

# SafetyNet Controller

## SafetyNet Controller

8851-LC-MT

- ♦ Certified for use in SIL 2 safety applications, according to IEC 61508
- ♦ Comprehensive internal diagnostics provide basis for safety architecture 1oo1D
- ♦ Optional redundancy with bumpless transfer for increased availability
- ♦ Dual redundant high speed fault tolerant Ethernet LAN
- ♦ Two connections to serial devices
- ♦ On-line configuration and re-configuration
- ♦ Communicates with up to 64 I/O modules
- ♦ Communicates on peer-to-peer basis with other SafetyNet and standard Controllers
- ♦ Can write to standard output modules without compromising safety function
- ♦ Live maintainable and hot-swappable - even in Class 1, Div 2 or Zone 2 hazardous areas
- ♦ HART pass-through of process and status variables
- ♦ Event logging up to 8000 events
- ♦ 12Vdc Controller power required from 8913-PS-AC

## CONTROLLER SPECIFICATION

See also System Specification

### LAN INTERFACE

**Transmission medium** .....100BaseTX or 10BaseT Ethernet™  
**Transmission protocol**.....SafetyNet P2P\*  
**Transmission rates** .....10 - 100 Mbits/s  
**LAN connector type (x2)** .....RJ 45 (8-pin)  
**LAN isolation (dielectric withstand)**.....1500 V  
**Action on software malfunction** .....Halt CPU / Reset CPU

\* SafetyNet P2P is a modified form of Modbus™ certified as suitable for use in SIL 2 safety related applications that require peer-to-peer communication.

### SERIAL INTERFACES (COM 1 & COM 2)

**Transmission rates**.....1.2 – 115.2 kbits/s (async.)  
**Transmission standard**.....RS485 half-duplex  
**COM 1 connector** (on carrier) .....9-pin D-type connector (F)  
**COM 2 connector** (on controller) .....9-pin D-type connector (M)

### HAZARDOUS AREA SPECIFICATION

**Protection Technique**.....EEx nL IIC T4  
**Location** (FM and CSA) .....Class 1, Div.2, Grps A,B,C,D T4



### POWER SUPPLIES

**Controller Power Voltage**.....12V dc (from 8913-PS-AC)  
**Controller Power Supply**.....0.4A (typical), 0.5A (max.)  
**System Power Supply**.....15mA (max.)

### MECHANICAL

**Module dimensions** .....69 (w) x 232 (l) x 138 (h) mm  
**Weight** (approx.).....1.35kg

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Modbus™ is a trademark of Schneider Automation Inc  
HART® is a registered trademark of the HART Communication Foundation

# System Specification

## System Specification

### ENVIRONMENTAL

#### Operating Ambient Temperature

Optimum orientation\* .....-40°C to +70°C

Non-optimum orientation.....-40°C to +50°C

**Storage** .....-40°C to +85°C

**Relative Humidity** .....5 to 95% (non-condensing)

**Ingress protection** .....IP20 to BS EN60529: 1992

**Corrosion resistance**.....Designed to meet ten year service in Class G3 corrosive environment, as per ISA S-71.04: 1985 "Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants".

\* With field terminals vertically above or below the IO Modules.

#### Operating vibration resistance

**DIN rail mounted\*** .....

.....1g (sinusoidal vibration 10 – 500Hz to EN 60068-2-6)

.....1g (random vibration 20 – 500Hz to BS2011: Part 2.1)

**Surface mounted** .....

.....5g (sinusoidal vibration 10 – 500Hz to EN 60068-2-6)

.....5g (random vibration 20 – 500Hz to BS2011: Part 2.1)

\* The ELFD Controller Carrier 8751-CA-NS can only be surface mounted.

#### Operating, Storage and Transportation vibration resistance

.....30g peak acceleration, with 11ms pulse width (EN 60068-2-27)

#### Storage and Transportation shock resistance

.....1m drop onto flat concrete (EN 60068-2-32)

### MECHANICAL

#### DIN-rail types

.....'Top hat', 35 x 7.5mm to EN 50022

.....'Top hat', 35 x 15 mm to EN 50022

.....G-section, to EN 50035

### ISOLATION

**Between SafetyNet channels** .....none

**Channel (any) to railbus** .....250V ac rms

### NODE SIZE LIMITATIONS

**Maximum physical length of railbus\*** .....6.8m

**Maximum number of extender cables** .....3

**Maximum number of IO Modules**.....64

**Maximum number of SafetyNet nodes** .....249

\* overall including backplanes and extender cables

### HAZARDOUS AREA APPROVAL

#### SafetyNet node location

.....Safe area or

.....Zone 2, IIC, T4 hazardous area

.....Class 1, Div 2, Groups A-D T4\* hazardous location

\* 8913-PS-AC and 8914-PS-AC power supplies T3C

#### Field equipment and wiring location

.....Safe area or

.....Zone 2, IIC hazardous area

.....Class 1, Div 2, Groups A-D hazardous location

(Temperature classification will be determined by the field apparatus)

#### Applicable hazardous area standards:

- ◆ Factory Mutual Research Co., 3611: 2004. "Non-incendive Electrical Equipment for use in Class I and II, Division 2, and Class III Divisions 1 and 2, Hazardous (Classified) Locations".
- ◆ CSA C22.2 No 213-M1987, Reaffirmed 2004. "Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations".
- ◆ EN 60079-0:2004 "Electrical apparatus for explosive gas atmospheres. Part 0: General Requirements".
- ◆ EN 60079-15: 2005 "Electrical apparatus for explosive gas atmospheres. Part 15: Construction, test and marking of type of protection 'n' electrical apparatus".

### ELECTRICAL STANDARDS AND APPROVALS

#### Applicable EMC standards

- ◆ EN 61326-1: 2005. "Electrical equipment for measurement, control and laboratory use – EMC requirements. Part 1: General requirements".

#### Applicable Electrical Safety standards

- ◆ IEC 61131-2: 2003. "Programmable controllers - Part 2: Equipment requirements and tests".

### SAFETY APPROVALS

#### Applicable Functional safety standards

- ◆ IEC 61508:2000. "Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems"
- ◆ IEC 61511:2004. "Functional Safety - Safety Instrumented Systems for the Process Sector".

### CABLE PARAMETERS FOR NON-INCENDIVE FIELD WIRING

| Module<br>(each channel) | FM        |                     |                     |
|--------------------------|-----------|---------------------|---------------------|
|                          | Gas Group | C <sub>a</sub> (µF) | L <sub>a</sub> (mH) |
| 8811-HI-TX               | A+B       | 0.17                | 11                  |
|                          | C         | 0.51                | 33                  |
|                          | D         | 1.36                | 88                  |