Dräger

REGARD
GAS DETECTION SYSTEM

8-INPUT 4-20 MODULE
8-CHANNEL DISPLAY CARD

Dräger

h1 : 0

8-CHANNEL DISPLAY

○ A3
○ A2
○ A1
○ Fault
○ Power
○ Inhibit

● SHIFT ● R

● → ● ↑

● ← ● ↓

0 V
24V
0 V
24V
B
A

24V
CH1
0 V

24V
CH2
0 V

24V
CH3
0 V

24V
CH4
0 V

24V
CH5
0 V

24V
CH6
0 V

24V
CH7
0 V

24V
CH8
0 V
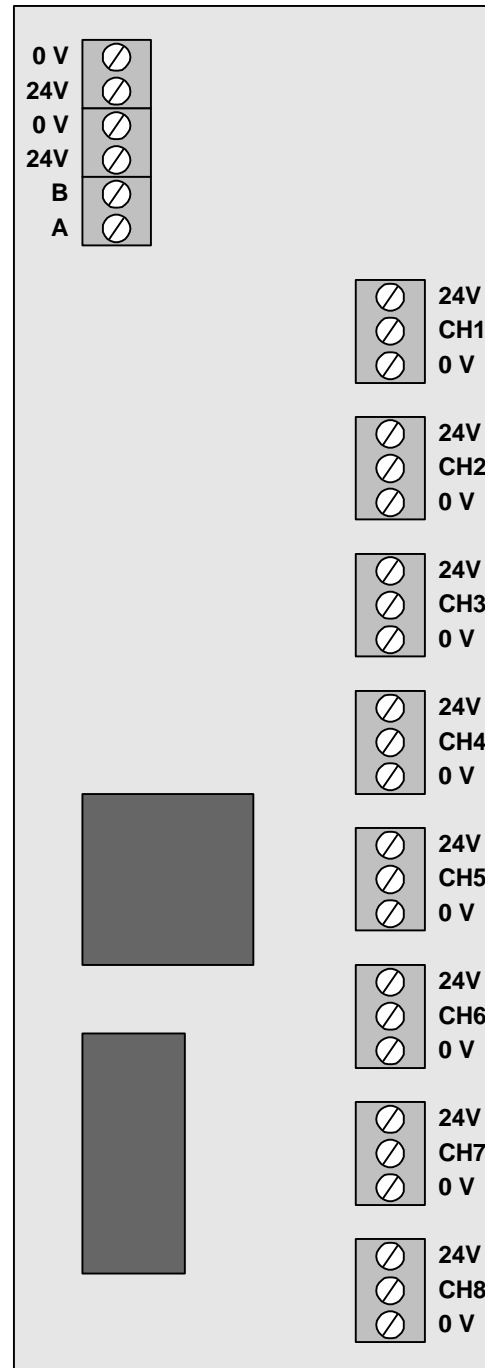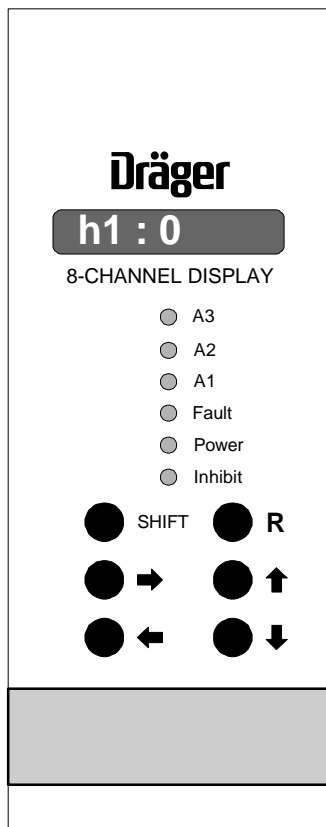
INSTRUCTIONS FOR USE

CONTENTS

FOR YOUR SAFETY

Follow the instructions

Follow the instructions for installation, operation and maintenance.

Use in areas subject to explosion hazards

The 8-input 4-20 module and 8-channel display card are not designed for use in a flammable atmosphere without suitable protection.

Liability for proper function or damage

Liability for proper function of this apparatus is irrevocably transferred to the owner or operator to the extent that the apparatus has been commissioned, serviced or repaired by personnel not employed or authorised by Draeger Service, or when this apparatus was used in a manner not conforming to its intended use.

Draeger Limited can not be held responsible for any damage caused by non-compliance with the above recommendations. The warranty and liability provisions of the terms and conditions of sale and delivery of Draeger Limited are likewise not modified by recommendations given above.

Maintenance

This apparatus must be inspected and serviced by experts at regular intervals and a record maintained of such inspections and servicing. Repairs and general overhaul of this apparatus should only be carried out by competent personnel.

We recommend that either a training course or service contract is obtained from DraegerService and that all repairs are carried out by them.

OPERATION

Intended use

The REGARD 8-channel display card and 8-input 4-20 module provide:

- Measurement and display of gas level with gas measuring heads (transmitters) such as Polytron 2. The equipment can be used with any 4-20mA transmitter.
- Activation of alarms when pre-set gas levels are exceeded.

The input module and display card are intended for permanent installation in a non-hazardous environment, such as a control room or marshalling cabinet.

Description

The 8-input 4-20 module takes signals from up to eight 2-wire or 3-wire 4-20mA measuring heads (transmitters). The module provides terminals for field cables and DC power to the transmitters. Signals from the eight inputs are multiplexed onto an RS-485 connection for transmission to the 8-channel display card. The display card displays the gas level of each head and indicates alarm and fault conditions.

The display card has three alarm relays for

- A1 gas alarm
- A2 gas alarm
- Fault alarm or A3 gas alarm (user-configurable)

Each 8-input module requires an 8-channel display card. Only one module can be connected to a display card.

The input module and display card can be located in separate enclosures or buildings. The maximum distance of the RS-485 cable between the module and display card is 1km.

Electromagnetic compatibility (EMC)

The Regard 8-input 4-20 module and display card have been tested for compliance with the EMC Directive. Take the following steps to ensure compliance:

- Fully follow the installation instructions
- Observe instructions to use screened cable, where given

Instructions or precautions that are essential for electromagnetic compatibility are identified by "**EMC!**" in the margin.

Display card front panel controls and indicators

Display

Display normally shows gas level of each head in sequence. When an alarm occurs, display shows gas level of head(s) in alarm only.

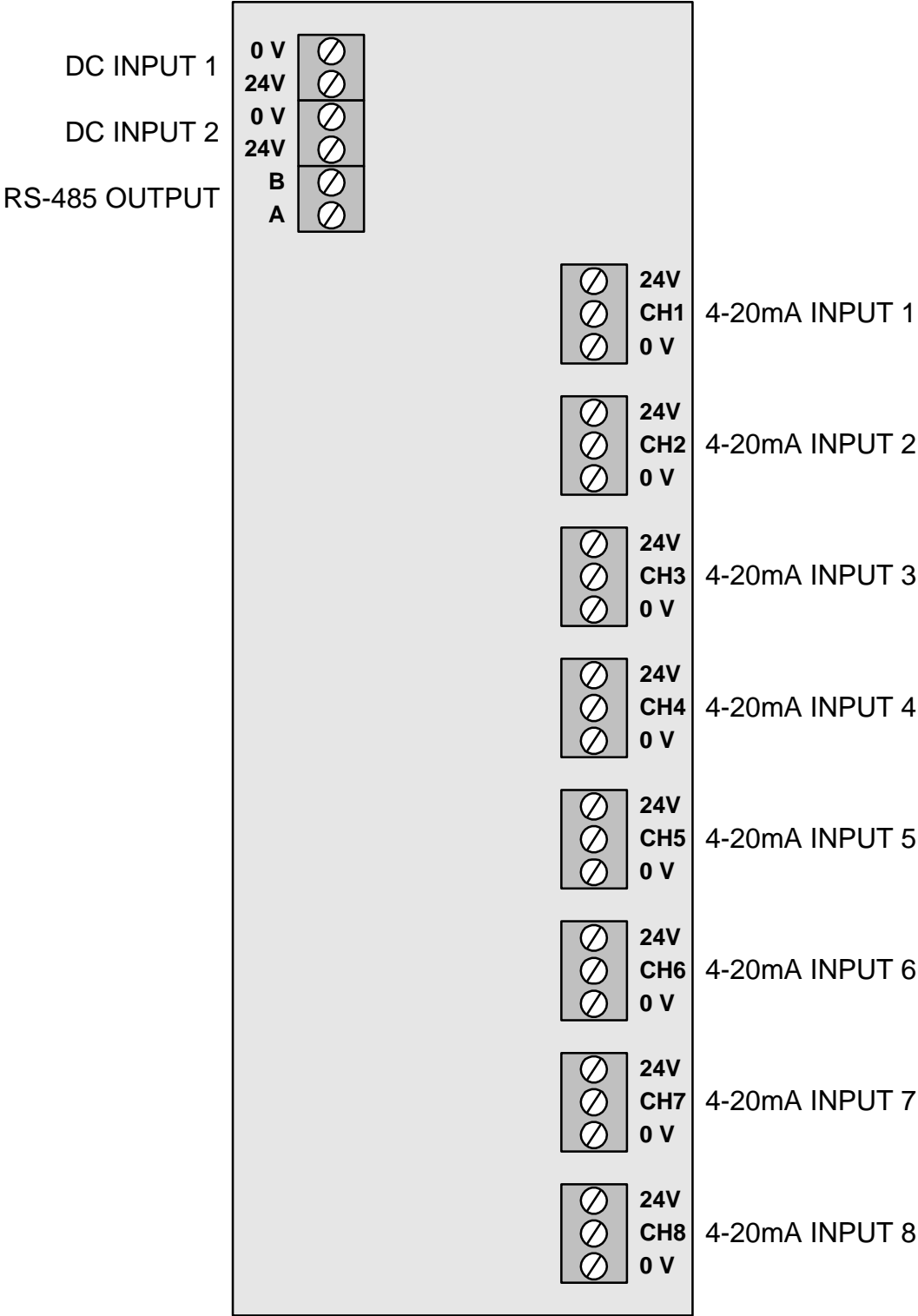| Display	Meaning
h1:0	Gas level for head 1 (gas level is 0)
h8:3	Gas level for head 8 (gas level is 3)
36:12	Alternative display of gas level, showing Regard channel number instead of head number. (E.g. gas level of channel 36 is 12.)
FAULT..	Operational fault

LEDs

LED	State	Meaning
A3 **A2** **A1** **Fault**	Off	No alarm
	Flashing	Alarm tripped, not acknowledged
	On	Alarm tripped & acknowledged
Power	On	DC power on
	Flashing	Operational fault
Inhibit	On	Relays inhibited
	Blinking on (normally off, on every 2.5 s)	Relay(s) disabled
	Blinking off (normally on, off every 2.5 s)	Relays inhibited + relays disabled

Push buttons

Function of front panel controls during normal operation:

Push button	Function
⬆	Display gas name. E.g. **h1:CO2**
⬇	Display gas units. E.g. **h2:PPM**
SHIFT + ⬆	Display A1 trip level. Arrow after number indicates: ⬆ rising alarm ⬇ falling alarm E.g. **h3:20⬆**
SHIFT + ⬇	Display A2 trip level. E.g. **h3:40⬆**
➡	Display next head (channel).
⬅	Display previous head (channel).
➡ + ⬅	Hold / release current channel. (Press both push buttons at same time.)
R	Acknowledge / reset alarm

Input module terminals

DC INPUT 1 — 0 V / 24V

DC INPUT 2 — 0 V / 24V

RS-485 OUTPUT — B / A

24V / CH1 / 0 V — 4-20mA INPUT 1

24V / CH2 / 0 V — 4-20mA INPUT 2

24V / CH3 / 0 V — 4-20mA INPUT 3

24V / CH4 / 0 V — 4-20mA INPUT 4

24V / CH5 / 0 V — 4-20mA INPUT 5

24V / CH6 / 0 V — 4-20mA INPUT 6

24V / CH7 / 0 V — 4-20mA INPUT 7

24V / CH8 / 0 V — 4-20mA INPUT 8

Operational faults

An operational fault is a failure in operation of either the display card or input module. Operational faults are either

- **critical –** card may stop working, or
- **advisory** – card will continue to work safely, but its functions may be limited

When an operational fault occurs:

- Power LED flashes once a second
- If fault is critical, fault relay alternately energises and de-energises at 1Hz
- Display shows **fault code** alternately with normal display

Press **R** to clear the fault. If fault will not clear, or recurs, call DraegerService.

Operational fault codes

Fault code	Meaning	Remedy
FAULT BR FAULT B⬆ FAULT B⬇ FAULT B⬅ FAULT B➡	Push button fault. **Advisory**. Push button indicated appears to be continuously pressed.	Check push buttons.
FAULT C	Communications error – Regard. **Critical**. Communication with the master card has failed. Gas level display continues and alarm relays will continue to operate, but functions controlled by master card may not operate.	Check RS-485 connection between master card and display card.
FAULT CM	Communications error – module. **Critical**. Communication between display card and input module has failed. No gas level measurements are available.	Check RS-485 connection to input module.
FAULT D	Data error. **Critical**. Configuration settings have been corrupted. Default configuration settings will be used.	Check configuration settings.
FAULT E	EEPROM failure. **Critical**. Configuration data has been lost. Default configuration settings will be used.	Replace card.
FAULT H	Supply voltage too high. **Critical**.	Reduce supply voltage.
FAULT L	Supply voltage too low. **Critical**.	Increase supply voltage.
FAULT M	Microcontroller failure. **Critical**. Display card or input module has stopped working.	Hold down **R** to reset the card.
FAULT RR	Remote reset fault. **Advisory**. Remote reset terminals appear to be continuously shorted. The remote reset input will be ignored.	Check connections to remote reset input.
FAULT Wi FAULT We	Watchdog reset. **Advisory**. Unknown error caused card to reset. Card will continue to operate normally.	Check installation.

INSTALLATION

Install input module

Fit input module on 35mm symmetric or 32mm asymmetric DIN rail.

EMC!   Install the input module and display card in an enclosure that gives protection against electromagnetic interference.

Handle circuit boards with care during installation. Do not touch the circuit board or components. Take anti-static precautions were necessary.

Connect RS-485 output to display card

Connect RS-485 output of input module to screw terminals on Regard rack corresponding to position of 8-channel display card.

- Use twisted-pair cable

- Maximum length of connection is 1 km.

- Ensure that 0V potential between input module and display card is less than ±5V. Use RS-485 isolator(s) if necessary.

Do not connect the RS-485 output of the module to the terminals for a single-channel 4-20 card or Ex card, or a HART card: this will damage the module.
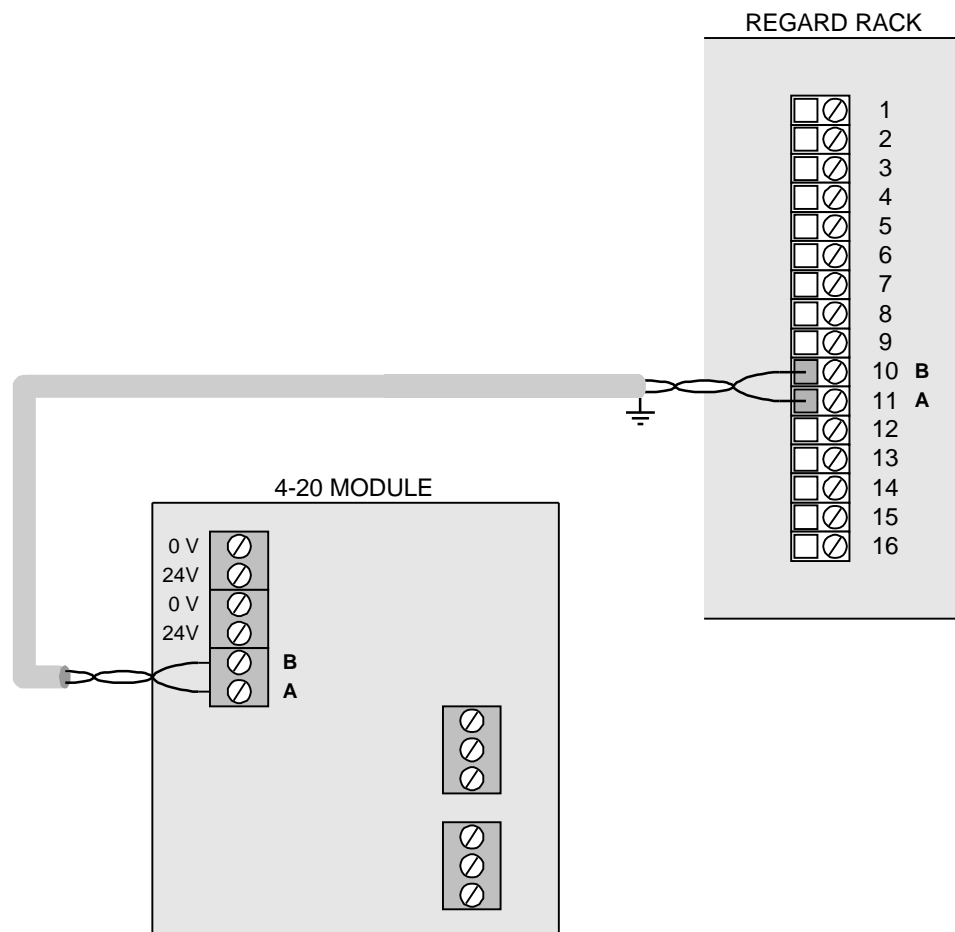
EMC!   If cable between module and display card is routed outside enclosure:

- Use screened twisted-pair cable

- Pass the cable through a ferrite tube between the cable entry and the input module, and between the cable entry and the display card

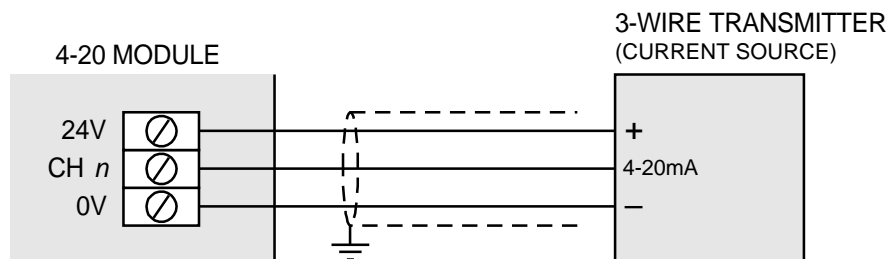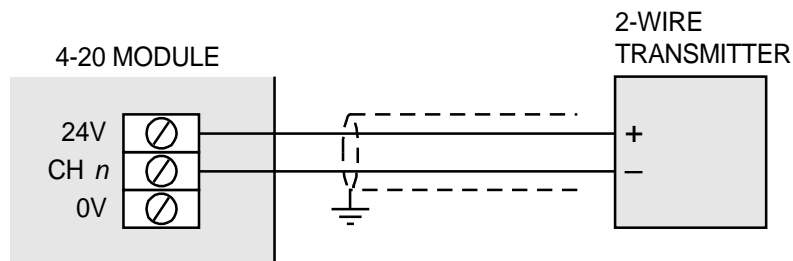- Keep distance between cable gland and ferrite tube short.

Position of ferrite tube for input module:
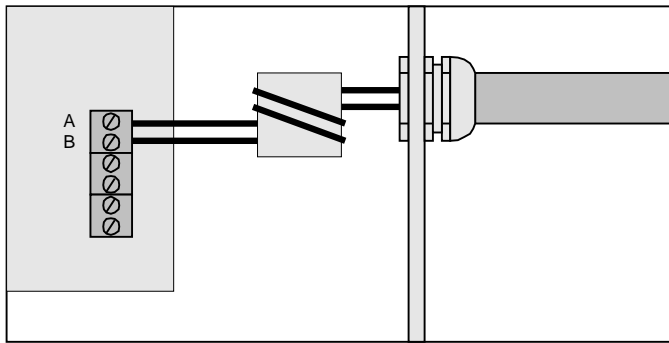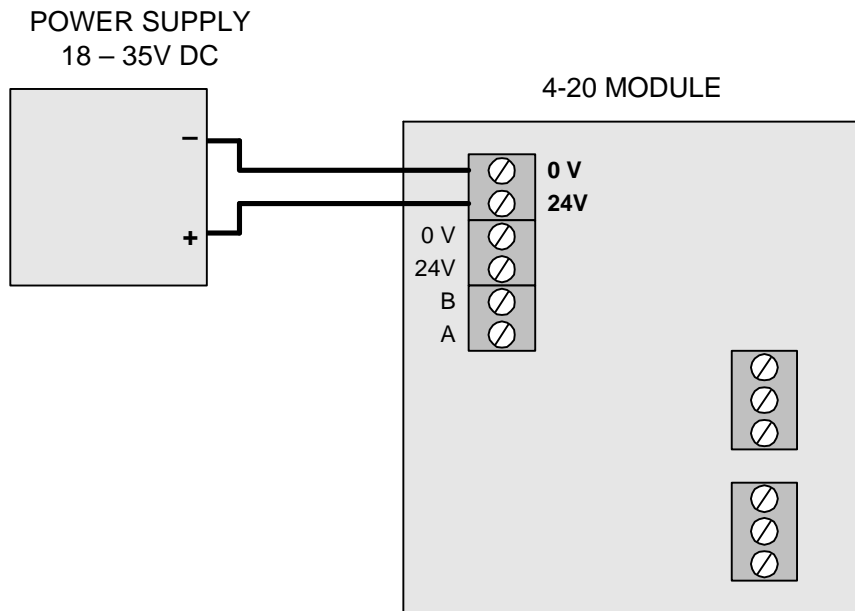

Connect transmitters to input module

Refer to transmitter installation instructions.

EMC!   Use screened cable to connect transmitters. Connect cable screen to earth where it enters the enclosure that contains the input module.

Connect DC supply to module

Connect DC supply to DC input 1 or 2.

Other input can be used to connect DC supply another module. Maximum current allowed through input terminals: 1A

Ensure that the 0V potential between input module and display card is less than ±5V. If potential difference exceeds 5V, use RS-485 isolator between input module and card.
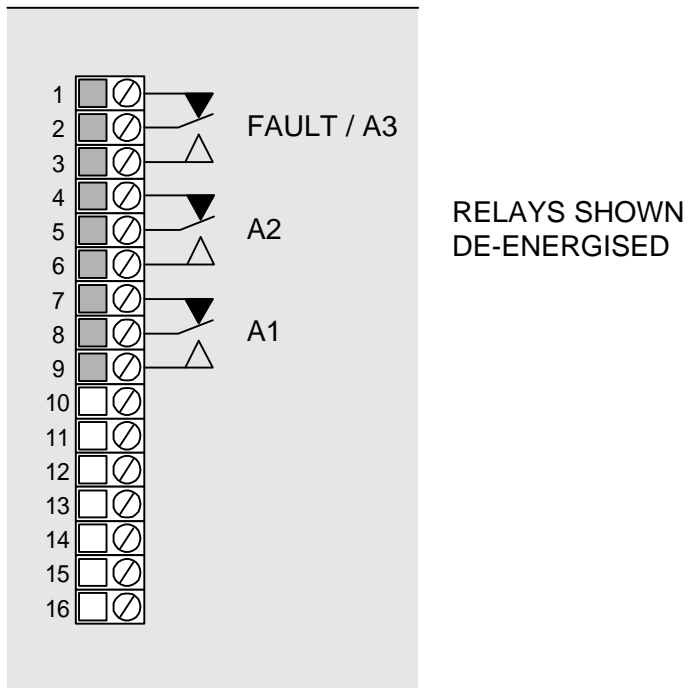
Install 8-channel display card

Insert 8-channel display card into slot in Regard rack wired to 8-input module.

EMC!   Tighten the screws on the front panel fully.

Optional connections

A1, A2, Fault/A3 alarm relays

If required, connect using screw terminals on Regard rack.

```
  1  □⊘  ▼
  2  □⊘      FAULT / A3
  3  □⊘  △
  4  □⊘  ▼
  5  □⊘      A2
  6  □⊘  △
  7  □⊘  ▼
  8  □⊘      A1
  9  □⊘  △
 10  □⊘
 11  □⊘
 12  □⊘
 13  □⊘
 14  □⊘
 15  □⊘
 16  □⊘
```

RELAYS SHOWN
DE-ENERGISED

Remote reset

If required, connect normally-open contact to 8-channel display card, to remotely acknowledge or reset alarms. Connect using screw terminals on Regard rack.

EMC!   Use screened cable.

REGARD RACK

```
 □⊘  1
 □⊘  2
 □⊘  3
 □⊘  4
 □⊘  5
 □⊘  6
 □⊘  7
 □⊘  8
 □⊘  9
 □⊘  10
 □⊘  11
 □⊘  12
 □⊘  13
 □⊘  14
 □⊘  15
 □⊘  16
```
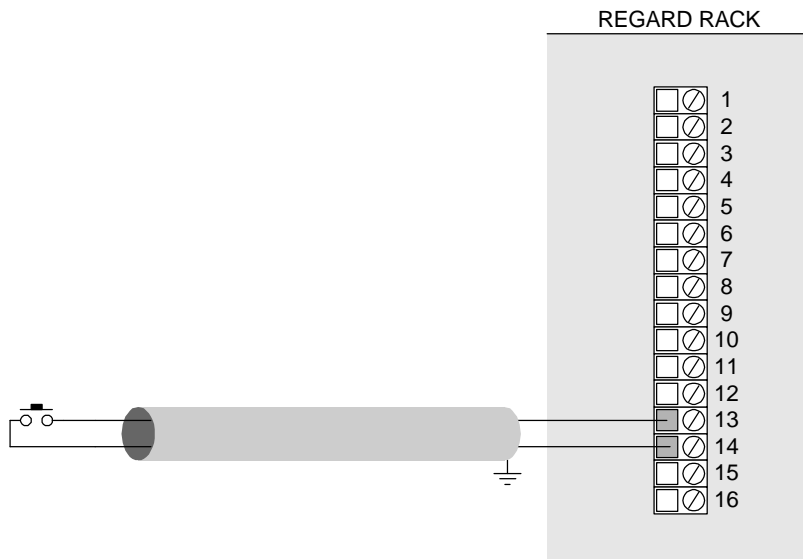
CONFIGURATION

Command mode

Configuration and maintenance of the display card is performed using front panel controls and display, by setting the card into **command mode**.

In command mode:

- Gas levels are no longer displayed.

- Operation of the alarm relays is prevented ("inhibited"). Inhibit LED on front panel of card is lit to indicate this.

- Transfer of alarm status information to the Regard master card (if present) is prevented.

- A1, A2, A3 and Fault LEDs do not flash.

Function of front panel controls in command mode

Key	Function
R	Confirm entry or selection
⬆	Select next command or option Increase displayed value
⬇	Select previous command or option Decrease displayed value
➡	Select next head
⬅	Select previous head

EXAMPLE

- Commands that allow a setting to be made for each head show the head number after the command number, e.g. command **04–0**

  04–0:h1

- Whenever head number (e.g. **h1**) is shown, press ⬅ or ➡ to select a different head number, e.g. head 2

  04–0:h2

  Display may show Regard channel number in place of head number, if card is set to display channel numbers (command 60-2).
  E.g.

  04–0:22

- Press **R** to select head shown. Display shows command name …

  GAS NAME

  … and then shows current setting for that head, e.g.

  h2:H2S

- Head number is shown before the setting.
  Different head number can be chosen by pressing ⬅ or ➡…

  h3:CO2

  …or, if card is set to display channel numbers:

  22:CO2

Accessing command mode

Access to commands is password protected. Passwords allow access to maintenance commands and configuration commands. Without entry of a password, some configuration settings can be examined, but not changed.

DISPLAY

- Press the **R** push button for 5 seconds, until the display shows: **00–0**

    Software version is shown briefly, e.g.:   **v2.5**

- Press ⬆ or ⬇ to select command number.

Entering a password

		PRESS	DISPLAY
•	Select command **00–1**	⬆ ⬇ R	**PASSWORD**
	Waiting for entry of password, first character flashing		**????**
•	Select first character of password. e.g. C	⬆ ⬇	**C???**
•	Confirm first letter. *Second character flashes.*	R	**CC??**
•	Select and confirm remaining characters	⬆ ⬇ R	**CCCC**
	Display shows access level, and exits command		**CONFIG**
			00–1

Factory setting of passwords:
- Configuration level: **CCCC**
- Maintenance level: **MMMM**

Saving configuration settings

Settings changed in command mode are lost unless saved.

		PRESS	DISPLAY
•	Select command **00–2**	⬆ ⬇ R	**SAVE**
	Asking for confirmation to save settings		**SAVE:NO**
•	Choose YES to save settings	⬆ ⬇	**SAVE:YES**
•	Confirm action	R	**WAIT**
			SAVED:OK
			00–2

Locking card in command mode

Display card automatically exits command mode if no buttons are pressed for 10 minutes. To prevent card from automatically exiting command mode, use command 60–0.

		PRESS	DISPLAY
• Select command **60–0**		⬆ ⬇ R	CMD LOCK
			NO
• Select YES to lock in command mode		⬆ ⬇	YES
• Confirm selection and exit command		R	LOCKED
			60–0

Table of commands

(See next page.)

Key:

- Command available at this level, and setting can be changed
- o Command available at this level, but setting cannot be changed

Cmd. No.	Command Name	Function	Command mode level			Default Setting
			Read	Maint.	Config.	
00–0	CMD QUIT	Quit command mode	●	●	●	
00–1	PASSWORD	Enter password	●	●	●	
00–2	SAVE	Save settings		●	●	
00–3	CHG P.WD	Change password		●	●	
04–0	GAS NAME	Set gas name	○	○	●	CH4
04–1	UNITS	Set gas units	○	○	●	%LEL
04–2	FSD	Set FSD (range)	○	○	●	100
04–3	FSD LOCK	Set over-range latching		○	●	YES
04–4	A1 ENER.	Set relays normally energised or		○	●	ON ALARM
04–5	A2 ENER.	energise on alarm		○	●	ON ALARM
04–6	F(A3) ENER.			○	●	NORMALLY
10-0	SET ZERO	Set zero		○	●	
10-1	SET SPAN	Set span		○	●	
10–2	DRIFT	Set zero drift band			●	0.0%
10–7	FLT U/R	Set under-range fault level	○	○	●	2.0
10–8	FLT O/R	Set over-range fault level	○	○	●	OFF
11–0	HYST	Set alarm hysteresis			●	1.0%
11–1	A1 TRIP	Set A1 alarm level	○	○	●	20
11–2	A2 TRIP	Set A2 alarm level	○	○	●	40
11–3	A3 TRIP	Set A3 alarm level (if gas alarm)	○	○	●	FAULT
11–4	A1 MODE	Set A1 rising/falling	○	○	●	RISE
11–5	A2 MODE	Set A2 rising/falling	○	○	●	RISE
11–6	A3 MODE	Set A3 rising/falling/fault	○	○	●	FAULT
11–7	A1 LATCH	Set relays latching, non-latching,		○	●	DNAK
11–8	A2 LATCH	delay-latching, acknowledgeable,		○	●	DNAK
11–9	F(A3) LATCH	non-acknowledgeable		○	●	LACK
14–0	LED TEST	Test display & LEDs	●	●	●	
14–1	RMT TEST	Test remote reset	●	●	●	
14–4	A1 TEST	Test A1 relay		●	●	
14–5	A2 TEST	Test A2 relay		●	●	
14–6	F(A3) TEST	Test Fault/A3 relay		●	●	
14–8	TEST MOD	Test input module communications		●	●	
52–0	HEADs	Set number of heads	○	○	●	h1 – h8
52–1	CARDs	Set channel numbers	○	○	●	Ch0
52–4	USER	Set user definable text			●	????
52–6	CHECKSUM	Set communications checksum	○	○	●	CRC
60–0	CMD LOCK	Lock card in command mode		●	●	NO
60–1	DISPLAY	Gas level display on / off			●	ON
60–2	LEDs	Set function of LEDs	○	○	●	COMMON
60–3	HEAD NUM	Display head or channel number	○	○	●	HEAD h_
60–4	A1 DIS.	Disable A1 relay		●	●	NO
60–5	A2 DIS.	Disable A2 relay		●	●	NO
60–6	F(A3) DIS.	Disable Fault/A3 relay		●	●	NO

Basic configuration

Set number of heads connected to module

Set the number of heads connected to input module.

	PRESS	DISPLAY
• Select command **52–0**	⬆ ⬇ R	**HEADs**
Display shows current setting: e.g.		**h1–h8**
• Select number of heads, e.g. 3	⬆ ⬇	**h1–h3**
• Confirm selection and exit command	R	**52–0**

Set gas name

	PRESS	DISPLAY
• Select command **04–0**	⬆ ⬇ R	**GAS NAME**
Display shows current setting of head 1: e.g. H2S		**h1:H2S**
• Select gas name for head 1, e.g. SO2	⬆ ⬇	**h1:SO2**
• Select next head. *Current setting shown.*	⬅ ➡	**h2:CH4**
• Select gas name for head 2, e.g. CO2	⬆ ⬇	**h2:CO2**
Repeat for other heads		
• Confirm selection and exit command	R	**04–0**

Set gas units

	PRESS	DISPLAY
• Select command **04–1**	⬆ ⬇ R	**UNITS**
Display shows current setting of head 1: e.g.		**h1:%LEL**
• Select head to change. *Current setting shown.*	⬅ ➡	**h2:%LEL**
• Select gas units for head, e.g. PPM	⬆ ⬇	**h2:PPM**
• Select next head to change.	⬅ ➡	**h3:%LEL**
Repeat for other heads		
• Confirm settings and exit command	R	**04–1**

Set measurement range (FSD)

		PRESS	DISPLAY
•	Select command **04–2**	↑ ↓ R	**FSD**
	Display shows current setting of head 1: e.g.		**h1:100**
•	Select head to change. *Current setting shown.*	← →	**h2:%LEL**
•	Select FSD for head, e.g. 50	↑ ↓	**h2:50**
	New FSD confirmed		**NEW FSD**
•	Select next head to change. *Current setting shown.*	← →	**h3:100**
	Repeat for other heads		
•	Confirm selection and exit command	R	**04–2**

Set alarm trip levels

		PRESS	DISPLAY
•	Select command **11–1**	↑ ↓ R	**A1 TRIP**
	Display shows current trip level of A1 alarm for head 1:		**h1:20**
•	Select head to change. *Current setting shown.*	← →	**h2:50**
•	Select trip level for head, e.g. 25	↑ ↓	**h2:25**
•	Select next head to change. *Current setting shown.*	← →	**h3:20**
	Repeat for other heads		
•	Confirm selection and exit command	R	**11–1**

Command **11–2** sets alarm trip level for A2.

Command **11–3** sets alarm trip level for A3 alarm, only when setting of command **11–6** is **A3**

•	For command 11–3 only, current setting may show:	**h2:FAULT**

Indicates that Fault / A3 relay is configured as a Fault alarm.

• Use command 11–6 to change Fault / A3 alarm to A3 alarm, if
  necessary.

Set rising or falling alarms (and select Fault or A3 alarm)

Commands 11–4, 11–5 and 11–6 set the mode of operation of the A1, A2 and Fault / A3 relays.
- For A1 and A2 alarms: rising alarm or falling alarm.
- For Fault / A3 alarm: rising A3 alarm, falling A3 alarm or Fault alarm

Commands 11–4 and 11–5

		PRESS	DISPLAY
• Select command **11–4 (11–5)**		⬆ ⬇ R	**A1 MODE**
Display shows current mode of A1 (A2) for head 1:			**h1:RISE**
• Select head to change. *Current setting shown.*		⬅ ➡	**h2:RISE**

Select **RISE** for rising alarm
Select **FALL** for falling alarm

• Select next head to change. *Current setting shown.*		⬅ ➡	**h3:RISE**

Repeat for other heads

• Confirm selection and exit command		R	**11–4**

Command 11–6

		PRESS	DISPLAY
• Select command **11–6**		⬆ ⬇ R	**A3 MODE**
Display shows current mode of A3 alarm for head 1:			**h1:FAULT**

FAULT : fault alarm
RISE : rising A3 alarm
FALL : falling A3 alarm

• Select head to change. *Current setting shown.*		⬅ ➡	**h2:FAULT**

Repeat for other heads

• Confirm selection and exit command		R	**11–6**

If the A3 mode on ANY head is set to RISE or FALL, the Fault / A3 relay is activated by A3 alarms only.

Set alarm latch mode

Commands 11–7, 11–8 and 11–9 set the latch mode of the A1, A2 and Fault / A3 relays.

	PRESS	DISPLAY
• Select command **11–7**	⬆ ⬇ R	**A1 MODE**
Display shows current mode of A1 alarm for head 1:		**h1:DNAK**
• Select head to change. *Current setting shown.*	⬅ ➡	**h2:DNAK**

Select **DNAK** for delay-latching
Select **ACK** for non-latching, acknowledgeable
Select **LACK** for latching, acknowledgeable
Select **NAK** for non-latching, non-acknowledgeable
Select **LNAK** for latching, non-acknowledgeable

• Select next head to change. *Current setting shown.*	⬅ ➡	**h3:RISE**
Repeat for other heads		
• Confirm selection and exit command	R	**11–7**

Commands 11–8 and 11–9 are identical.

Set zero

	PRESS	DISPLAY
• Select command **10–0**	⬆ ⬇ R	**SET ZERO**
Display shows reading of head 1: e.g.		**h1:2**
• Select required head. *Current reading shown.*	⬅ ➡	**h2:–3**
• Set display to zero	⬆ ⬇	**h2:0**
• Select next required head	⬅ ➡	**h3:–2**
• Confirm setting. Command exits	R	**10–0:h2**

Troubleshooting

Cannot set display to zero:
• Limit of adjustment range reached. Check output of transmitter is 4.0mA and re-calibrate if necessary.

Set span

	PRESS	DISPLAY
• Select command **10–1**	⬆ ⬇ R	**SET SPAN**
Display shows reading of head 1: e.g.		**h1:2**
Apply gas to measuring head, or manually set output of transmitter, e.g. to 12mA.		
• Select required head. *Reading shown.*	⬅ ➡	**h2:48**
• Set display to appropriate reading, e.g. 50	⬆ ⬇	**h2:50**
• Repeat for other heads	⬅ ➡	**h3:–2**
• Confirm setting. Command exits	R	**10–1:h2**

Save configuration settings

	PRESS	DISPLAY
• Select command **00–2**	⬆ ⬇ R	**SAVE**
Asking for confirmation to save settings		**SAVE:NO**
If no settings have been changed, display shows:		**SAVE:NO!**
• Select YES	⬆ ⬇	**SAVE:YES**
• Confirm action…	R	**WAIT**
…confirmation that settings have been saved…		**SAVED:OK**
…command exits		**00–2**

Advanced configuration

Set Regard channel numbers

For communication with a Regard master card, set the channel number for each head (transmitter).

- Channel numbers on a **display card** need not be consecutive (but channel numbers for the Regard **system** must be contiguous).

- Heads with channel number 0 do not communicate with the master card.

	PRESS	DISPLAY
• Select command **52–1**	⬆ ⬇ R	**CARDs**
Display shows current setting of head 1: e.g. channel 0		**h1:Ch0**
• Select channel number of head 1, e.g. 9	⬆ ⬇	**h1:Ch9**
• Select next head. *Current channel setting shown. e.g.*	⬅ ➡	**h2:Ch0**
• Select channel number of head 2, e.g. 12	⬆ ⬇	**h2:Ch12**
Repeat for other heads		
• Confirm selection and exit command	R	**52–1**

Set Regard communications checksum

	PRESS	DISPLAY
• Select command **52–6**	⬆ ⬇ R	**CHECKSUM**
Current setting, e.g.		**CRC**
• Select error-checking method: e.g. CSUM	⬆ ⬇	**CSUM**
Use CRC whenever possible. All cards in Regard system must use same setting.		
• Confirm selection and exit command	R	**52–6**

Set over-range latch

	PRESS	DISPLAY
• Select command **04–3**	⬆ ⬇ R	**FSD LOCK**
Display shows current setting of head 1: e.g.		**h1:YES**
• Select head to change. *Current setting shown.*	⬆ ⬇	**h2:YES**
• Select setting for head, e.g. NO	⬆ ⬇	**h2:NO**
• Select next head to change. *Current setting shown.*	⬅ ➡	**h3:YES**
Repeat for other heads		
• Confirm selection and exit command	R	**04–3**

Set relay energise state

Set each alarm relay on the display card to normally energised or energise on alarm.

Command **04–4** (set A1 relay energise mode) is described here: commands **04–5** (A2 relay) and **04–6** (Fault / A3 relay) are identical in operation.

	PRESS	DISPLAY
• Select command **04–4**	⬆ ⬇ R	**A1 ENER.**
Display shows current setting of A1 relay: e.g.		**ON ALARM**

Select **NORMALLY** for relay normally energised.
Select **ON ALARM** for relay energise on alarm.

DISABLED indicates that relay is disabled
(see commands 60–4, 60–5, 60–6)

	PRESS	DISPLAY
• Select setting for A1 relay, e.g. normally energised	⬆ ⬇	**NORMALLY**
• Confirm selection and exit command	R	**04–4**

Set alarm hysteresis

	PRESS	DISPLAY
• Select command **11–0**	⬆ ⬇ R	**HYST**
Display shows current setting of head 1: e.g.		**h1:1.0%**
• Select head to change. *Current setting shown.*	⬅ ➡	**h2:1.0%**
• Select setting for head, e.g. 1.5%	⬆ ⬇	**h2:1.5%**
• Select next head to change. *Current setting shown.*	⬅ ➡	**h3:1.0%**
Repeat for other heads		
• Confirm selection and exit command	R	**11–0**

Set user-definable text

User-definable text can be used to enter non-standard gas name **or** measurement unit.
Text entered is used when USER setting is chosen in command 04–0 or 04–1.

	PRESS	DISPLAY
• Select command **52–4**	⬆ ⬇ R	**USER**
Waiting for text entry: first character flashing		**????**
• Enter text. e.g. mg/l	⬆ ⬇ R	**mg/l**
(Press ⬅ or ➡ to select next or previous character)		
• Select next / previous head	⬅ ➡	**52–4:h2**
• Confirm selection and exit command	R	**52–4**

Gas level display on / off

Normal display of gas level can be disabled for any head, if required.

	PRESS	DISPLAY
• Select command **60–1**	⬆ ⬇ R	**DISPLAY**
• Select **ON** for normal display, or **OFF** to disable display of gas level	⬆ ⬇	**h1:ON**
• Confirm selection and exit command	R	**60–1:h1**

Set LEDs to display master alarms or per head alarms

A1, A2 and A3 LEDs may indicate alarm status of each head **or** the common status of all active heads.

	PRESS	DISPLAY
• Select command **60–2**	⬆ ⬇ R	**LEDs**
Display shows current setting, e.g.		**COMMON**

COMMON : LEDs indicate alarms for all heads
EACH I/P : LEDs indicate alarms for head currently
                  displayed

• Select setting required, e.g.	⬆ ⬇	**EACH I/P**
• Confirm selection and exit command	R	**60–2**

Display head number or channel number

	PRESS	DISPLAY
• Select command **60–3**	⬆ ⬇ R	**HEAD NUM**
Display shows current setting, e.g.		**HEAD h _**

CHAN _ _ : Display channel number.
HEAD h _ : Display head number.

• Select setting required, e.g. display channel number	⬆ ⬇	**CHAN _ _**
• Confirm selection and exit command	R	**60–3**

Note: the head number is still displayed if no channel number has been set for that head (i.e. channel number is 0).

MAINTENANCE

Recommended maintenance intervals

Daily:
- Visual check for readiness for operation

At regular intervals:
- Check connections from heads (transmitters) to signal inputs and between input module and display card
- Test LEDs and alarm relays
- If connected, test remote reset
- Check communications between display card and module

Commands for system maintenance

Test LEDs and display

		PRESS	DISPLAY
•	Select command **14–0**	⬆ ⬇ R	**LED TEST**
	All LEDs and display segments flash.		
•	Stop test	R	**14–0**

Test remote reset

		PRESS	DISPLAY
•	Select command **14–1**	⬆ ⬇ R	**RMT TEST**
	Display shows status of remote reset input:		**OPEN**
	OPEN : circuit open		
	CLOSED : circuit closed		
•	End test	R	**14–1**

Test alarm relays

The A1, A2 and Fault/A3 relays can be operated manually, to test alarms.

Command **14–4** (test A1 relay) is described here: commands **14–5** (test A2 relay) and **14–6** (test Fault/A3 relay) are identical.

		PRESS	DISPLAY
•	Select command **14–4**	⬆ ⬇ R	**A1 TEST**
	Display shows status of relay: e.g.		**A1: ON**
	ON : relay energised		
	OFF : relay de-energised		
•	Change state of relay	⬆ ⬇	**A1: OFF**
•	End test	R	**14–4**

Test communications with 8-input module

		PRESS	DISPLAY
•	Select command **14–8**	↑ ↓ R	**TEST MOD**
	Display shows number of data packets received		**123**
•	To reset count to zero:	↑ ↓	**0**
•	End test	R	**14–8**

Disable alarm relays

The A1, A2 and Fault(A3) alarm relays can be disabled, to prevent alarms being activated during maintenance. When disabled, the relay will always stay in its non-alarm state.

Command **60–4** (disable A1 relay) is described here: commands **60–5** (disable A2 relay) and **60–6** (disable Fault / A3 relay) are identical in operation.

		PRESS	DISPLAY
•	Select command **60–4**	↑ ↓ R	**A1 DIS.**
			NO
•	Select YES to disable relay	↑ ↓	**YES**
•	Confirm selection and exit command	R	**DISABLED**
			60–4

Inhibit LED blinks to indicate that one or more relays are disabled.

Warning: a disabled relay will not indicate a gas alarm or fault alarm.

TECHNICAL DATA

Display card

Supply voltage	18 to 35V DC
Environmental operating ranges • Temperature • Humidity • Vibration	 –20° to +50°C 0 to 90%RH, non-condensing To BS 2011 Part 2.1Fc
Current consumption • Typical • Maximum	 50mA 200mA
Relays • Type • Switching capacity • Max. switching power • Max. switching voltage • Min. switching voltage & current	 Single pole double throw (1 Form C) 5A, 250VAC; 5A 30VDC 1,250VA, 150W 250VAC, 100VDC 12V, 100mA
Format	Single Eurocard, 10 HP front panel
Dimensions	187 x 129 x 50mm
Fuse	800mA quick blow (F), 20 x 5mm

Input module

Supply voltage	18 to 35V DC
Environmental operating ranges • Temperature • Humidity • Vibration	 –20° to +50°C 0 to 90%RH, non-condensing To BS 2011 Part2.1Fc
Current consumption (excluding transmitters)	50mA
Max. supply to each transmitter	0.5A
Wire cross-section • Transmitter inputs • DC inputs & RS-485	 2.5 mm^2 1.5 mm^2
4-20mA input range	0.5 – 22mA
Dimensions	210 x 90 x 60mm
Fuses • Module supply (Fuse 1) • Transmitters supply (Fuse 2)	 200mA quick blow (F) 20 x 5mm 4A slow blow (T) 20 x 5mm

Part numbers

Description	Part Number
Regard 8-channel display card	4206078
Regard 8-input 4-20mA module	4206079