WOODWARD

Option SB
Engine RS-232 Interface

Functional Description

WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety procedures and precautions. Failure to follow safety procedures and precautions may result in personal injury and/or property damage.

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overtemperature, or overpressure, where applicable) shutdown device(s) that operates independently of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover resulting in possible personal injury or loss of life should the mechanical-hydraulic governor(s) or electric control(s), the actuator(s), fuel control(s), the driving mechanism(s), the linkage(s), or the control device(s) fail.

CAUTION

To prevent damage to control systems that uses an alternator or battery-charging device, ensure the charging device is turned off before disconnecting the battery source from the system.

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch components or conductors of a printed circuit board with bare hands or conductive devices.**

Important Definitions

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment.

NOTE

Provides other helpful information that does not fall under the warning or caution categories.

Revision History

Rev.	Date	Editor	Changes
NEW	03-02-20	Tr	Release
A	04-06-15	TP	Minor corrections
B	05-08-18	TP	Minor corrections
C	06-01-11	TP	Minor corrections

Contents

Chapter 1.
Introduction

CAUTION

This brief manual can only be used together with the complete manual.

This manual describes the following options:

- **Option SB03** (description starting on page 5)
  - **Caterpillar CCM** coupling to
    ECM (details on page 11) and
    EMCP-II (details on page 11), coupling to
  - **Woodward GCP-30 Series** via CAN bus (display and control)

Chapter 2.
Option SB03

NOTE

Please take information about the function of the CCM and the engine controls EMCP-II and ECM from the manufacturer's manual.

The option SB03 enables the operation of a engine RS-232 interface with the following devices, which can be selected and activated via the configuration.

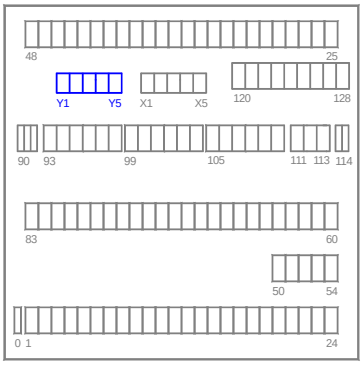
- EMCP-II from Caterpillar to visualize the data via a Caterpillar CCM,
- ECM from Caterpillar to visualize the data via a Caterpillar CCM. A GCP can be operated as follows to visualize the ECM:

  - Parameter setting "ECM"
    Only a display of measured values and their sensor defective message appears

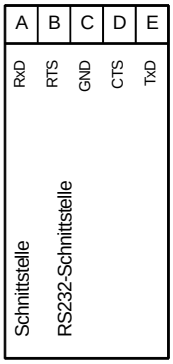
  - Parameter setting "ECM+"
    A display of measured values and their sensor defective message as well as the display of events and stopping alarms appears. These alarms can be acknowledged.

Connection

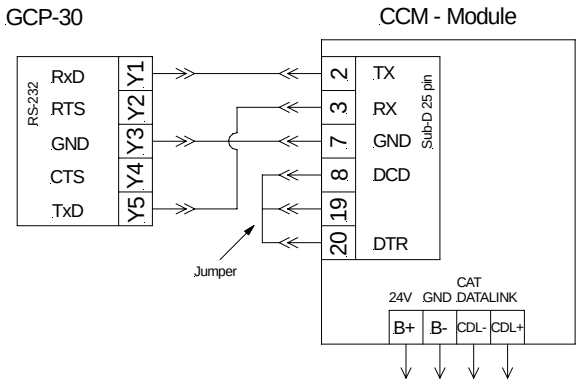
rear view:



terminal layout



A (Y1)	B (Y2)	C (Y3)	D (Y4)	E (Y5)	
RxD	RTS	GND	CTS	TxD	RS-232



Configuration

```
Configure
engine bus   YES
```

Configuration of the engine bus **YES/NO**

In order to ensure a fast proceeding inside the very extensive configuration masks, various groups of parameters are summarized to blocks. Setting to "YES" or "NO" has no effect, whether the control, monitoring, etc. is performed or not. The setting has only the following effects:

YES .....The configuration masks of the following block are displayed and can either only be viewed (key "Select") or changes on the parameters can be performed (keys "Cursor→", "Digit↑" or "Select"). A decision, whether the parameters are worked off or not, will not be made.

NO .....The parameters of the following block are not displayed, can not be changed, and are skipped therefore.

```
CCM
---------------
```

Type engine electronic **OFF / EMCP-II / ECM / ECM+**

OFF .....The coupling to Caterpillar CCM is disabled and no CCM data is processed.

EMCP-II.....The data coupling to Caterpillar EMCP-II via the CCM is enabled, EMCP-II values are received via the CCM, and the following parameters are displayed according to the address table EMCP-II.

ECM.....The data coupling to Caterpillar ECM via the CCM is enabled, ECM values are received via the CCM, and the following parameters are displayed according to the address table ECM. Fault messages from the active fault storage are not displayed.

ECM+ .....The data coupling to Caterpillar ECM via the CCM is enabled, ECM values are received via the CCM, the following parameters are displayed according to the address table ECM, and values are sent to the ECM via the CCM. Additionally, fault messages from the active fault storage are displayed.

(The display values are overwritten with question marks in case of an interface fault, triggered by the CCM.)

Acknowledgement of ECM alarm messages – If the parameter setting "ECM+" has been selected, the GCP displays alarm messages (AL) and stopping faults (ST) additionally to the sensor defective messages (SD). As soon as the alarm messages are not active anymore, they can be acknowledged using the acknowledgement key ("RESET"). Now, the GCP sends a reset sequence to the engine control ECM. Since the acknowledgement may take some seconds, the message "ECM fail. Reset" is displayed during this time.

Display

Description	Display / Messages German	Display / Messages English	EMCP-II PID	ECM PID	ECM+ PID/EID, WIC
Display: coolant temperature /#1	**Kühlmittelt.000C**	**Coolant 000°C**	0044	0044	0044
Display: oil pressure /#1	**Öldruck 000,0bar**	**OilPres.000,0bar**	0054	0054	0054
Display: raw water temperature /#1	**Rohwassert. 000C**	**RawWater 000°C**	---	D001EF	D001EF
Display: turbo charger intake temp. /#1	**Turbo Eintr.000C**	**TurboIn.000°C**	---	D00282	D00282
Display: oil temperature /#1	**Öltemp. 000C**	**Oil temp. 000C**	F53E /#1	F53E	F53E
Display: intake manifold temperatur /#1	**Ansaugtemp. 000C**	**Manifold 000C**	---	F511	F511
Display: throttle position	**Drosselk.pos 000**	**Throttle pos 000**	---	0015 /#2	0015 /#2
Display: engine speed	**Drehz.0000 1/min**	**Engine 0000rpm**	0040	---	---
Alarm: SD coolant temperature	**SD:Kühlmitt.temp**	**SD:Coolant temp.**	0044	0044	0044
Alarm: SD oil pressure	**SD Öldruck**	**SD Oil pressure**	0054	0054	0054
Alarm: SD speed (pickup)	**SD Drehzahl**	**SD Pickup**	0040	0040	0040
Alarm: SD oil temperature	**SD Öltemperatur**	**SD Oil temp.**	F53E	F53E	F53E
Alarm: SD raw water temperature	**SD Rohwassertemp**	**SD Raw water tmp**	---	D001EF	D001EF
Alarm: SD turbo charger intake temperature	**SD Turbo Ein.Tmp**	**SD Turb.Inl.Temp**	---	D00282	D00282
Alarm: SD intake manifold temperature	**SD Ansaugtemp**	**SD Inl.Manif.tmp**	---	F511	F511
Display: status engine control = off	**ECU Status: AUS**	**ECU status: OFF**	F08F	F119	F119
		not defined	F08F	---	---
Display: status engine control = start	**ECU Status:START**	**ECU status:START**	F08F	F119	F119
Display: status engine control = stop	**ECU Status: STOP**	**ECU status: STOP**	F08F	F119	F119
Display: status eng. contr. = automatic	**ECU Status: AUTO**	**ECU status: AUTO**	F08F	F119	F119
Alarm: AL oil temperature	**AL Öltemperatur**	**AL Oil temp.**	F460	---	20,1
Alarm: AL oil pressure	**AL Öldr. niedr.**	**AL Low oil pr.**	F460	---	100,1
Alarm: AL coolant temp. too low	**AL Kühlm.t.nied.**	**AL Low Cool.Tmp**	F460	---	---
Alarm: AL coolant temp. too high	**AL Kühlm.t. hoch**	**AL High Cool.Tmp**	F460	---	16,1
Alarm: ST engine overspeed	**ST Überdrehzahl**	**ST Overspeed**	F461	---	4,3
Alarm: ST start failure	**ST Startfehler**	**ST Overcrank**	F461	---	225,3
Alarm: ST oil pressure too low	**ST Öldr. niedrig**	**ST Low oil pr.**	F461	---	40,3
Alarm: ST coolant temp. too high	**ST Kühlm.t hoch**	**ST High Cool.Tmp**	F461	---	17,3
Alarm: ST EMERGENCY STOP	**ST Notaus**	**ST Emergency**	F461	---	F119 / 264,3
Alarm: ST coolant loss	**ST Kühlm.verlust**	**ST Coolant loss**	F461	---	---

SD..sensor defectice, ST..stop, AL..alarm; **#1** switchable: bar ↔ psi, or °C ↔ °F.

Description	Display / Messages		EMCP-II	ECM	ECM+
	German	English	PID	PID	PID/EID, WIC
Alarm: ST battery voltage	**ST Batteriespg.**	**ST Low V Battery**	---	---	42,3
Alarm: AL gas pressure too low	**AL Gasdr.niedrig**	**AL Low GasPress.**	---	---	53,1
Alarm: AL oil pressure too high	**AL Öldr. hoch**	**AL High oil pr.**	---	---	125,1
Alarm: ST oil pressure too high	**ST Öldr. hoch**	**ST High oil pr.**	---	---	126,FF
Alarm: AL coolant loss	**AL Kühlm.verlust**	**AL Coolant loss**	---	---	131,1
Alarm: ST spitback	**ST Spitback**	**ST Spitback**	---	---	163,3
Alarm: AL raw water temperature	**AL Rohwassertemp**	**AL Raw WaterTemp**	---	---	251,1
Alarm: ST raw water temperature	**ST Rohwassertemp**	**ST Raw WaterTemp**	---	---	251,3
Display: ignition cylinder 1	**Deton.Zyl. 1**	**Deton.Cyl. 1**	---	---	421,3
Display: ignition cylinder 2	**Deton.Zyl. 2**	**Deton.Cyl. 2**	---	---	422,3
Display: ignition cylinder 3	**Deton.Zyl. 3**	**Deton.Cyl. 3**	---	---	423,3
Display: ignition cylinder 4	**Deton.Zyl. 4**	**Deton.Cyl. 4**	---	---	424,3
Display: ignition cylinder 5	**Deton.Zyl. 5**	**Deton.Cyl. 5**	---	---	425,3
Display: ignition cylinder 6	**Deton.Zyl. 6**	**Deton.Cyl. 6**	---	---	426,3
Display: ignition cylinder 7	**Deton.Zyl. 7**	**Deton.Cyl. 7**	---	---	427,3
Display: ignition cylinder 8	**Deton.Zyl. 8**	**Deton.Cyl. 8**	---	---	428,3
Display: ignition cylinder 9	**Deton.Zyl. 9**	**Deton.Cyl. 9**	---	---	429,3
Display: ignition cylinder 10	**Deton.Zyl. 10**	**Deton.Cyl. 10**	---	---	430,3
Display: ignition cylinder 11	**Deton.Zyl. 11**	**Deton.Cyl. 11**	---	---	431,3
Display: ignition cylinder 12	**Deton.Zyl. 12**	**Deton.Cyl. 12**	---	---	432,3
Display: ignition cylinder 13	**Deton.Zyl. 13**	**Deton.Cyl. 13**	---	---	433,3
Display: ignition cylinder 14	**Deton.Zyl. 14**	**Deton.Cyl. 14**	---	---	434,3
Display: ignition cylinder 15	**Deton.Zyl. 15**	**Deton.Cyl. 15**	---	---	435,3
Display: ignition cylinder 16	**Deton.Zyl. 16**	**Deton.Cyl. 16**	---	---	436,3
Alarm: AL turbo charger intake temp.	**AL Trb.EIN.Temp**	**AL Trb.Inl:Temp**	---	---	870,1
Alarm: ST turbo charger intake temp.	**ST Trb.EIN.Temp**	**ST Trb.Inl:Temp**	---	---	870,2
Alarm: AL oil level	**AL Ölstand**	**Al Low oil level**	---	---	171,1
Alarm: ST fuel quality	**ST Kraftst.Qual.**	**ST Fuel quality**	---	---	231,3
Alarm: ST oil temperature	**ST Öltemperatur**	**ST Oil temp.**	---	---	19,3

SD..sensor defectice, ST..stop, AL..alarm; **#1** switchable: bar ↔ psi, or °C ↔ °F.

Send Telegram 'Guidance Bus Of The GCP-30'

NOTE

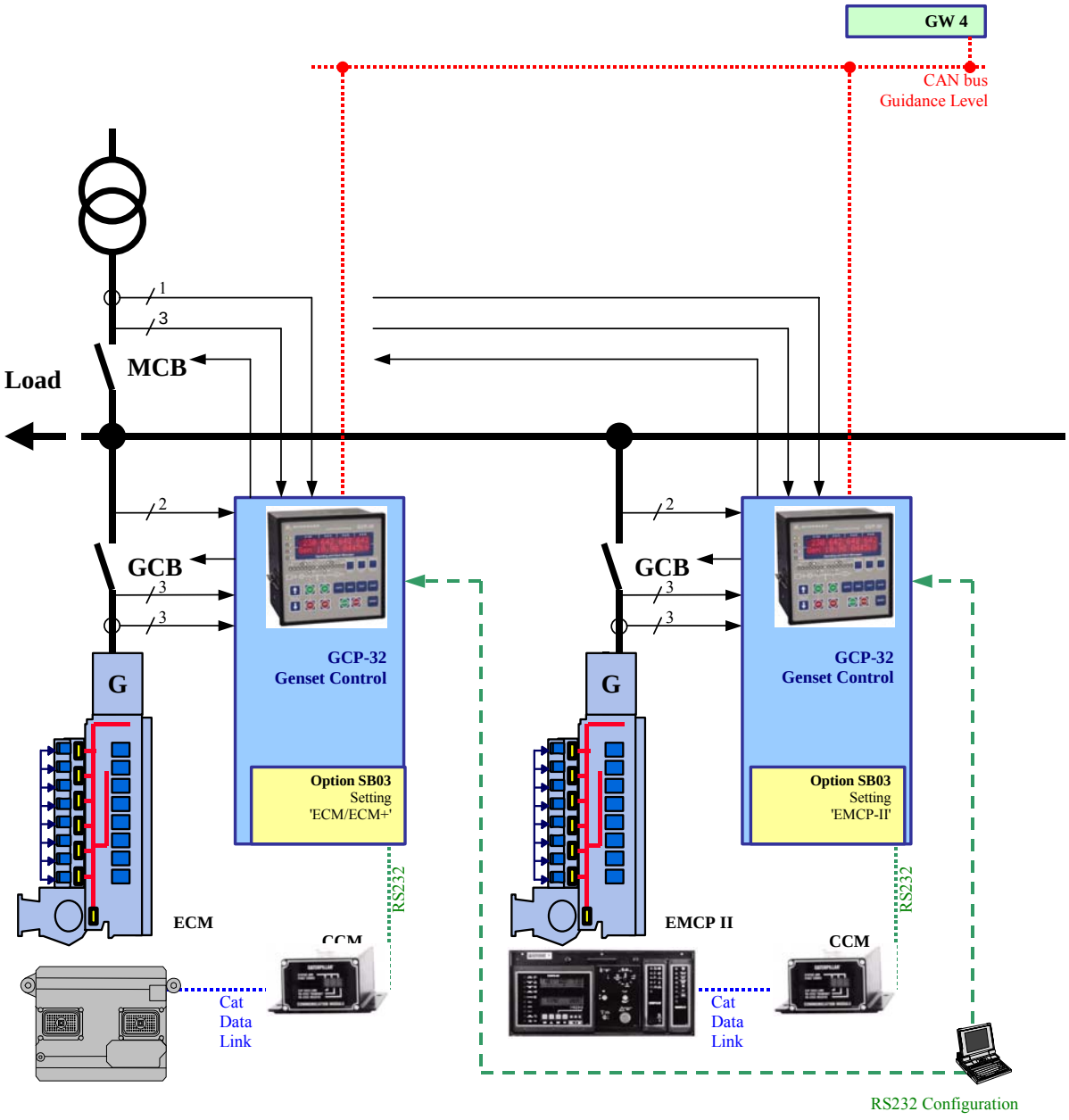
The following data is transferred in the 'extended blocks' of the GCP. The data volume, which is added due to the 'extended blocks', has the result, that a gateway GW 4 can only transfer the data of the first four GCPs. If it is necessary that all data of all GCPs has to be transferred, a second gateway GW 4 has to be used.

MUX	No.	Content (words)	Unit	Comment	
23/1	**70**	Coolant temperature	°C/°F	Switchable: °C ↔ °F	
23/2	**71**	Oil pressure	bar/psi × 0,1	Switchable: bar ↔ psi	
23/3	**72**	Raw water temperature	°C/°F	Switchable: °C ↔ °F	
24/1	**73**	Turbo charger intake temperature	°C/°F	Switchable: °C ↔ °F	
24/2	**74**	Oil temperature	°C/°F	Switchable: °C ↔ °F	
24/3	**75**	Intake manifold temperature	°C/°F	Switchable: °C ↔ °F	
25/1	**76**	Throttle position	%		
25/2	**77**	Engine speed	min^{-1}		
25/3	**78**	ECU alarms 1		Bit 15 = 1	Internal
				Bit 14 = 1	Internal
				Bit 13 = 1	Internal
				Bit 12 = 1	ECU status: automatic
				Bit 11 = 1	ECU status: start
				Bit 10 = 1	ECU status: stop
				Bit 9 = 1	Internal
				Bit 8 = 1	ECU status: off
				Bit 7 = 1	Internal
				Bit 6 = 1	SD: intake manifold temperature
				Bit 5 = 1	SD: turbo charger intake temperature
				Bit 4 = 1	SD: raw water temperature
				Bit 3 = 1	SD: oil temperature
				Bit 2 = 1	SD: speed
		SD..sensor defective AL..alarm ST..STOP		Bit 1 = 1	SD: oil pressure
				Bit 0 = 1	SD: coolant temperature
26/1	**79**	ECU alarms 2		Bit 15 = 1	ST: (spitback) rotation direction
				Bit 14 = 1	ST: coolant loss
				Bit 13 = 1	ST: oil pressure too high
				Bit 12 = 1	AL: oil pressure too high
				Bit 11 = 1	AL: gas pressure too low
				Bit 10 = 1	ST: battery voltage
				Bit 9 = 1	ST: coolant loss
				Bit 8 = 1	ST: EMERGENCY STOP
				Bit 7 = 1	ST: coolant temperature too high
				Bit 6 = 1	ST: oil pressure too low
				Bit 5 = 1	ST: start failure
				Bit 4 = 1	ST: overspeed
				Bit 3 = 1	AL: coolant temperature too high
				Bit 2 = 1	AL: coolant temperature too low
		SD..sensor defective AL..alarm ST..STOP		Bit 1 = 1	AL: oil pressure too low
				Bit 0 = 1	AL: oil temperature

MUX	No.	Content (words)	Unit	Comment	
26/2	**80**	ECU alarms 3		Bit 15 = 1	ST: ignition cylinder 13
				Bit 14 = 1	ST: ignition cylinder 12
				Bit 13 = 1	ST: ignition cylinder 11
				Bit 12 = 1	ST: ignition cylinder 10
				Bit 11 = 1	ST: ignition cylinder 9
				Bit 10 = 1	ST: ignition cylinder 8
				Bit 9 = 1	ST: ignition cylinder 7
				Bit 8 = 1	ST: ignition cylinder 6
				Bit 7 = 1	ST: ignition cylinder 5
				Bit 6 = 1	ST: ignition cylinder 4
				Bit 5 = 1	ST: ignition cylinder 3
				Bit 4 = 1	ST: ignition cylinder 2
				Bit 3 = 1	ST: ignition cylinder 1
				Bit 2 = 1	Internal
		SD..sensor defective AL..alarm		Bit 1 = 1	ST: raw water temperature
		ST..STOP		Bit 0 = 1	AL: raw water temperature
26/3	**81**	ECU alarms 4		Bit 15 = 1	Internal
				Bit 14 = 1	Internal
				Bit 13 = 1	Internal
				Bit 12 = 1	Internal
				Bit 11 = 1	Internal
				Bit 10 = 1	Internal
				Bit 9 = 1	Internal
				Bit 8 = 1	Internal
				Bit 7 = 1	ST: oil temperature
				Bit 6 = 1	ST: fuel quality
				Bit 5 = 1	AL: oil level
				Bit 4 = 1	ST: turbo intake temperature
				Bit 3 = 1	AL: turbo intake temperature
		SD..sensor defective AL..alarm		Bit 2 = 1	ST: ignition cylinder 16
				Bit 1 = 1	ST: ignition cylinder 15
		ST..STOP		Bit 0 = 1	ST: ignition cylinder 14

Chapter 3.
Caterpillar ECM And EMCP-II

The Caterpillar engine controls ECM and EMCP-II are connected to a Woodward genset control GCP via a Caterpillar CCM communication module and a RS-232 interface.



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Please send comments to: stgt-documentation@woodward.com

Please include the manual number from the front cover of this publication.

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