16 K-Chief 700

16.29.02 Stahl

Ref:
Document name: Operating instructions for the I.S. 1 System
Document nr:

DMS no: 1088910A

Objectives

To be familiar with:

- Interface to K-Chief 700 system
- Stahl component layout and specification
- Stahl system layout and specification
- Loop typicals for Stahl RIO units

Ex RIO concept

OS

FS

Safe area

RCU

Profibus

Stahl CPM

Stahl RIO

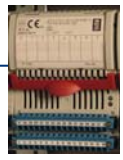
Hazardous area

Ex RIO Concept

X1

Isolator/barrier

Profibus



CPM

Remote IS units

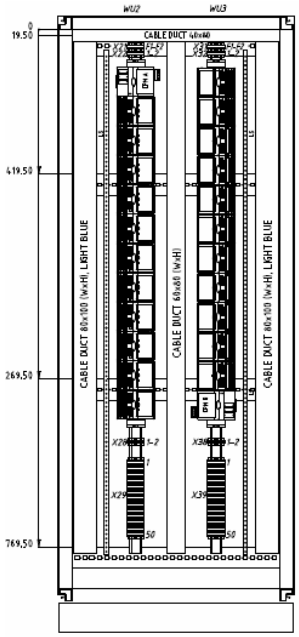
Stahl I.S. cabinet

Cabinet overview

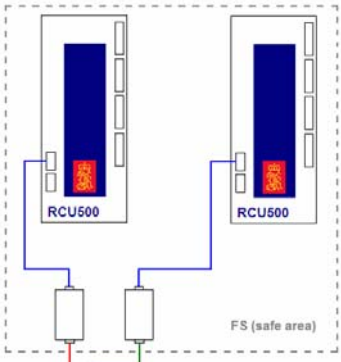
- CPU & Power Module (zone 1)
- RIO modules with field termination
- Single or redundant CPM

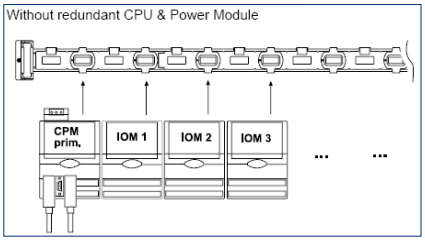
Stahl in FS

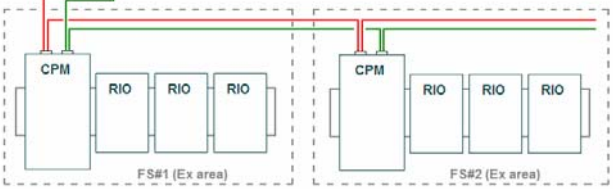
CPM and RIO modules



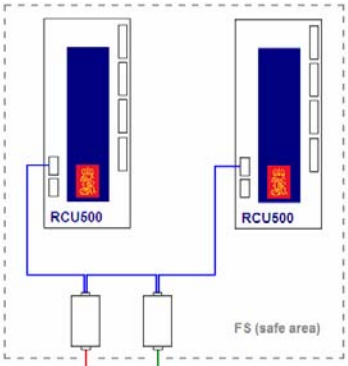
Single CPM

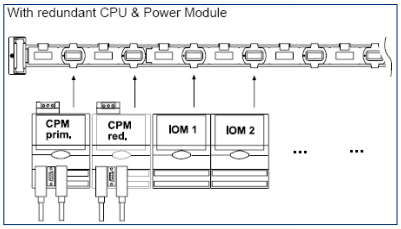


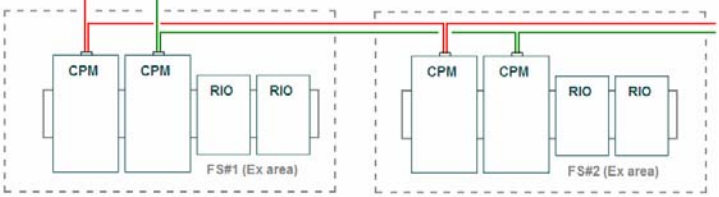




Redundant CPM



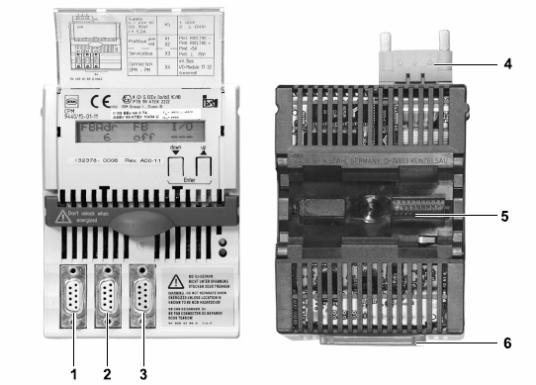




CPM Type 9440/15, zone 2

- CPU & Power Module for zone 2
- Fieldbus interface and power supply in a single module
- Integrated power supply for 16 I/O modules
- Installation in Zone 2 or in safe areas
- Power supply 24 V DC
- Galvanic isolation between fieldbus, power supply and internal data bus
- LCD indicator for local display of diagnostic data, input and output values
- Status LEDs for RUN and ERROR
- Field cable connection with standardized D-Sub 9 connectors

CPM Type 9440/15, zone 2



1 Fieldbus
2 Redundant fieldbus
3 ServiceBus
4 Power supply
5 BusRail plug
6 Data plug

CPM Type 9440/15, zone 2

1 Display: Displays fieldbus addresses, errors and module parameters

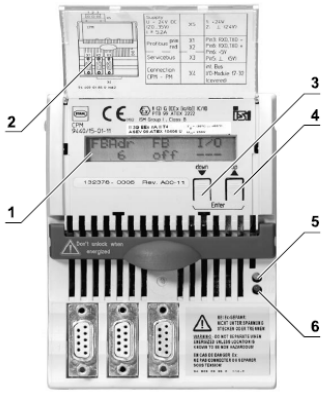
2 Label carrier: Contains the connector allocation plan

3 Input key (left): For settings (e.g. fieldbus address) and selection of displays (e.g. system status)

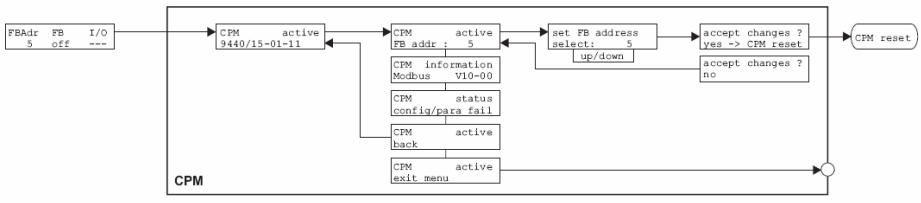
4 Input key (right): For settings (e.g. fieldbus address) and selection of displays (e.g. system status)

5 Green LED (RUN): Shows the correct function of the CPU & Power Module in normal operation

6 Red LED (ERROR): Shows an error in the CPU & Power Module or in one of the I/O modules



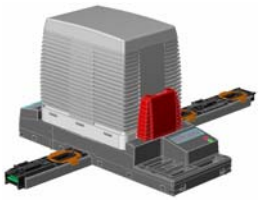
Address settings on CPM



Direction in Diagram	Button on CPM
↑	DOWN ▼
↓	UP ▲
→	▼ ▲ ENTER

CPM Type 9440/12 or 9440/22, zone 1

- Integrated power supply for up to 8 I/O modules
- Installation in zone 1
- Power supply 24 V DC
- Galvanic isolation between fieldbus, power supply and internal data bus
- LCD indicator for local display of diagnostic data, input and output values
- Status LEDs for RUN and ERROR
- Faults and alarm reporting:
  - CPM:
    - Hardware and configuration fault
  - IO modules:
    - No response from IO modules
    - Fault on internally bus (primary or redundant)
    - IO modules hardware fault
    - Dissimilar module configuration



Stahl RIO module

- Each RIO module is supplied with power from the CPM module
- 4, 8 or 16 channels
- Installation in Zone 1 or Zone 2
- Galvanic isolation between inputs and system
- Open-circuit and short-circuit monitoring foreach field circuit
- Status LEDs for RUN and ERROR
- Connection of the field cables with plug-in terminals
- Module can be hot swapped while powered up

Module identification

I/O modules for analog signals

Type	Description	Abbreviation	Channels	Typical application
9460/12-08-11	Analog input module 0/4-20 mA	AIM	8/4	• 2-wire transmitter • Active 0/4-20 mA signal • 4-wire transmitter
9461/12-08-11	Analog input module 4-20 mA HART	AIMH	8	• 2-wire transmitter with HART communication
9461/12-08-21	Analog input module 4-20 mA HART	AIMH	8	• 2-wire and 4-wire transmitters with HART communication
9480/12-08-11	Temperature Input Module R	TIMR	8	• Resistance thermometer (Pt 100, Pt 1000, etc.) • Remote potentiometer
9481/12-08-11	Temperature Input Module mV	TIMmV	8	• Thermocouples • mV sensor
9465/12-08-11	Analog Output Module 0/4-20 mA	AOM	8	• Positioner • I/P converter • Indicator
9466/12-08-11	Analog Output Module 0/4-20 mA HART	AOMH	8	• Positioner with HART communication

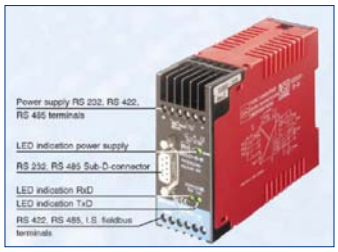
Module identification

I/O modules for digital signals

Type	Description	Abbreviation	Channels / Ex-protection	Typical application
9470/22-16-11	Digital Input Module NAMUR	DIM	16	• NAMUR proximity switch • Contact • Optocoupler
9471/10-16-11	Digital Input Module 24 V	DIM24V	16 without Ex-protection	• Contacts
9475/12-04-11	Digital Output Module 17 V; 11 V / 40 mA	DOM4	4	• Ex i solenoid valve • Ex i indicating lamp
9475/12-04-21	Digital Output Module 23 V; 12.5 V / 40 mA	DOM4	4	• Ex i solenoid valve • Ex i indicating lamp
9475/12-04-31	Digital Output Module 23 V; 10 V / 40 mA	DOM4	4	• Ex i solenoid valve • Ex i indicating lamp
9475/12-08-41	Digital Output Module 9.5 V; 4.5 V / 30 mA	DOM8	8	• Ex i solenoid valve • Ex i indicating lamp
9475/12-08-51	Digital Output Module 17 V; 13 V / 26 mA	DOM8	8	• Ex i solenoid valve • Ex i indicating lamp
9475/12-08-61	Digital Output Module 23 V; 17.5 V / 20 mA	DOM8	8	• Ex i solenoid valve • Ex i indicating lamp
9477/10-08-12	Digital Output Module Relay 1 contact normally open	DOMR	8 without Ex-protection	• Solenoid valves • Signal output

Stahl Fieldbus Isolating Repeater, Type 9185/9373

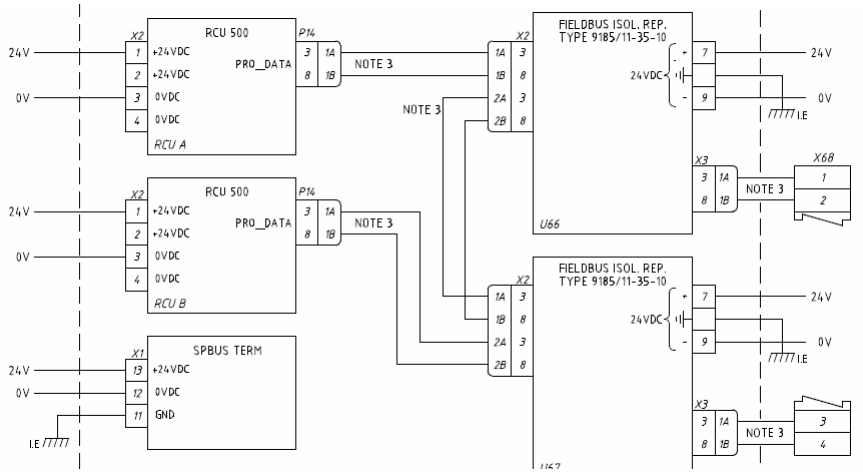
Basic function: Isolating repeater for communication signals



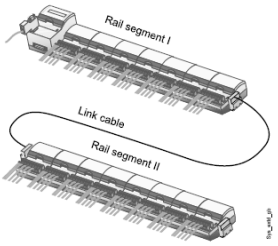
- Installation in non-Ex areas or in zone 2
- Interface to automation system RS 232, RS 422, RS 485
- Power supply 24 V AC/DC

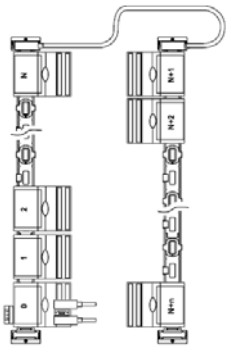
Solution with Fieldbus Isolation Repeater

Power and wiring



Bus rail

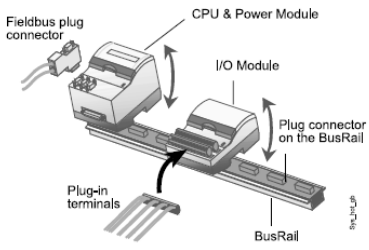




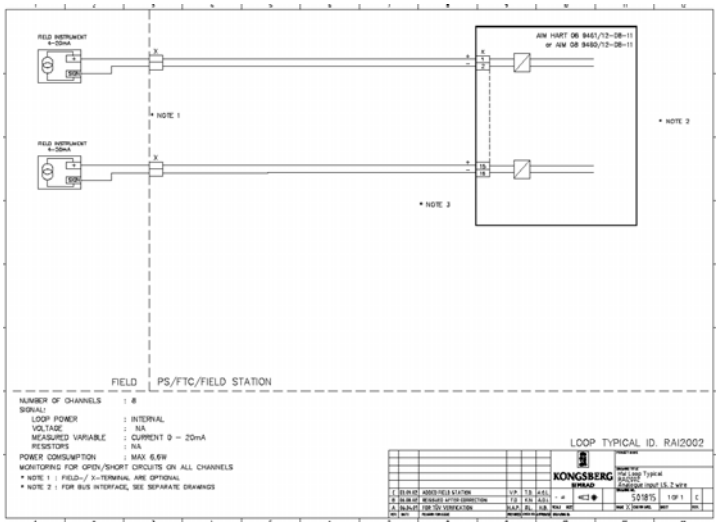
- Provides internal electrical connection between CPM and IO modules. Consists of internal data bus (redundant), power bus and address circuits for IO modules
- Solution for 2 - 18 RIO modules. Termination is required both at the beginning and at the end

Hot swap

- Hot swap - exchangeability of the modules during operation without requiring a new start-up
- All Stahl modules can be replaced at any time during operation. This also applies for the Zone 1 CPU & Power Modules
- The I/O modules are fitted with plug-in terminals for connection to the field cable so that the field wiring does not have to be disconnected when replacing a module



Loop typical RAI2002



Summary

- Stahl units provide an interface to Ex area
- CPM and RIO units are connected with the RCU using Profibus
- The system can be configured with both single and redundant CPM
- Two types of CPM units depending of Ex zone 1 or 2
- Address settings can be changed through the CPM menu
- The Stahl RIO modules comes in many versions, which offers different functionality
- Both CPM and RIO units can be "hot swapped"
- Specific loop typical for Stahl RIO modules