Honeywell

EXPERION PKS

RELEASE 100.1

Universal Marshalling solutions

Installation and User's Guide for Signal Conditioning Assembly (SCA)

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1 Introduction

The Universal Marshalling Solution delivers the next phase of Honeywell LEAP™, lean project implementation philosophy through standardization of marshalling design. Standardized (or universal) marshalling is achieved through central and distributed installations using standard cabinet configurations with signal conditioning assemblies.

Independence between I/O assignment and field wiring enables a flexible engineering schedule and eliminates unintentional access of I/O modules during maintenance. SCA enables the flexibility to combine a variety of field signals, while remaining separated from I/O modules and control system electronics. This unique feature means that SCA eliminates re-engineering and rewiring due to design changes.

Predesigned standard build cabinets reduce the complexities and reliance on non-standard third party solutions. The number of spares stocked and the amount of documentation required is reduced by eliminating multiple equipment configurations.

Honeywell serves as a single source vendor from instrumentation to control system.

This release of SCA includes pass through, disconnect, fusing, and relay functions.

1.1 About this user guide

The procedures in this guide are intended to give you the ability to perform installation, commissioning and maintenance activities of Signal Conditioning Assembly (SCA) with the Honeywell's Universal Marshalling solution.

1.2 Intended audience

This guide is intended for the following users:

- Persons responsible for system planning and marshalling hardware installation.
- Service persons responsible for routine maintenance of control and marshalling hardware, and who diagnose and repair faults.

1.3 Prerequisite

Basic knowledge of Industrial process automation and Honeywell's Experion control systems makes it easy to understand context and terminologies used in this document.

1.4 References

- Control Hardware Planning Guide – provides information related to planning and installation of Experion control hardware.
- Control Hardware Installation Guide - Provides an overview for the installation of Experion control hardware.

- Series C IO User's Guide – Describes Series C I/O hardware devices and configuration details.
- Signal Conditioning Assembly (SCA) HAZLOC Manual

1.5 Acronyms

Acronym	Expansion
SCA	Signal Conditioning Assembly
MTC	Mass Termination Cable
FTA	Field Termination Assembly
UPTA	Universal Pass Through Adapter
UDIR	Universal Digital Input Relay
UDOR	Universal Digital Output Relay
USCA	Universal Signal Conditioning Assembly
UAIA	Universal Analog Input Isolator Module
UGAI	Universal Analog Input Barrier Module
UAOA	Universal Analog Output Isolator Module
UGAO	Universal Analog Output Barrier Module
UDXA	Universal Digital IO isolator Module
UGDA	Universal Digital IO Barrier Module
UGIA	Universal Integrated FTA – IS
IOTA	Input Output Termination Assembly
I/O	Input and Output
IOM	Input Output Module
LLIA	Low Level Input Adapter
TC	Thermocouple
RTD	Resistance Temperature Detector
CJC	Cold Junction Compensation

2 Safety information

2.1 Safety Measures

SCA modules complies with the general safety standards and regulations. However, failure to operate this product as per the safety instructions available in this document may lead to hazards.

SCA modules are approved for the use in Hazardous areas such as Class1 Div2 Gr ABCD T4 & Zone 2, and IIC T4 Gc Locations with connections to Class I, Div2 and Zone 2, Group IIC locations. Permitted operating conditions are marked on labels for each SCA module. Check the operating condition limits of SCA before installing. One must be familiar with the currently applicable electrical installation standards and regulations before installing and operating SCA in hazardous areas. Installation, operation, and maintenance may only be performed by qualified personnel. Access to the circuits within the device is not permitted. Do not repair the device yourself or replace it with an equivalent device. Repairs may only be carried out by the manufacturer. Installation must be in accordance with any applicable local electrical requirements. For more details, refer to various electrical ratings in this document.

Signal Conditioning Assembly HAZLOC Manual provides the list of mandatory safety measures to be followed for HAZLOC applications.

2.2 Condition of Acceptability

SCA must be mounted inside a suitable housing with a minimum IP54 degree of protection for installation when used in accordance with IEC/ANSI/ISA 60079-15.

The housing must be a tool-secured enclosure that meets requirements as per IEC/ANSI/ISA 60079-0 and IEC/ANSI/ISA 60079-15 standards.

Do not connect/disconnect the device unless the power has been switched off or the area is deemed to be non-hazardous.

Installation must follow the enclosure, mounting, and segregation requirements of the application.

2.3 Safety Considerations

2.3.1 Explosion Hazard / Advertisement – Risque d'explosion

⚠ WARNING	EXPLOSION HAZARD – DO NOT CONNECT OR DISCONNECT UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS OR UNDER PRESCRIBED SERVICE CONDITIONS.

 AVERTISSEMENT	RISQUE D'EXPLOSION – NE PAS BRANCHER OU DÉBRANCHER À MOINS D'ÊTRE DANS UN ENVIRONNEMENT CONSIDÉRÉ COMME NON DANGEREUX, OU DANS DES CONDITIONS DE SERVICE PRESCRITES.

 WARNING	DO NOT REMOVE OR REPLACE FUSE AND DISCONNECT WHEN ENERGIZED UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.
 AVERTISSEMENT	NE PAS RETIRER OU REMPLACER LE FUSIBLE ET LE DÉBRANCHER LORSQU'IL EST SOUS TENSION, À MOINS QUE LA ZONE SOIT SÛR QU'IL N'EST PAS DANGEREUSE.

2.4 Security Guidelines

Ensure that the device is locked by DCS using the HART feature (refer command 71to Lock device in spec 151) to prevent any unauthorized configuration changes.

Physical access to device: DCS host and the SCA devices on the control network shall have physical access control. Otherwise a malicious operation on the LLIA-SCA will result in process Shutdown or impact process control. For maximum security, the LLIA-SCA device must be protected against unauthorized physical access.

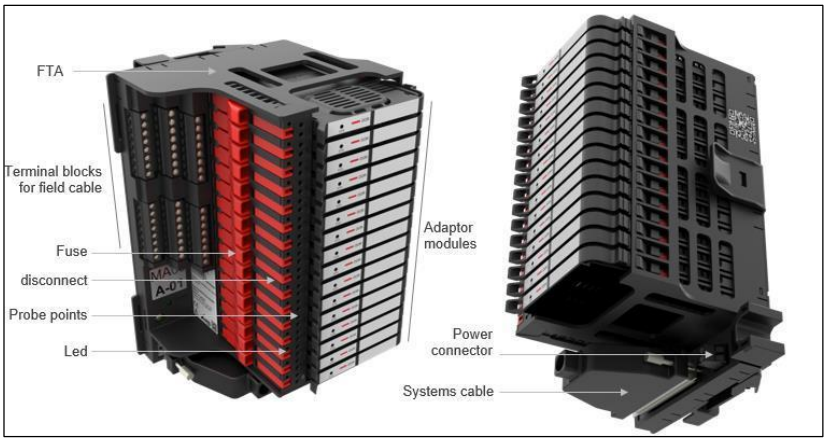
3 Purpose

3.1 Customer Problems

The following are some of the key opportunities in the context of marshalling solutions.

- Variability in the field wiring of different instrument signal types
- Nonstandard marshalling design using 3rd party hardware at low cabinet I/O density 100-240 I/O
- Making late changes in field device types and related wiring, with minimal impact on project schedule
- Expanding systems in brownfield projects or adding I/Os late in greenfield projects in a cost-effective manner
- Extensive effort for the design of each marshaling cabinet, which leads to considerable schedule impact in each project
- Enabling access to field wiring areas for service & maintenance , including termination and signal conditioning, while preventing access to DCS system components

3.2 Universal Marshalling Solution



SCA is Honeywell's one stop Universal Marshalling Solution. SCA offers highly integrated, low foot print and standardized marshalling hardware which is intended to be used along with Honeywell's IO modules.

SCA contains DIN rail mountable FTA which has a capacity to host 16 channels of signal conditioning modules and provided with integrated fuse and disconnect options making it an ideal building block for standardized marshalling solution.

SCA is designed for quick and easy installation and provided with a list of modules which are meant to be used for safe area or HAZLOC applications. Installation of SCA can be in regular 2m marshalling cabinets as well as in Universal Process Cabinets (UPC). In both cases, the cabinet assembly can follow one of the pre-defined assembly drawings which is suitable for customer installations.

3.3 Benefits

Following are the benefits of SCA:

- Supports uniform marshalling design for interfacing to general purpose and to hazardous areas
- Lifecycle support per Honeywell's long-term support model
- Temperature range -40°C to 70°C (-40° F to 158° F)
- Complements Universal I/O, extending LEAP to marshalling
- Eliminates 3rd party vendor designs, lifecycle costs and lead-time variations
- Enables custom cabinet usage with system I/O modules in front and USCA in rear 256 to 384 I/O
- Eliminates IOTAs used for GI-IS, externally powered I/O and temperature I/Os
- Segregates I/O modules from complicated field wiring
- Increases I/O density per marshalling cabinet from 448 to 720 I/O
- First party marshalling or signal conditioning
- Simple, compact, cost effective and repeatable
- Standard marshalling cabinet builds
- Compatibility with Honeywell IO families: Honeywell Series C and Universal IO modules
- Extends LEAP benefits to include field signal conditioning and wiring - a powerful combination with Universal I/O

3.4 Features

SCA offers a range of signal conditioning hardware pluggable to FTA and intended to use in a cabinet environment. Key features of FTA and supported modules are as follows..

Sl No	Hardware	Features
1	FTA (CC- USCA01) & FTA IS type (CC-UGIA01)	• Capacity of 16 channels • DIN rail mountable FTA with a capacity of 16 channels • integrated fuse and disconnect for field side terminals • Mass termination cable-based interface to Honeywell IO hardware • Dedicated 3 screw terminals per channel for field side connections

		• Installation in marshalling cabinets as well as Universal Process cabinets. • 2 or 3 wire interfaces towards field for each channel • 24V DC power with LED indication • Mass termination cable (MTC) for 16 channel system side interfaces • Screw less assembly to the base plate • Fuse blown indication for field side fuses • Disconnect function with current measurement terminals • IS type FTA has Intrinsic safety certification

List of modules supported

Sl No	Module	Features
1	Pass through (CC-UPTA01)	• Single channel pass through adaptor • 2 wires in / out
2	DI relay (CC-UDIR01)	• Single channel DI relay module (low voltage) • COM & NO connectivity to IO hardware • Coil activity LED indication • Input to output and channel to channel isolation • Provided with mistake proofing key
3	DO relay (CC-UDOR01)	• Single channel DO relay module (low voltage) • COM, NO & NC connectivity to field • Coil activity LED indication • Input to output and channel to channel isolation • Provided with mistake proofing key
4	Analog Input Barrier Module (CC-UGAI01)	• Single channel Analog Input IS barrier module with galvanic isolation • Transparent Open Wire Detection • 3-way Isolation • Supports 4-20mA with HART communication • Reverse Polarity Protection

5	Analog Input Isolator Module(CC-UAIA01)	• Single channel Analog Input isolator module • Transparent Open Wire Detection • 3-way Isolation • Supports 4-20mA with HART communication • Reverse Polarity Protection
6	Analog Output Barrier Module(CC-UGAO01)	• Single channel Analog Output IS barrier module with galvanic isolation • Transparent Open Wire Detection • 3-way Isolation • Supports 4-20mA with HART communication • Reverse Polarity Protection
7	Analog Output Isolator Module (CC-UAOA01)	• Single channel Analog Output isolator module • Transparent Open Wire Detection • 3-way Isolation • Supports 4-20mA with HART communication • Reverse Polarity Protection
8	Digital IO Barrier Module (CC-UGDA01)	• Single channel Digital Input Output IS barrier module with galvanic isolation. • Interfaces with Digital Inputs or Digital Outputs • Self-Configuring Digital Input Output mode • Digital Input support for NAMUR sensors or Dry Contacts • Digital Output Drive up to 40mA • Transparent Open Wire Detection • 3-way Isolation • Field Device Status Indication • Reverse Polarity Protection
9	Digital IO isolator Module (CC-UDXA01)	• Single channel Digital Input Output module with galvanic isolation. • Interfaces with Digital Inputs or Digital Outputs • Self-Configuring Digital Input Output mode

		• Digital Input support for NAMUR sensors or Dry Contacts • Digital Output Drive up to 40mA • Transparent Open Wire Detection • 3-way Isolation • Field Device Status Indication • Reverse Polarity Protection
10	Low Level AI (CC-ULLI01)	• Single channel RTD/TC module • AI channel interface to DCS • Loop powered module

NOTE	When the QR code is scanned, the following link will be opened. https://www.honeywellprocess.com/library/marketing/tech-specs/Digital-Input-Output-Barrier-CC-UGDA01.pdf

8.8.6 List of IO modules supported

	IO module	IOTA	IO type	Description
1	CC-PDIL01	CC-TDIL01, CC-TDIL11	DI-24	Low Voltage Digital Input (24 volts DC)
2	CC-PDIS01	CC-TDIL01, CC-TDIL11	DI-SOE	Low Voltage Digital Input (24 volts DC)
3	CC-PDOB01	CC-TDOB01, CC-TDOB11	DO-24B	Bussed Low Voltage Digital Output (24 volts DC)
4	CC-PDIL51	CC-TDIL51, CC-TDIL61	DI-24	Low Voltage Digital Input (24 volts DC)
5	CC-PUIO31	CC-TUIO31, CC-TUIO41	UIO-2	UIO-2

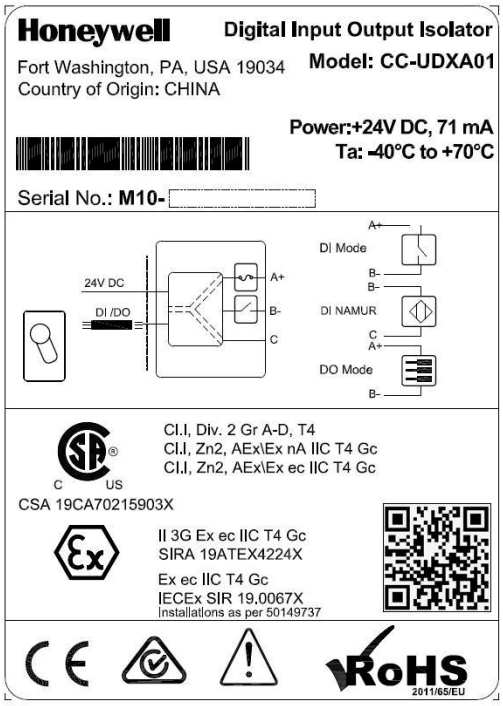
8.8.7 Fuse rating

Field side terminals of FTA assembly is provided with options for install M5 x 20mm glass fuse. In the case of Div2/zone2 installations instructions provided in HAZLOC manual to be followed. Exact current rating of the fuse may be decided based on the functional load current for a given IO.

8.8.8 Protection scheme

- Power supply terminals of the modules are provided with reverse polarity protection
- Power rail is provided with inrush current control
- Field side terminals are provided with short circuit protection and reverse polarity protection
- Modules are provided with mistake proofing keys

8.9.5 Label



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