2.   Chassis I/O – Series A

Specifications 2.1 Essential Concepts

Experion Chassis Series-A Modules and Platform

Chassis Input/Output Modules-Series A (CIOM-A) is a
chassis based platform. Modules exist in a single-wide
and double-wide form factor. Modules are inserted into
chassis slot positions; single-wide occupy one slot
position while double-wide modules occupy two slots. As
a platform, the chassis is host to not only I/O modules, but
modules that perform other functions.

Some examples include:

> C200E Control Processor
>
> Redundancy Module (RM)
>
> Battery Extension Module
>
> ControlNet Interface Module
>
> (CNI) Ethernet Module

The I/O modules are the focus of this document. Other
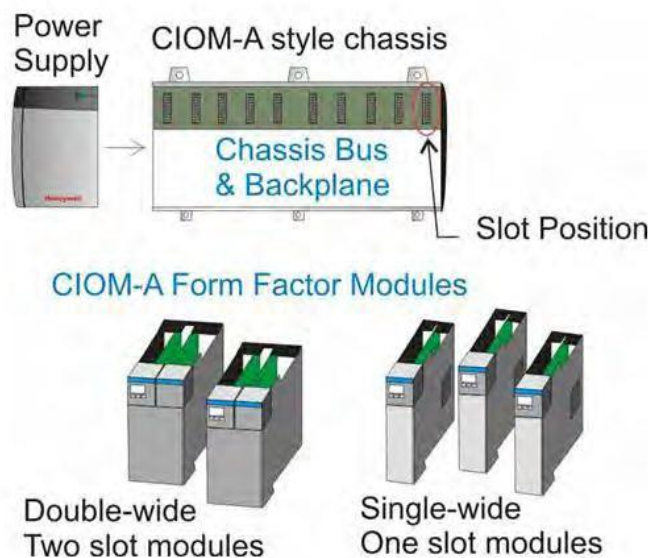module types are covered in separate Specification documents.

Figure 2-1 Experion Chassis Series

Power

Module power is supplied by a Series-A specific power supp y. Power suppliers are available in a redundant and non-
redundant configuration. The power module plugs to the left side of each chassis and does not consume a chassis slot
position. The power supply provides DC power for the modules inserted into the chassis. Field power is provided by
separate (external) power supplies.

Series-A Chassis Types

Chassis differ by the number of module positions or slots that the given chasses can accommodate. Chassis come in
five versions (4, 7, 10, 13, nd 17 slot). Some modules are double-wide and will use two chassis positions.

Model Number Conventions (TC and TK)

All model numbers are preceded by a **TC-** or a **TK-**. The TC designator indicates that the module is not conformal coated while
the TK designator indicates that the module has conformal coating applied. Aside from this the modules are identical.

Supported Control Processors

All CIOM-A I/O modules are usable with the C200E control processor.

C200E and the I/O ControlNet

Figure 3-1 shows how CIOM-A modules interface to the C200E control processor over the I/O Control Network. ControlNet is an open communication protocol developed by Rockwell and is based on RG-6 coax at 5 mega bit transmission speed. Coax segments can be extended using repeaters and fiber optic modules. Although the media can be redundant, the interface modules have a single set of electronics for both A and B cables.

The C200E or Downlink Chassis: This is the chassis that has the C200E inserted. It is also referred to as the "Downlink" chassis because it has the CNI (ControlNet Interface) modules that connect the C200E to the various remote I/O modules. The user can insert up to four total "Downlink" CNIs to create four separate I/O network routings. This provides the flexibility to create from one to four different I/O network branches.

Redundant C200E: When the C200E is implemented in a redundant configuration there are two chassis with an identical set of modules installed in the same physical positions.

Mixed I/O Families: As the figure, shows, CIOM-A I/O modules can be implemented on the same I/O Control Network as the RIOM-A module type. RIOM-A module are interfaced to the I/O CNet through ControlNet G teway modules and the CIOM-A modules are interfaced through the CNI module.

Downlink and Uplink CNIs: There are only two versions of the CNI (single media and dual media). The terms uplink and downlink are assigned based on the CNI location in the topology.

I/O ControlNet Limits:

Item	Limit	See
Maximum number of CNI modules/Downlink chassis	4	
Maximum number of uplink CNI's (I/O chassis) and Gat ways per downlink CNI	8	
Maximum number of I/O units per downlink CNI	24	Note-1
Maximum I/O units per C200E	64	Note-1 & 2
Note-1: In most cases an I/O unit is one I/O module. Some module types (like the SI and Profibus module) will consume more than one I/O unit. Note-2: PMIO (connected through the IOLIM) will also consume this resource.		

TC-HAO081, TK-HAO081

Table 6-30 HART- Analog Output, 8-Point, Current/Voltage Module

Parameter	Specification
Number of Points/Channels	8 output channels
Available output ranges for channels configured for non-HART. Voltage and Current Ranges:	Actual Range: Selection: Resolution: ±10.4 volts ±10 volts 16 bits (323 µV/bit) 0 to 10.25 volts 0-10 volts 15 bits (323 µV/bit) 0 to 21 mA 4-20 mA 15 bits (656 ηA/bit)
Available output ranges for channels configured for HART. Output is automatically set to Current Range only.	Actual Configuration Range: Selection: Resolution: 0 to 21 mA 4-20 mA 15 bits (656 ηA/bit)
HART Protocol Revision	Module is compliant with the specification for HART proto ol Revision 5.7
Module scan time (for the analog 0-100% output value)	10 ms for all (8) channels
Over voltage Protection	24 VAC/VDC continuous at room temperature
Short Circuit Protection Current Voltage	Electronically current limited to 21 mA or less. Electronically current limited to 35 A or less.
Drive Capability	>2000 (Voltage) 50-750 (Current) With short circuit prote tion for all (8) channels.
Calibrated Accuracy @ 25 C Calibration interval –	Better than 0.1% of range (Voltage) Better than 0.15% of range (Current) 12 months typical
RFI Immunity	Error of ss than 2.0% of range at 10 V/m, 27 to 1000 MHz

Output Settling Time
   Current Output, No HART
   Current Output, with HART
   Voltage Output
	
	<23 ms to 95% of final value with resistive loads
	<35 ms to 95% of final value with resistive loads
	<8.5 ms to 95% of final value with resistive loads

Offset Drift with Temperature	50 V/ C (voltage) typical. 200 nA/ C (current) typical.
Gain Drift with Temperature	20 ppm/ C (Voltage) maximum. 30 ppm/ C (Current) maximum.
Module Error Over Full Temp. Range	0.3% of range (Voltage) 0.3% of range (Current)
Isolation Voltage; User to system	100% tested at 2550VDC for 1second
Module Power Dissipation	6.3 W max
Backplane Current	See Module Power Consumption Data, page 46.
Open loop current detection Typical OC Detection Time	Current outputs only. For proper detection, the channel output value must be greater than 0.1 mA. Less than 5 seconds
Connection Terminal Blocks	TC-TBNH, 20-position terminal block
HART wiring mode supported	Point-to-Point only. Multi-drop is not supported.