37236A

Option SC04
IKD1 & ST3 Coupling

Functional Description
GCP-30 from Software Version 4.1000

Manual 37236A

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 overpressure, 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

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

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.

Contents

Chapter 1.
General Information

CAUTION

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

This manual describes the following options:

- **Option SC04**
  - Woodward IKD 1 (2 pcs; details in manual 37135),
  - Woodward ST 3 (unit 2; details in manual 37112), coupling to
  - Woodward GCP-30 Series

The option SC04 allows to operate the above mentioned devices at the CAN engine bus.

The connected devices have to be enabled using the configuration.

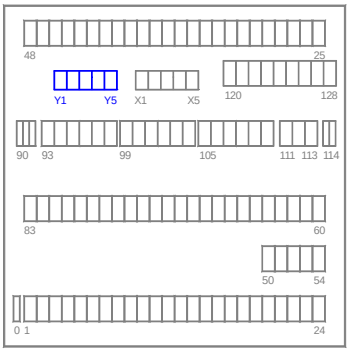
Chapter 2.
Option SC04

The Option SC04 enables to operate the GCP together with 2 expansion cards IKD1 and a lambda controller ST3.

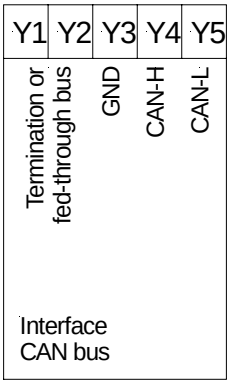
- IKD1 digital expansion board (unit 1) from Woodward,
- IKD1 digital expansion board (unit 2) from Woodward,
- ST3 lambda controller from Woodward,

Connection

back view:



terminal assignment



A (Y1)	B (Y2)	C (Y3)	D (Y4)	E (Y5)	
CAN-L [1]	CAN-H [1]	GND	CAN-H	CAN-L	CAN bus (engine bus)

[1]..may be used for feeding through the CAN bus to other participants or for connecting the termination reisitor.

Configuration

IKD 1 - Digital Extension Board

NOTE

Please take the following functios of the IKD 1 from the Woodward manual 37135.

NOTE

You find the following configuration screens in the GCP after the counter configuration screens.

```
Configure
IKDx              JA
```

[x = 1/2]

Configuration of the IKDx **YES/NO**

To ensure a fast proceeding in the extensive configuration screens, different parameter groups are grouped in blocks. A setting to "YES" or "NO" has no influence on the fact whether a control, monitoring, etc. is performed or not. The entry has only the following effects:

YES .....The configuration screens of the following blocks are displayed and can either be enabled ("Select" button) or parameter changes can be performed ("Cursor→", "Digit↑" or "Select" buttons). A decision whether the parameters are processed will not be made.

NO .....The parameters of the following block are skipped, i.e. they are not displayed and cannot be changed.

```
IKDx on bus
                  NO
```

IKDx JA [x = 1/2]

IKD 1.x on bus **YES/NO**

YES .....The IKD 1 functions are activated. Moreover, it is monitored whether the IKD 1.{x} is connected to the engine bus. If this parameter is set to YES, but the IKD 1.{x} is not connected to the CAN bus, an interface error will be triggered in the GCP.

NO .....The functions of the IKD 1 are locked and no communication monitoring to IKD1.{x} is performed.

Note to IKD 1 interface error - The "interface error Y1Y5" with alarm class 1 is triggered, if the GCP does not receive a message from an operating IKD 1 for about 5 s.

IKD 1 Discrete Inputs

The parameters are at the end of the GCP configuration file. Please note that you may have to perform additional settings (e.g. normally open/closed, delay, alarm class, etc.) directly at the IKD 1 via direct configuration if necessary. Please observe the IKD 1 manual about this.

Error text DI{x} IKD{y} (term. {z}) [x = 1..8] / [y = 1/2] / [z = 5..12]	**Configuration of the IKD 1.y alarm texts** The discrete input {x} (term. {y}) on the IKD 1.{z} displays the text configured here at the GCP display.

Example: Discrete input 5 on the IKD 1.1

Error text DI5 IKD1 (term. 9)	**Configuration of the IKD 1.1 alarm texts** The discrete input 5 (term. 9) on the IKD 1.1 displays the text configured here at the GCP display.

IKD 1 Relay Outputs

The parameters are at the end of the GCP configuration file. Please note that you may have to perform additional settings directly at the IKD 1 via direct configuration if necessary. Please observe the IKD 1 manual about this.

Assignment {x}. relay on IKD{y} [x = 1..8] / [y = 1/2]	**Configuration of the relay outputs on the IKD 1.y** The relay {x} on the IKD 1.{y} energizes if the configured logical condition is fulfilled.

Example: Relay 2 on the IKD 1.2

Assignment 2. relay on IKD2	**Configuration of the 2nd relay on the IKD 1.2** The relay 2 on the IKD 1.2 energizes if the configured logical condition is fulfilled.

Relay Manager

No.	Outputs	Comment
...	...	
98	IKD 1.[1] - discrete input [1]	
99	IKD 1.[1] - discrete input [2]	
100	IKD 1.[1] - discrete input [3]	
101	IKD 1.[1] - discrete input [4]	
102	IKD 1.[1] - discrete input [5]	
103	IKD 1.[1] - discrete input [6]	
104	IKD 1.[1] - discrete input [7]	
105	IKD 1.[1] - discrete input [8]	
106	IKD 1.[2] - discrete input [1]	
107	IKD 1.[2] - discrete input [2]	
108	IKD 1.[2] - discrete input [3]	
109	IKD 1.[2] - discrete input [4]	
110	IKD 1.[2] - discrete input [5]	
111	IKD 1.[2] - discrete input [6]	
112	IKD 1.[2] - discrete input [7]	
113	IKD 1.[2] - discrete input [8]	
...	...	
134	Communication with IKD1.[1] okay	
135	Communication with IKD1.[2] okay	
..	..	

Send Telegram 'Guidance Bus of the GCP-30'

MUX	No.	Content (words)	Unit	Comment	
...	...	...			
4/1	13	IKD 1 alarms		Bit 15 = 1	IKD 1.[1] - discrete input [8]
				Bit 14 = 1	IKD 1.[1] - discrete input [7]
				Bit 13 = 1	IKD 1.[1] - discrete input [6]
				Bit 12 = 1	IKD 1.[1] - discrete input [5]
				Bit 11 = 1	IKD 1.[1] - discrete input [4]
				Bit 10 = 1	IKD 1.[1] - discrete input [3]
				Bit 9 = 1	IKD 1.[1] - discrete input [2]
				Bit 8 = 1	IKD 1.[1] - discrete input [1]
				Bit 7 = 1	
				Bit 6 = 1	
				Bit 5 = 1	
				Bit 4 = 1	
				Bit 3 = 1	
				Bit 2 = 1	
				Bit 1 = 1	
				Bit 0 = 1	
...	...	...			
22/2	68	IKD 1.[2] alarms		Bit 15 = 1	IKD 1.[2] - discrete input [1]
				Bit 14 = 1	IKD 1.[2] - discrete input [2]
				Bit 13 = 1	IKD 1.[2] - discrete input [3]
				Bit 12 = 1	IKD 1.[2] - discrete input [4]
				Bit 11 = 1	IKD 1.[2] - discrete input [5]
				Bit 10 = 1	IKD 1.[2] - discrete input [6]
				Bit 9 = 1	IKD 1.[2] - discrete input [7]
				Bit 8 = 1	IKD 1.[2] - discrete input [8]
				Bit 7 = 1	
				Bit 6 = 1	
				Bit 5 = 1	
				Bit 4 = 1	
				Bit 3 = 1	
				Bit 2 = 1	
				Bit 1 = 1	
				Bit 0 = 1	
...	...	...			

ST 3 - Lambda Controller

NOTE

Please take information about the ST 3 functions from the Woodward manual 37112.

Parameter

```
ST3 am Bus
          NEIN
```

ST 3 on engine bus **YES/NO**

YES .....The ST 3 functions are activated. Moreover, it is monitored whether the ST 3 is connected to the engine bus. If this parameter is set to YES, but the ST 3 is not connected to the CAN bus, an interface error will be triggered in the GCP.

NO .....The ST 3 functions are locked and the communication to the ST 3 is not monitored.

Note: Ensure that the ST 3 controller is configured correctly. Enter 6 as **Node-ID** there.

Note to ST 3 interface error - The "interface error Y1Y5" with alarm class 1 is triggered, if the GCP does not receive a message from the ST 3 for about 5 s. The ST 3 display values are overwritten with "0".

Functional Description GCP-30 with ST 3 Coupling

Displays

Three ST 3 values are transferred to the GCP and displayed in the GCP online display as follows:
Lambda set value and actual values in screen: "L: Se0,00 Ac0,00"
Actuator position in % in screen: "P.actu: 000,00%"

Error message lambda probe

If the ST 3 detects a malfunction of the lambda probe, the error message 'Lambda probe' appears with alarm class 1 in the display.

GCP commands to the ST 3 controller

The GCP sends the following commands to the ST 3 controller depending on the respective operation state:

- Leave stop position
  This command is sent to the ST 3 controller as long as the GCP controls the auxiliary drives (pre-run and post-run auxiliary drives).
  (In operation mode manual, the auxiliary drives are always controlled and therefore, the message "Leave stop position" is always sent.)

- Release lambda control
  This command is sent to the ST 3 controller as long as the reply "GLS closed"
  is present at the GCP.

- Initialization of the stepper motor
  This command is sent to the ST 3 controller for approx. 200ms as soon as the auxiliary drives pre-run is started.

Additionally, the GCP sends the actual value of the generator real power for the control to the ST 3 controller.

Manual adjustment of the actuator position:

The actuator position can be adjusted manually using the higher/lower buttons of the GCP. To do this, the GCP has to be in manual operation mode and the actuator position display has to be visible.

Relay Manager

No.	Outputs	Comment
...	...	
129	Error lambda probe (via CAN bus)	
130	Activate lambda probe	
..	..	

Send Telegram 'Guidance Bus of the GCP-30'

MUX	No.	Content (words)	Unit	Comment	
...	**...**	...			
19/3	**60**	Internal alarms 7		Bit 15 = 1	
				Bit 14 = 1	
				Bit 13 = 1	Alarm ST3: lambda probe
				Bit 12 = 1	
				Bit 11 = 1	
				Bit 10 = 1	
				Bit 9 = 1	
				Bit 8 = 1	
				Bit 7 = 1	
				Bit 6 = 1	
				Bit 5 = 1	
				Bit 4 = 1	
				Bit 3 = 1	
				Bit 2 = 1	
				Bit 1 = 1	
				Bit 0 = 1	
...	**...**				
23/1	**70**	Lambda set value	× 100		
23/2	**71**	Lambda actual value	× 100		
23/3	**72**	Actuator position	× 0,01 %		
...	**...**	...			

We appreciate your comments about the content of our publications.

Please send comments to: icinfo@woodward.com

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

Woodward Governor Company
Leonhard-Reglerbau GmbH
Handwerkstrasse 29 - 70565 Stuttgart - Germany
Phone +49 (0) 711-789 54-0 • Fax +49 (0) 711-789 54-100
sales-stuttgart@woodward.com

Homepage

http://www.woodward.com/smart-power

Woodward has company-owned plants, subsidiaries, and branches, as well as authorized distributors and other authorized service and sales facilities throughout the world.

Complete address/phone/fax/e-mail information for all locations is available on our website (www.woodward.com).

04/9/S