Honeywell Safety and Security Forum
Together, working towards a more safe and secure future

Safety Systems
Safety Manager Remote Universal Safe IO

Functional Overview
Safety Manager Universal Safe IO Specifications

- High density 32 channel redundant universal I/O module
  - Supports AI, AO, DI and DO signals on any channel
  - Universal two wire termination
  - Standard line monitoring
- TÜV SIL1, 2 and 3 certified
- Compatible with existing Safety Manager installations
  - Minimum hardware requirement is QPP-0002
  - Safety Manager R140 or greater
- Extreme temperature range
  - -40 to +70 degrees C,
  - -40 to +158 degrees F

One I/O module instead of 4 different module types
Safety Manager Universal Safe IO Features

• Line monitoring and short circuit detection on every channel
• Sequence of event support
• Channel definition through application programming
• On-line modification support
  – TÜV approved online modification technique
• Spare channel detection
• HART pass thru
  – FDM directly connected to USI
Remote Universal Safe Logic Solver

- Remote Universal module with logic solving capability (RUS-LS)
  - New module, based on:
    - 32 Universal channel concept
    - Function Logic Diagram execution
    - RUS-LS safety function unaffected during
      - Communication loss,
      - Safety Manager shutdown
Standard Solution: Field Device Units

- **FC-RUSFDU-01**
  - SM RUSIO system 32CH,
  - Steel,
  - Fiber 10Km,
  - ELD,
  - 0°C to +60°C (+32°F to +140°F)

- **FC-RUSFDU-02**
  - SM RUSIO system 32CH,
  - Stainless steel 316L,
  - Fiber 10Km,
  - -40°C to +70°C (-40°F to +158°F)
RUSIO Hardware: FC-MCAR-01

• Mounting Carrier type FC-MCAR-01
  – A carrier that can be screwed on any flat surface.
  – Does carry one IOTA-R24 assembly.
  – The MCAR-01 consists of:
    • a metal profile
    • a plastic cover plate
    • a ground rail with 16 ground connection screws
    • two power rails with M5 holes (+24V and 0V)
    • stacking option for multiple MCARs (per 3 ft)
    • four mounting holes (6.35 mm diameter)
RUSIO Hardware: FC-IOTA-R24

- Redundant I/O Termination Assembly type FC-IOTA-R24
  - Enables the use of a redundant set of modules.
  - The IOTA-R24 provides for:
    - Connectors for two (redundant) RUSIO-3224 modules.
    - 32 (universal) I/O channel connections (CN1 and CN2).
    - Two power switches to switch off the RUSIO modules.
    - Enable / Disable SM RUSIO ESD function for CH32.
    - 4 (identical) V+ connections (CN3), for active AI devices.
    - Two RJ45 connectors for RUSIO Link A and B.
    - Node Address jumper
    - 24V power connection screws to the carrier power rails.
RUSIO Hardware: FC-RUSIO-3224

- Remote Universal Safe I/O device type FC-RUSIO-3224
  - 32 universal safe I/O channels with configurable channel function
  - All channels are powered out of the 24Vdc supply.
  - Supports two (100Mbaud) RUSIO Links to communicate with a SM Controller.
  - Each channel can be configured as:
    - Digital input (with or without loop monitoring)
    - Digital output (with or without loop monitoring)
    - Analog input (0-20mA or 4-20mA active)
    - Analog output (0-20mA or 4-20mA active)
    - Smoke/Heat detector
• Earth Leakage Detector (ELD) type 10310/1/CC
  – Earth Leakage Detector for 24 Vdc systems.
  – It has a manually operated self-test feature and an earth connection monitor by means of a test switch
  – Standard DIN EN 35 rail mounted.
  – Supports two modes:
    • Normal operation
    • Test mode: to locate earth faults
  – Reset function:
    • Manually: switch on module
    • Remote: reset input 24 Vdc
RUSIO Hardware: FC-RUSPSU-R

- Redundant Power Supply assembly type FC-RUSPSU-R
  - A power supply assembly providing a redundant 25Vdc, 12 A
  - Power distribution embedded
  - Usable in SIL 3 applications.
Project Special Solution: Full Size Cabinet

- Standard Rittal TS8 Series
  - For SM RUSIO modules only (no swing frame)
  - Default 800x800x2000mm, Steel,
  - Front and rear access
  - Maximum 14 redundant SM RUSIO modules.
  - Standard power supplies type FC-PSU-UNI2450U
  - Fiber 100Km, ELD,
  - 0°C to +60°C (+32°F to +140°F)
Safety Manager Universal Safe IO Capacities

- Per Safety Manager:
  - 28 Universal Safe IO modules
    - Circa 900 remote IO channels
    - In addition to chassis based local IO
  - 1 SM RIO Link
    - Dedicated USI required
    - Dedicated redundant IO network
    - Maximum distance 100 Km
    - Embedded fiber optic support
  - 6 Switch layers
    - Honeywell certified switches

SIL 3 certified SM RIO Link
Safety Manager Remote Solutions

Geographically Distributed System Solutions
Geographically distributed safety solutions

1. Safety Manager with Distributed Safety Manager
   - SafeNet

2. Safety Manager with Safety Manager Remote Universal Safe IO
   - SM Remote I/O Link

3. Or a combination
Logical overview of a combined system
Traditional Field Wiring & Marshalling

Junction boxes

Junction box

Marshalling Cabinet

Safety Manager

DI
AI
DO
AO

DI
AI
DO
AO

DI
AI
DO
AO

Multi Core Cables

System Integration Cables
Soft Marshalling – Reinventing field wiring

Lowest Installed & Total Cost of Ownership

RIO Field Mounted

Junction box

Marshalling Cabinet

Safety Manager

Non Hazardous

Hazardous

DI
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DO
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Intrinsic Safe solutions

I.S. Solution

RUSIO FDU EX-d solution

Interfacing solutions to meet your requirements
Safety Manager FDU

• Small field mountable unit, available for indoor and outdoor deployment, available in:
  – Carbon steel enclosure
  – NEMA 4x enclosure

• SIL3 logic solver plus 32 channels (universal IO)

• Suitable for :
  – Standalone usage or
  – Integrated in Experion or
  – Third party DCS
New Remote Universal Safe IO features

• Non redundant IOTA
  – Software support of non-redundant RUSIO

• Low latency SOE with time stamping in RUSIO module, to assure highest possible accuracy (msec)

• All the SOE are collected in Safety Manager and available in the Experion SOE event log
Direct FDM to USI HART Pass Thru

• HART Pass Thru
  – Allow users to monitor and maintain HART field devices connected to RUS-IO and RUS-LS

• Direct connection to Field Device Manager - Honeywell’s field device maintenance tool

• Requires FDM release R430
Enhanced Experion integration

- Single point of data entry
- Seamless integration into the overall Experion topology
- Support Fault Tolerant Ethernet (FTE)
- Safety Builder will publish point information to Experion
- Support Experion native communication protocol
  - Provides peer-to-peer communication
  - Data access
  - Notifications
  - Console station support
Native Experion integration example

- Safety Builder FLD configuration

- Experion HMI references
  - 10XY450.ZSO.PV - Open limit switch Process value
  - 10XY450.ZAX.OP - Output to solenoid valve
Safety Manager in summary

- Scalable
- Safety from the inside out
- Efficiency, on line modifications
  - hardware,
  - software
  - application
- Low foot print
- Freedom to select: integrated, segregated or standalone topology
- Cyber secure
Thank you!

Any Questions?

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