



-power in control



APPLICATION NOTES



IOM 200 analogue interface for AGC 200

- CAN bus interface
- Governor analogue interface
- AVR analogue interface
- Analogue load sharing line



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1. General Information

1.1 Warnings, legal information and safety

1.1.1 Notes and warnings

Throughout this document, a number of notes and warnings will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Notes



The notes provide general information which will be helpful for the reader to bear in mind.

Warnings



The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

1.1.2 Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.



Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

1.1.3 Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

1.1.4 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator set controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.



The units are not to be opened by unauthorised personnel. If opened in any way, the warranty will be lost.

1.1.5 Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

1.2 About the Application Notes

1.2.1 General purpose

This document includes application notes for DEIF's AGC 200 series of Advanced Genset Controllers. It mainly includes examples of different applications suitable for the units.



For functional descriptions, the procedure for parameter setup, complete standard parameter lists, and so on, please refer to the Designer's Reference Handbook.

The general purpose of the Application Notes is to offer the designer information about how to combine the AGC 200 with the IOM 200 series of interface modules.



Please make sure to read this handbook before working with the Multi-line 2 controller and the genset to be controlled. Failure to do this could result in damage to the equipment or human injury.

1.2.2 Intended users

The Application Notes is mainly intended for the person responsible for designing AGC 200 systems. In most cases, this would be a panel builder designer. Naturally, other users might also find useful information in this document.

1.2.3 Contents and overall structure

The Application Notes is divided into chapters, and in order to make the structure of the document simple and easy to use, each chapter will begin from the top of a new page.

2. Applications and overview

2.1 Application overview

2.1.1 Overview

The IOM 200 series is an interface module between the AGC 200 series controller and analogue governors/AVRs and/or analogue load sharing lines.

The IOM 200 connects to the AGC 200 using the AGC 200 CAN bus line C.

The setting for CAN C must be H5 EIC, when interfacing with an IOM module.

AGC 200 CAN bus line functions available:

	CAN A	CAN B	CAN C
AGC 212, 213	Not available	Not available	OFF External I/O H5 EIC AOP2
AGC 222	Not available	OFF External I/O PM Secondary CANshare AOP2 PM Primary	OFF External I/O H5 EIC CANshare AOP2
AGC 232, 233	OFF External I/O CANshare AOP2	OFF External I/O CANshare AOP2	OFF External I/O H5 EIC CANshare AOP2
AGC 242, 243	OFF External I/O PM Primary CANshare AOP2 PM Secondary	OFF External I/O PM Secondary CANshare AOP2 PM Primary	OFF External I/O H5 EIC CANshare AOP2
AGC 245, 246	OFF External I/O PM Primary AOP2 PM Secondary	OFF External I/O PM Secondary AOP2 PM Primary	OFF External I/O H5 EIC AOP2



The AGC 220 series holds CAN B + C (power management or CANshare).

The AGC 230 series holds CAN A + B + C (CANshare only).

The AGC 240 series holds CAN A + B + C (power management or CANshare).

IOM 200 variants:

IOM 220: Analogue interface to speed governor and AVR.

IOM 230: Analogue interface to speed governor and AVR + analogue load sharing and var sharing lines.

i Please refer to the IOM 200 data sheet, document no. 4921240366, for further information about the IOM 200 modules.

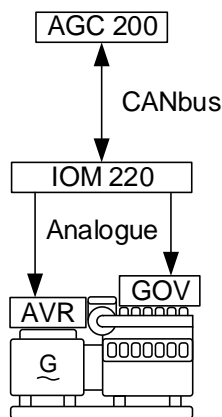
i Please refer to the "Interfacing DEIF equipment to governors and AVRs", document no. 4189340670, for information about how to connect to specific governors/engine controllers/AVRs.

2.2 Applications

2.2.1 Speed governor/AVR, single generator using IOM 220

(1) Speed governor with or without voltage control

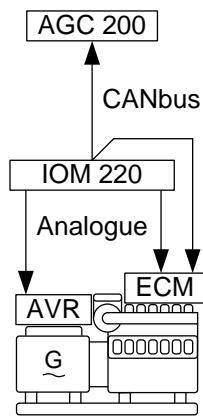
Using CAN C engine I/F J1939



i Available for all AGC 200 variants.

Setting	Selection
CAN bus C (7843)	H5 EIC
Engine I/F (7561)	Any
EIC controls (7563)	ON
Reg. output GOV (2781)	EIC
Reg. output AVR (2782)	EIC

(2) Engine communication, speed governor, voltage control




i Available for all AGC 200 variants.


Setting	Selection
CAN bus C (7843)	H5 EIC
Engine I/F (7561)	Any
EIC controls (7563)	ON or OFF
Reg. output GOV (2781)	EIC
Reg. output AVR (2782)	EIC

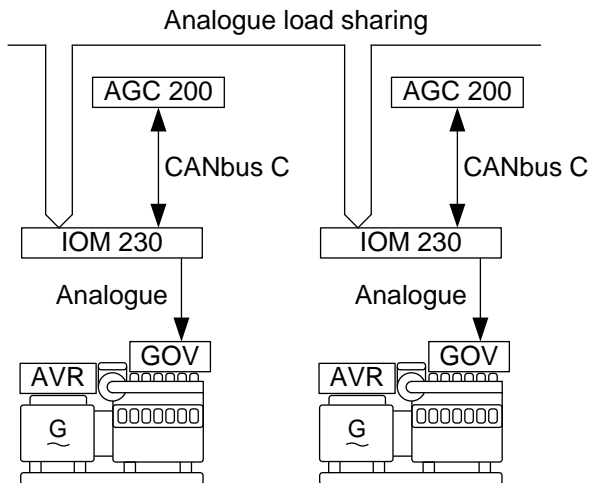
i This configuration can be used for engines with or without CAN bus commands.
With: The speed is set directly to the engine ECM via CAN bus.
Without: The speed is set via the IOM 220 module to ECM.

2.2.2 Speed governor/AVR and analogue load sharing using IOM 230

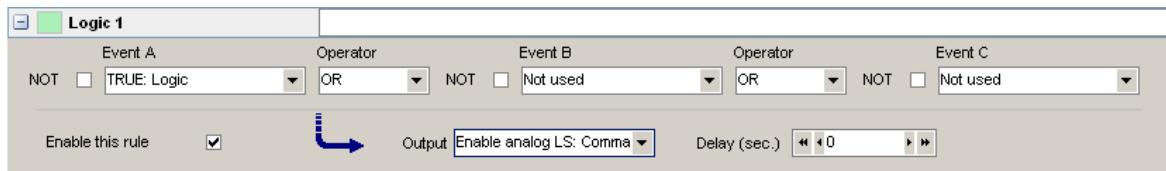
(3) Speed governor/AVR and analogue load sharing example

 Using the IOM 230 module, analogue load sharing can be combined with application (1) or (2) shown under the paragraph "Speed governor/AVR, single generator".

 The CAN bus C must be set to EIC.

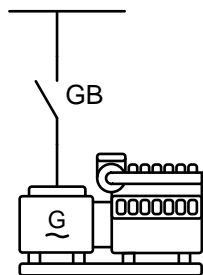


The analogue load sharing line must be switched ON. This is done in M-Logic via Command:



2.2.3 Speed governor/AVR and digital load sharing with IOM 220

The selection of application configuration for CANshare must be single DG:



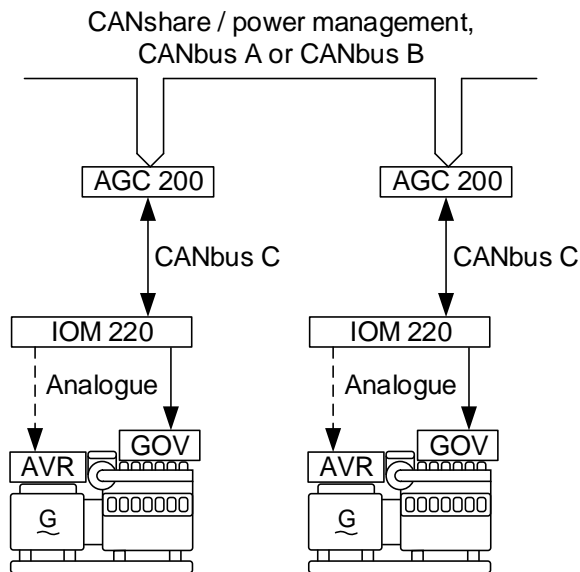
For power management, the application configuration is plant dependant.

i Unless otherwise stated, the examples below are valid for both CANshare and power management applications.

(4) Speed governor with or without voltage control.

i Available for all AGC 230 and 240 variants.

i Power management is only available for AGC 240 variants.



Setting	Selection
CAN bus A (7841)	Any, but not equal to CAN B
CAN bus B (7842)	Any, but not equal to CAN A
CAN bus C (7843)	H5 EIC
Engine I/F (7561)	Any
EIC controls (7563)	ON or OFF
Reg. output GOV (2781)	EIC
Reg. output AVR (2782)	EIC

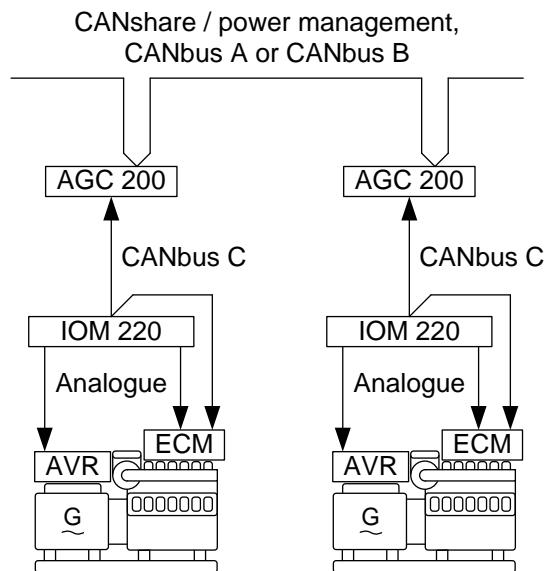
(5) Engine communication, speed governor, voltage control



Available for all AGC 230 and 240 variants.



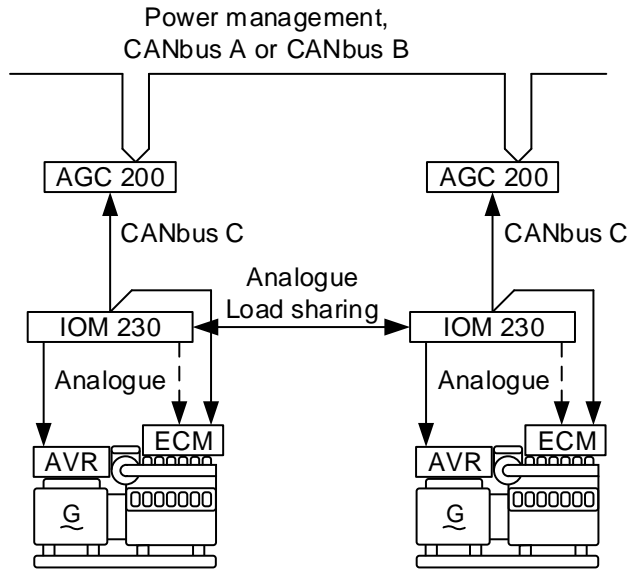
Power management is only available for AGC 240 variants.



Setting	Selection
CAN bus A (7841)	Any, but not equal to CAN B
CAN bus B (7842)	Any, but not equal to CAN A
CAN bus C (7843)	H5 EIC
Engine I/F (7561)	Any
EIC controls (7563)	ON or OFF
Reg. output GOV (2781)	EIC
Reg. output AVR (2782)	EIC

2.2.4 Power management with analogue load sharing line backup

In case the power management CAN bus line fails, the load sharing is lost. If needed, the IOM 230 analogue load sharing line can be used.



In this application, at least two CAN bus lines (A or B and C) must be used.

Engine communication (CAN C) is used for the Engine Control Module (ECM) and for the IOM 230.

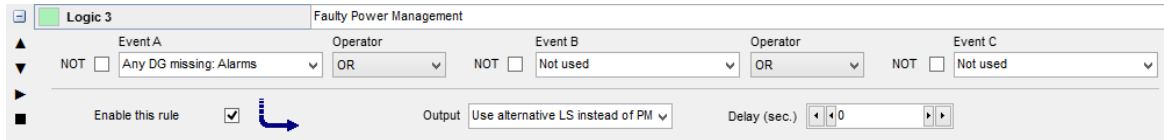
i Only applicable in the AGC 240 series.

Power management on:	CAN A	CAN B
Setting	Selection	Selection
CAN bus A (7841)	PM primary/secondary	CANshare
CAN bus B (7842)	CANshare	PM primary/secondary
CAN bus C (7843)	H5 EIC	H5 EIC
Engine I/F (7561)	Any	Any
EIC controls (7563)	ON	ON
Reg. output GOV (2781)	EIC	EIC
Reg. output AVR (2782)	EIC	EIC

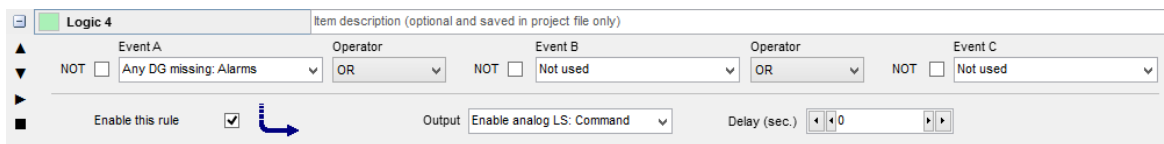
In case of a faulty PM, no automatic switching to load sharing takes place. M-Logic is used to activate and determine the type of load sharing which is used in case of a faulty power management line. Two kinds of load sharing are available (if correct hardware and wiring are present): "CANshare" (digital load sharing) or "Analogue load sharing" (IOM 230).

Any event can be used to activate the switching from power management to load sharing. In this case, the alarm "Any DG missing" is used because it is stating a problem with power management.

The M-Logic command "Use alternative LS instead of PM" disables the power management and thereby enables the use of CANshare (if wiring and configuration are done correctly).



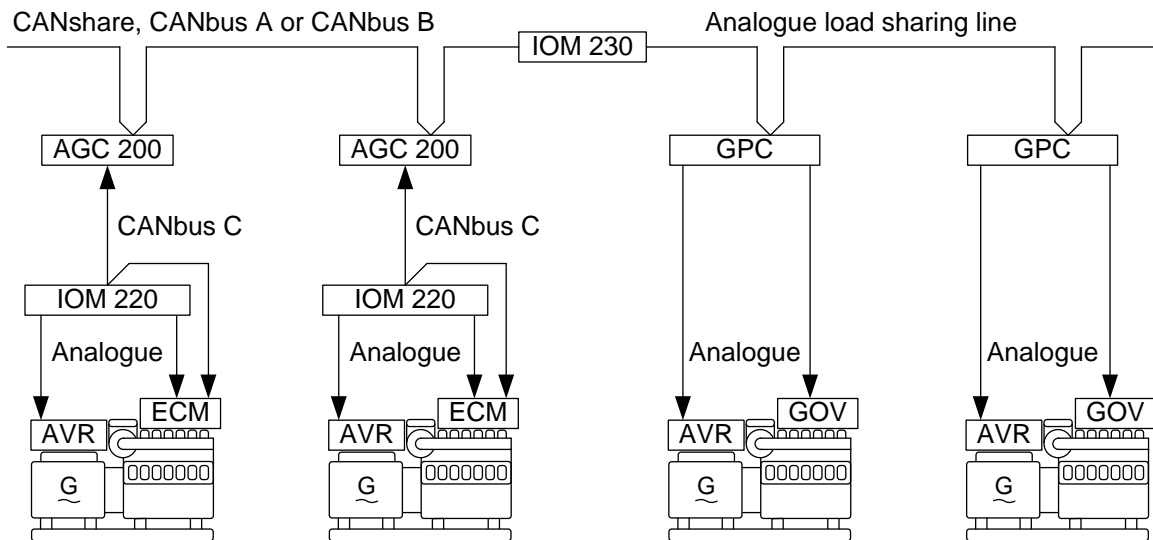
In addition to this, the M-Logic command "Enable analog LS" enables analogue load sharing. This command is used in cases where analogue LS is preferred instead of CANshare, because analogue LS overrules CANshare.



The use of analogue LS requires IOM 230 as well as correct wiring and configuration of this.

2.2.5 CANshare mixing with analogue load sharing

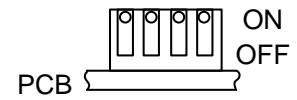
In case the AGC 200 units are to be used for generator sets that are added to an existing plant with analogue load sharing lines, the IOM 230 can be used as an interface between the two systems. The example below is with DEIF GPC units, but all DEIF Multi-line units with analogue load sharing can be used.






i CAN bus C must be set to EIC. It is not possible to set two CAN bus connections to CANshare.

2.2.6 DIP switches, output selections for governor/AVR

Output	SW 1	SW 2	SW 3	SW 4
+/-25 mA	ON	OFF	NOT USED	OFF
0 to 20 mA	OFF	ON		OFF
+/-12 V DC	ON	OFF		ON
0 to 10 V DC	OFF	ON		ON



-  The V DC signal levels can be adjusted via the potentiometers.
-  SW 1 and SW 2 cannot have the same position.
-  Output resolution is 1024 steps regardless of selected range.