WOODWARD

SEG

PCM1x Packages (Pxx) Functional Description
Engine-RS232-Interface

Contents

TD_PCM1x_Packages_Engine_RS232_Interface_08.04_GB

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

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overtemperature, or over-pressure, where applicable) shutdown device(s), that operates totally independently of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with 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 controlled device(s) fail.

CAUTION

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery 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 the components or conductors on a printed circuit board with your hands or with conductive devices.

IMPORTANT DEFINITIONS

WARNING

To avoid the destruction of electric components due to improper handling, please read and adhere to the relevant notes.

CAUTION

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

NOTE

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

1   Introduction

⚠️ **CAUTION**

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

This manual describes the following options:

- - Caterpillar **CCM coupling to**
    ECM **(details on page 11) and**
    EMCP-II **(details on page 11), coupling to**
  - SEG PCM1x Series **via RS232 interface (display and control)**

2   Package P01

NOTE

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

The package P01 enables the operation of a engine RS232 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 PCM1x 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.

2.1   Connection

rear view: terminal layout
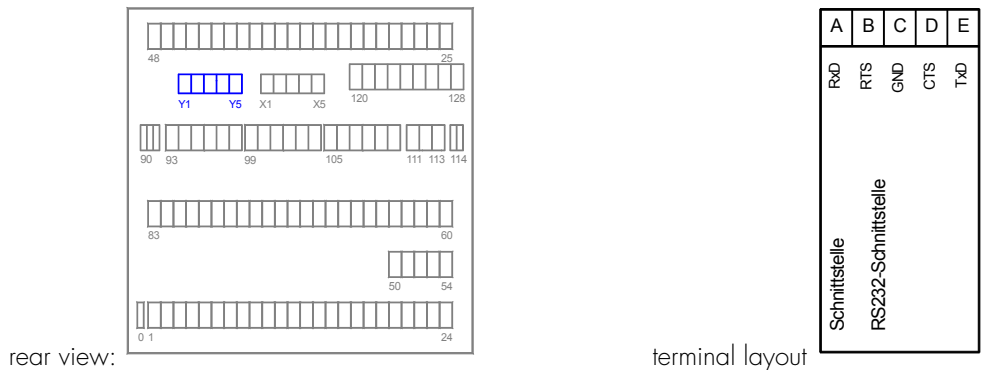
A (Y1)	B (Y2)	C (Y3)	D (Y4)	E (Y5)	
RxD	RTS	GND	CTS	TxD	RS232
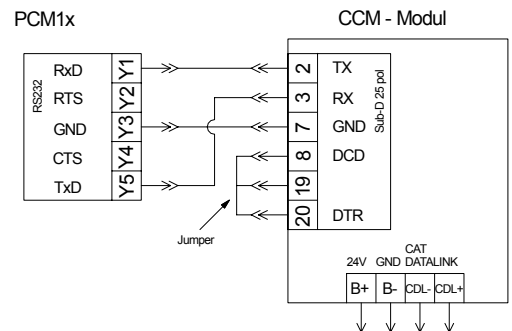
2.2   Configuration

```
┌─────────────────────────┐
│ 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 PCM1x 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 PCM1x 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.

2.3 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 German	English	EMCP-II PID	ECM PID	ECM+ 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.

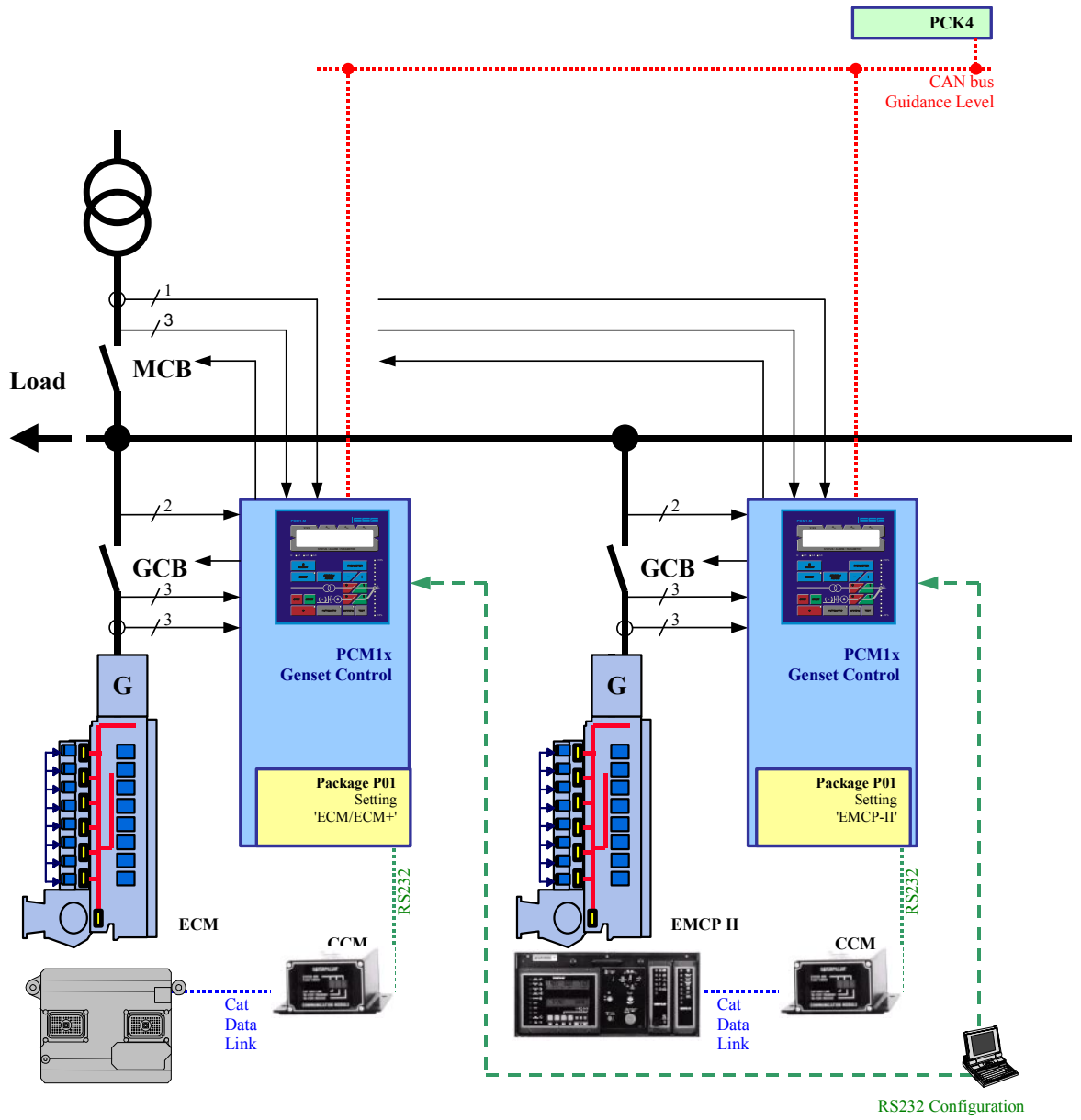## 2.4 Send Telegram 'Guidance Bus Of The PCM1x'

ℹ NOTE

The following data is transferred in the 'extended blocks' of the PCM1x. The data volume, which is added due to the 'extended blocks', has the result, that a gateway PCK4 can only transfer the data of the first four PCM1xs. If it is necessary that all data of all PCM1xs has to be transferred, a second gateway PCK4 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
		SD..sensor defective		Bit 2 = 1	SD: speed
		AL..alarm		Bit 1 = 1	SD: oil pressure
		ST..STOP		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		Bit 1 = 1	AL: oil pressure too low
		AL..alarm		Bit 0 = 1	AL: oil temperature
		ST..STOP			

MUX	No.	Content (words)	Unit	Comment	
27/1	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		Bit 1 = 1	ST: raw water temperature
		AL..alarm ST..STOP		Bit 0 = 1	AL: raw water temperature
26/1	79	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
				Bit 2 = 1	ST: ignition cylinder 16
		SD..sensor defective		Bit 1 = 1	ST: ignition cylinder 15
		AL..alarm ST..STOP		Bit 0 = 1	ST: ignition cylinder 14

3   Caterpillar ECM And EMCP-II

The Caterpillar engine controls ECM and EMCP-II are connected to a SEG genset control PCM1x via a Caterpillar CCM communication module and a RS232 interface.