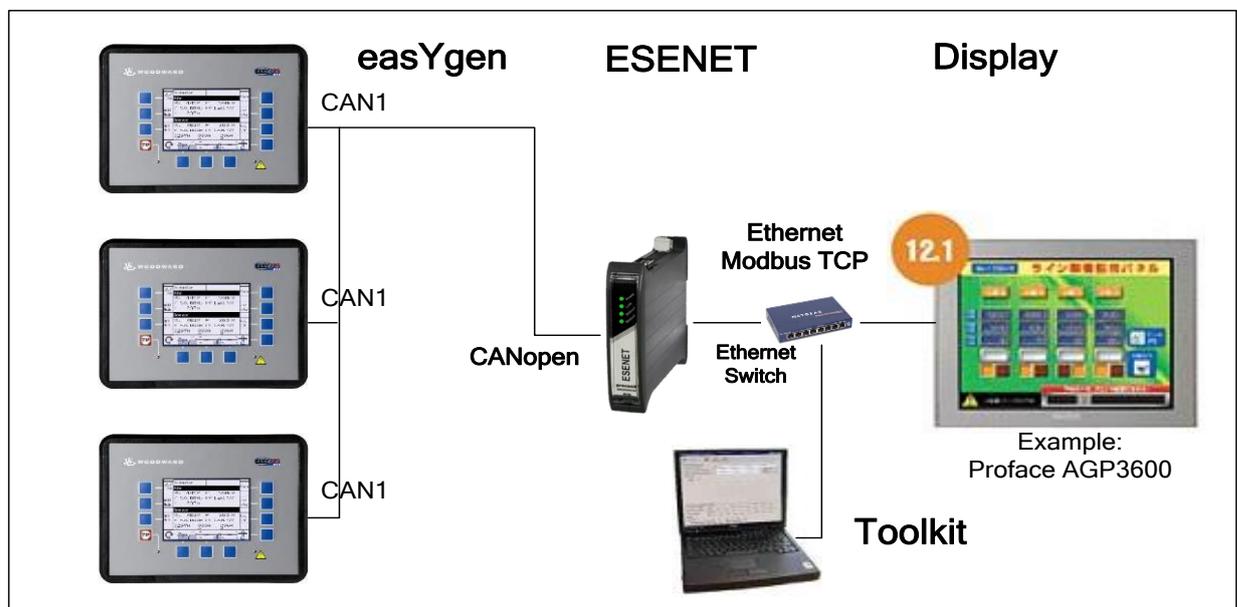
The ESENET receives Modbus TCP orders by the display panel for reading out easYgen data. The display panel must be able to run Modbus TCP as master. Up to 16 easYgens can be connected in a network. The programmer of the display panel uses the Modbus addresses like it is described in the easYgen manual. In comparison to a direct serial coupled display application, the refresh rate of the single values is faster via ESENET.



System of easYgen3200 with freely configurable Display Panel

The display programming is done by the customer. As long as the display software allows it, the display can visualize all relevant data of the easYgen(s). The concept includes also the capability sending remote control orders from the display panel to the single easYgen.

Woodward provides demo templates for Proface Display AGP3600.

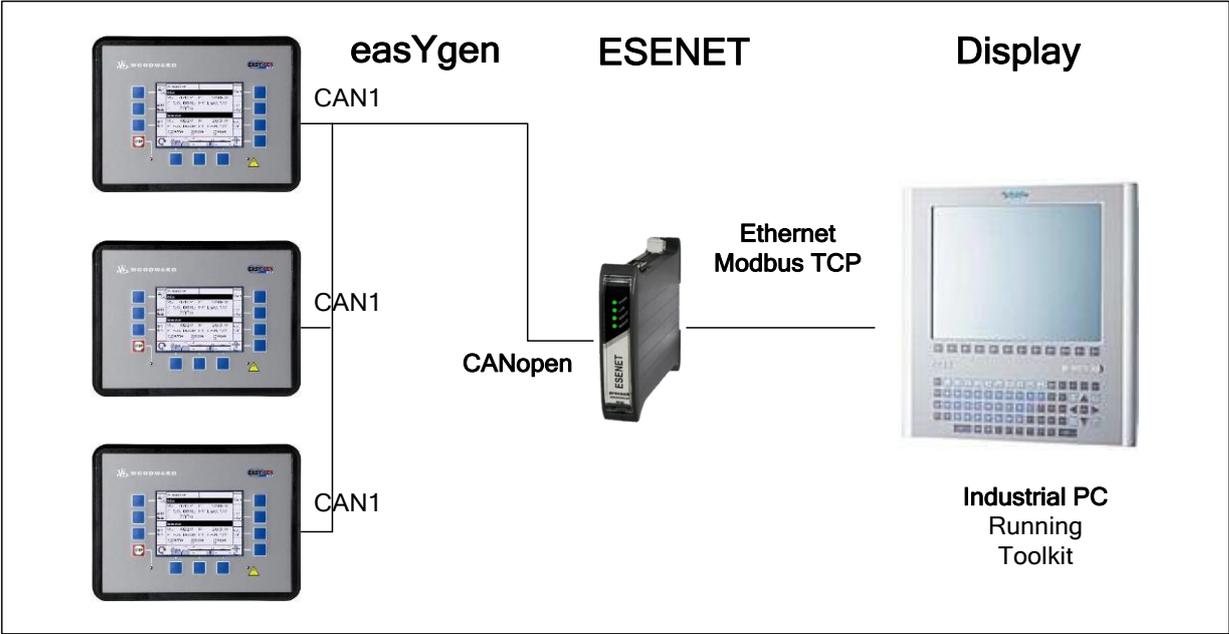


System of easYgen3200 with Display Panel and PC service tool ToolKit

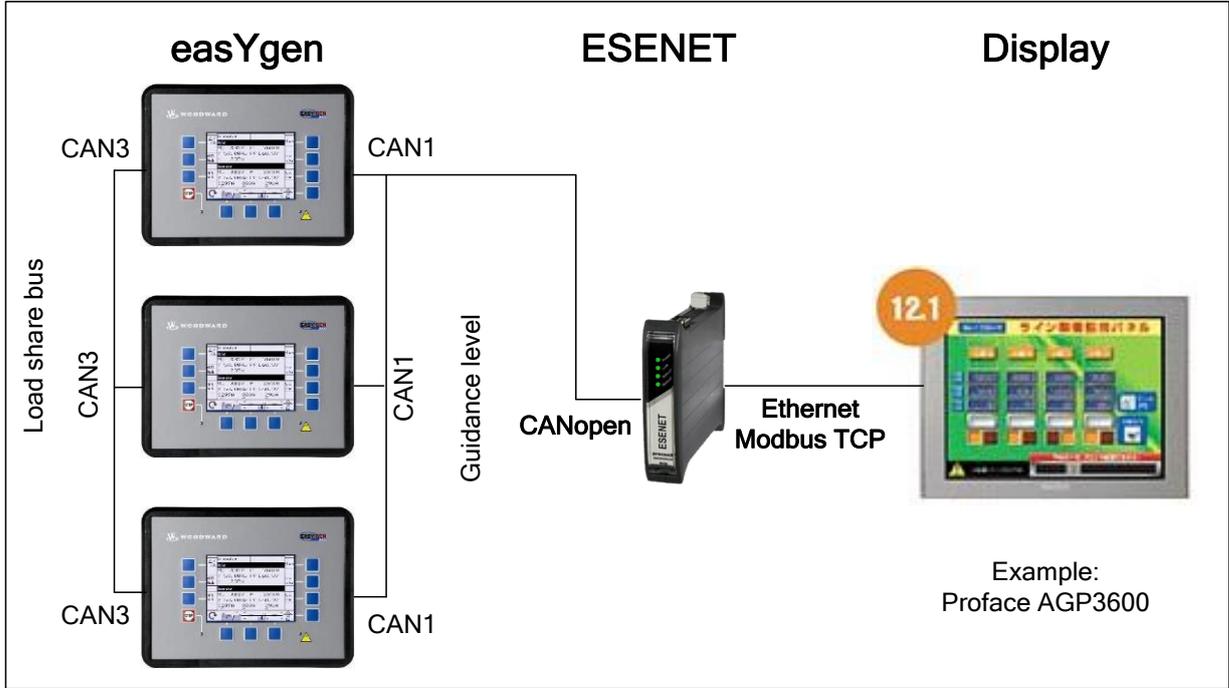
The PC software ToolKit can be equipped with a driver to handle the ESENET gateway. It means that the ToolKit orders are translated to the Modbus TCP orders, which finally result in CANopen commands. This procedure permits to run a display panel simultaneously to ToolKit.

NOTICE

proconX offers a driver for ToolKit talking to ESENET via Ethernet. The dll of the existing USB Kvaser driver is used. After installing the driver, the operator can connect the ESENET through the USB Kvaser call. Woodward plans to bring the ESENET driver as well into the connection dialog.



System of easYgen3200 with industrial PC running ToolKit



With easYgen-3500

The easYgen-3500 provides an especially CAN3 port for load share and L5 purposes. The CAN1 bus remains the CAN connection for the ESENET.

1. Display Panel or PLC visualizes and/or controls a system of easYgen-3500 / LS-5

The easYgen-3500 (up to 32) exchange their data with LS-5 (up to 16) over the CAN3 bus. The CAN3 bus is used to allow fast communication between the units in the easYgen-3500 / LS-5 system. Other functionalities, like communication to PLC or SCADA systems or Display Panels are executed over the CAN1 bus. CAN2 bus is dedicated to remote panels, the engine control module (J1939) and extended I/O (CANopen). The LS-5 is equipped with one CAN bus. So this bus provides:

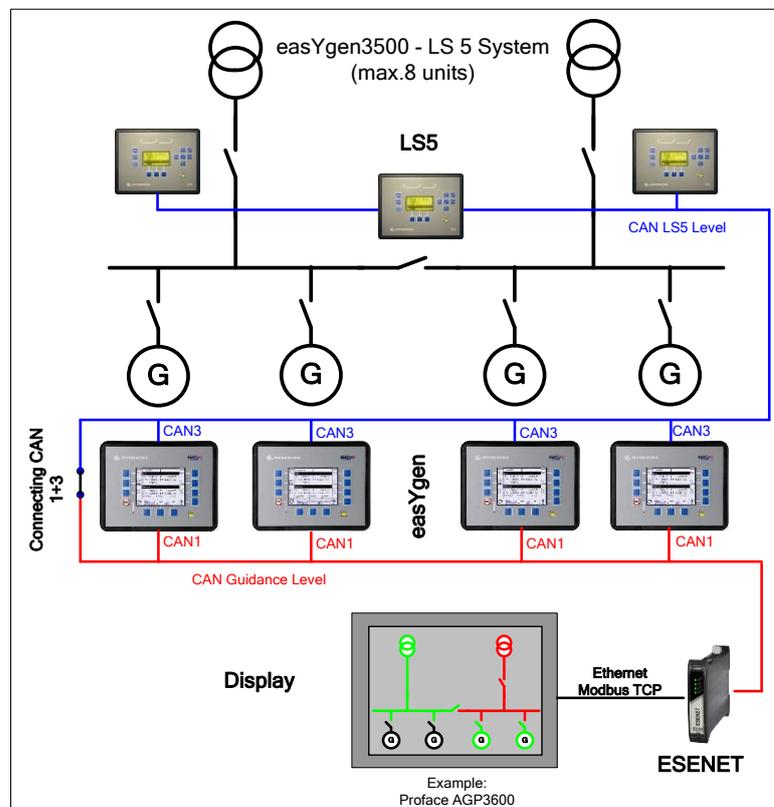
- Exchange data with neighboring LS-5's and easYgen-3500's
- Provide PLC / SCADA systems with visualization data
- Provide PLC/ SCADA systems with configuration capability
- Provide PLC/ SCADA systems with remote control functionalities
- Toolkit communication via CAN interface.

The following chapters show how the ESENET can access on the easYgen / LS 5 system under various configurations.

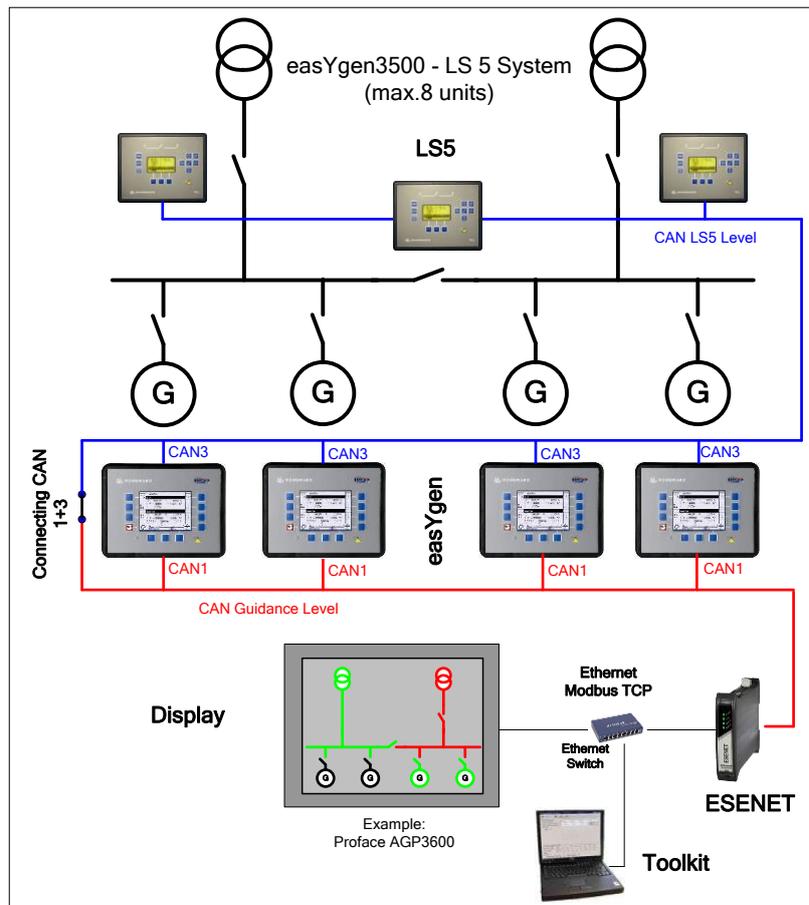
1.1. Display Panel or PLC visualizes and/or controls a system of easYgen-3500 / LS-5

If the number of members on the easYgen-3500 / LS-5 system is restricted to max eight, it is possible to interlink the CAN1 and the CAN3 bus at one location. This topology allows using one ESENET to access all members in the whole system. To keep the data traffic small, the Remote Panel RP3000 shall not be connected additionally on the CAN1 bus. The ESENET gateway allows to:

- Visualize measuring data and conditions of easYgen and LS-5
- Control easYgen and LS-5 (for example: Start/Stop engine, Open/Close breaker, Alarms ...)
- Unit configuration



An easYgen-3500 / LS-5 system (max. 8 members on CAN bus)



An easYgen-3500 / LS-5 system and PC service tool Toolkit (max. 8 members on CAN bus)

NOTICE

Running the Service tool Toolkit on the CANbus with different CANopen members requires especially adjustments in the *.wtool-file. In the example above Toolkit could be started with the wtool-file for LS-5 or easYgen-3500. During the first connection to the CANbus Toolkit will ask for a *.sid-file, which is unknown. With allocating one-time the correct *.sid-files for all members Toolkit will be right adjusted.

NOTICE

Handling different Woodward units simultaneously can be accomplished by Toolkit, but the user has to design overview screens. This requires the design license version of Toolkit. Woodward will offer some design templates in future to ease adaptation to single applications.

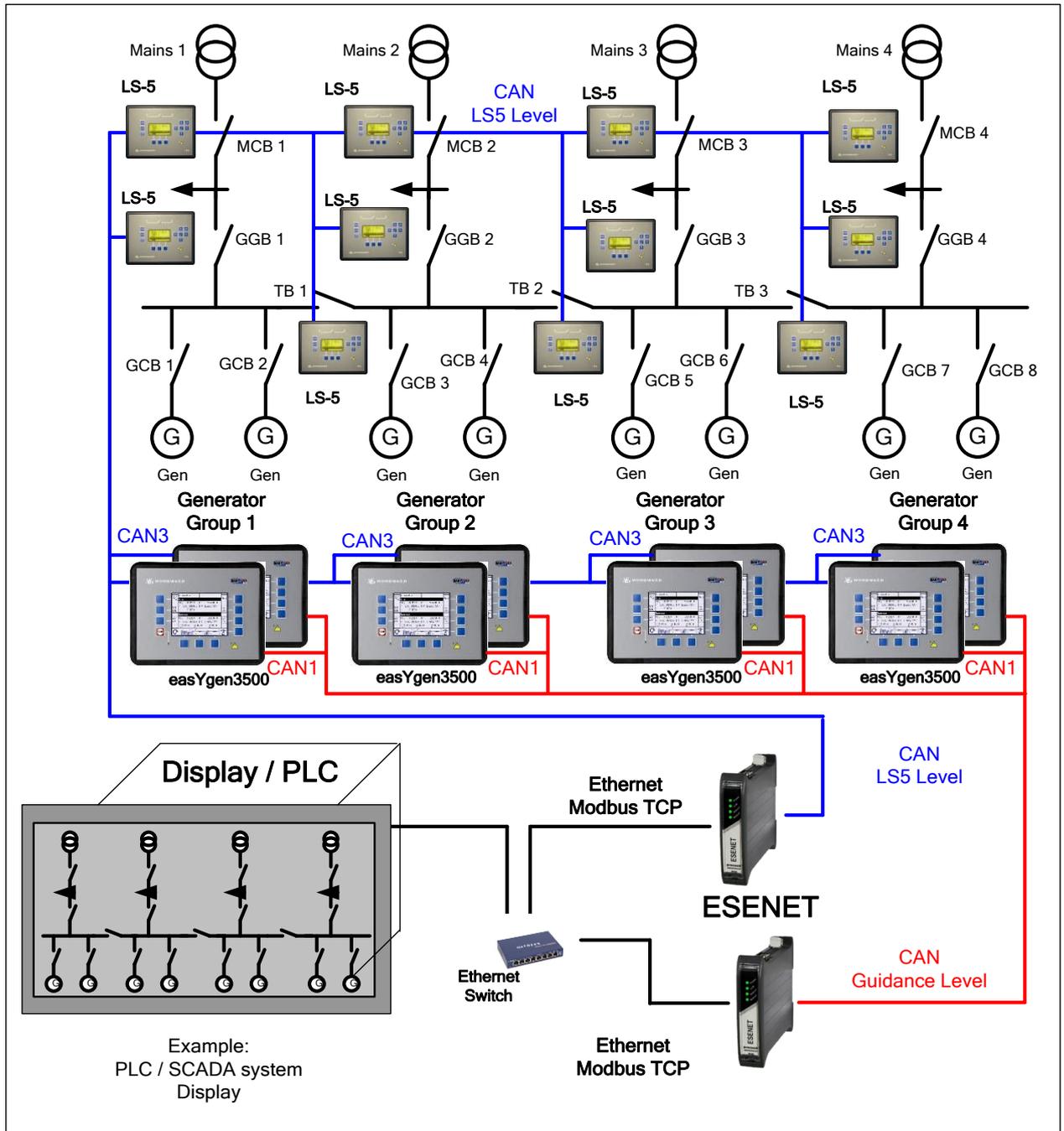
1.2. Display Panel or PLC shall visualize and/or control a system of easYgens and LS-5 (More than 8 members on CAN)

Usually the CAN3 bus must operate separated from the CAN1 bus. If the number of members on the easYgen-3500 / LS-5 system exceeds eight, two EUNET units are required to visualize and/or control the system. This requires a Display Panel with two Ethernet Ports or the use of an Ethernet switch. EUNET gateway on CAN1 allows to:

- Visualize easYgen data and conditions
- Control easYgen (e.g.: Start/Stop engine, Open/Close breaker, Acknowledgement of alarms...)
- Configuration of the easYgen units

ESENET gateway on CAN3 allows to:

- Visualize LS-5 data and conditions ¹
- Control LS-5 (for example: Open/Close breaker, Acknowledgement of alarms...)
- Configuration of the LS-5 units



A complex easYgen-3500 / LS-5 system (More than 8 members on CAN3 bus)

¹ Notice: The ESENET causes additional data traffic on CAN3. For member number greater 8 a higher baud rate could be required, which has also an impact on the CAN distances.

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