

Tealware I/O

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Overview

SoftPLC Corporation's Tealware™ is a high density, modular I/O system, suitable for applications requiring as few as 16 digital and/or 4 analog points up through thousands of I/O points. The same I/O modules, racks, adapters, and other equipment can be used regardless of application size or physical configuration.

With a [Smart SoftPLC](#), local I/O interfaces are available that support up to thousands of points. With any SoftPLC CPU or other vendor's system that can act as a ModbusTCP master, Tealware can be used as remote I/O on Ethernet for flexible, distributed I/O configurations.

I/O modules available in the Tealware system include digital, analog, and specialty modules, with a range of signal types. Many common features of all modules make the system robust, and simplify installation and maintenance:

- Detachable front-end terminal block for easy module replacement without re-wiring (*some modules utilize a wiring cable connection, which is also easily detachable*)
- Front Panel LED display for status monitoring/troubleshooting
- High noise immunity
- Automatic Configuration - Module addressing based on location (*not DIP switch*) for easy system configuration & maintenance (*manual configuration option also supported*)
- Most modules are hot swappable under power
- Low power consumption means all module configurations are possible - no power calculations required

Specifications

Individual module specifications are available from the Tealware Modules section, or from the Tealware User Manual link in the Resources section.

All Tealware components conform to the general specifications below:

Dimensions (HxWxD)	I/O Modules: 141 x 38 x 110mm (5.5 x 1.5 x 4.3in) Power Supply Modules: 141 x 55 x 110mm (5.5 x 2.2 x 4.3in) Rack: IOBase06 (6 modules + P/S): 141 x 345mm (5.5 x 13.6in) Rack: IOBase08 (8 modules + P/S): 141 x 421mm (5.5 x 16.6in)
External Connections	20-screw Terminal Block Connector, max wire size #14 AWG or D-sub connector to cable (<i>HDIO-CBL</i>) to DIN-rail mounted terminal block
Operating Temperature	-20 to 70°C, -4 to 158°F
Storage Temperature	-40 to 85°C, -40 to 185°F
Airflow Clearance	50.8mm (2 inches) above and below unit for recommended ambient airflow
Humidity	5 to 95% non-condensing
Noise Immunity	1,500 volts peak to peak, 1 µs noise width at 30 to 100Hz
Vibration Resistance	10 to 55Hz, amplitude 0.075mm for 60 minutes
Shock Resistance	10g 3 times 3d directions
Dielectric Withstand	1500VAC for 1 minute across AC external terminals & ground
Impedance	75 MOhms at 500VDC
Electrical Safety	Class 2 protection
Operating Atmosphere	Non-corrosive atmosphere, with minimum dust
Certifications	UL, CE

System Configurations

Local I/O Configurations

A **Smart SoftPLC** provides a high speed local interface to Tealware I/O. A Smart SoftPLC supports up to 12 I/O Bases (*96 I/O modules*) for a maximum of 3072 points. You can scan thousands of points in under 1 msec!

Remote I/O Configurations

Smart Adapters provide a Tealware I/O Interface for remote I/O drops over Ethernet. Where more I/O is required than a local system supports, if the I/O needs to be distributed over a distance, or where the control system CPU is not a Smart SoftPLC (*eg: a SoftPLC Hardbook or non-SoftPLC controller*), then Tealware modules can be used with Smart Adapters on ModbusTCP Ethernet in a variety of configurations, with up to 127 remote I/O drops of up to 24 modules (*up to 768 I/O points*) per drop - tens of thousands of I/O in a single system.

Module Mounting

Tealware I/O modules mount onto a backplane. There are 2 module mounting interface options available for a Smart SoftPLC / Smart Adapter:

Backplane3 Interface



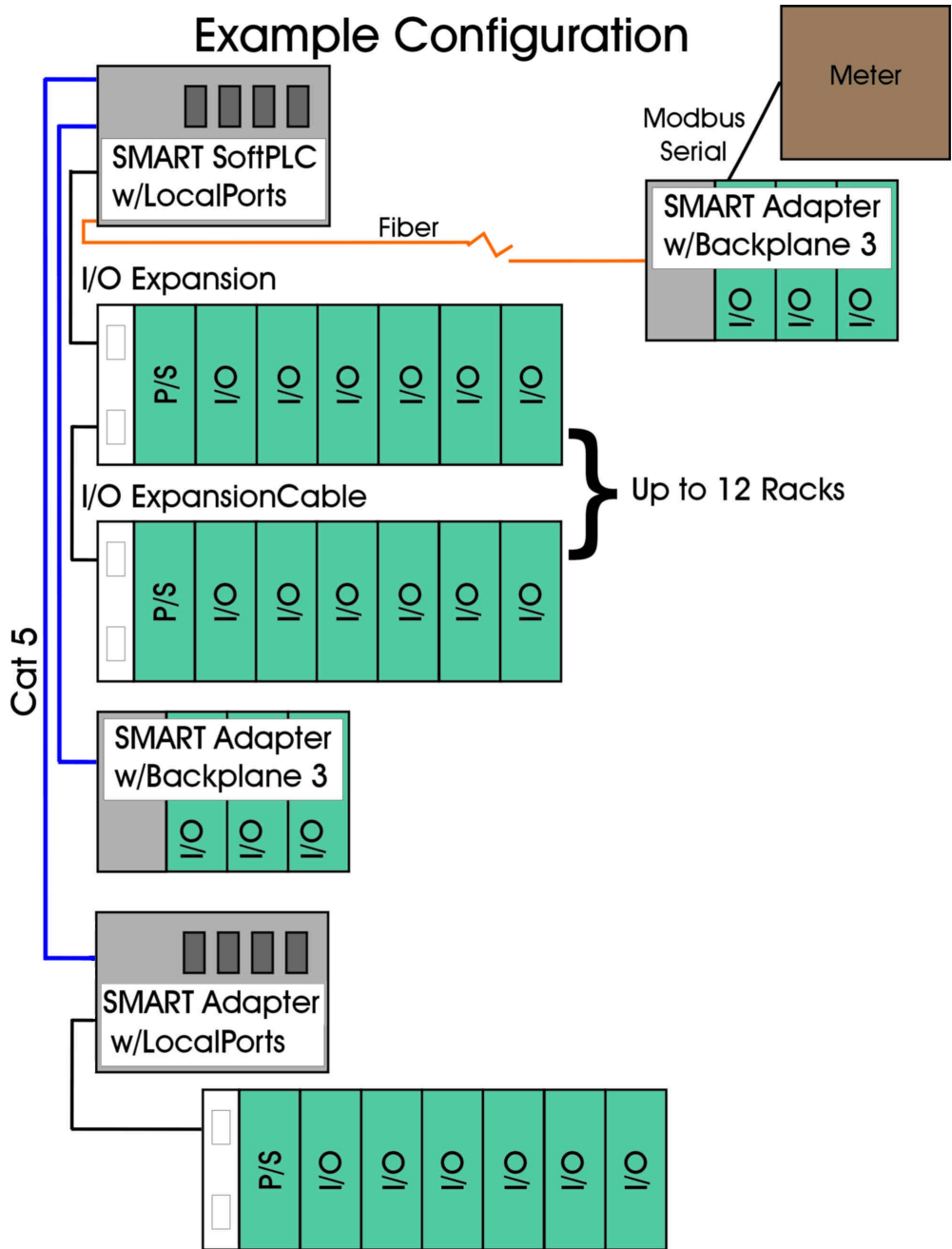
Any three (3) Tealware modules can mount directly onto a Smart SoftPLC or Smart Adapter equipped with a Backplane3 Interface.

LocalPorts Interface



If more than (3) modules are needed at a location, a Smart SoftPLC or Smart Adapter equipped with a LocalPorts Interface is used to connect I/O Base(s). The LocalPorts Interface has 4 I/O Base ports. A Smart SoftPLC can utilize all 4 ports, a Smart Adapter can utilize just 1 of the ports. I/O Bases can hold (6) or (8) modules plus a Tealware Power Supply Module. Bases connect via an Expansion I/O Cable, available in 2' or 4' lengths, from the Smart's I/O Base Port to an Expansion I/O Base (*as well as from I/O Base to I/O Base*). Up to (3) I/O Bases can be connected to each I/O Base Port.

Example Configuration



Tealware Modules

A comprehensive range of Tealware I/O modules is available - digital, analog, and special purpose modules. Combined with other components (*eg: bases, adapters, power supplies*), Tealware offers an expandable I/O system for both local and distributed control systems, big and small.

Most modules include as standard the wiring terminal block. Some high density modules require a cable and terminal block to be ordered separately, as indicated in the tables below.



Detailed data sheets are linked at each module's catalog number.

DIGITAL INPUT MODULES

Type	Operating Voltage	# of Points	Rated Current/ Point	Cat No
DC Input Sink/Source	9-28 VDC	16, 8/com	3 mA@12VDC 7 mA@24VDC	SXDC10
DC Input Sink/Source ^	9-28 VDC	32, 32/com	3 mA@12 VDC 7 mA@24VDC	SXDC20
DC Input Sink/Source	5 VDC (TTL)	16, 8/com	3 mA@4 VDC 4 mA@6 VDC	SXTTL10
AC Input Photocoupler	85-132 VAC	16, 8/com	15 mA	SXAC10
AC Input Photocoupler	24 VAC	16, 8/com	15 mA	SXAC24

^ Requires Terminal Block (*Cat No XDC20-TB*) and Cable (*Cat No HDIO-CBL*)

DIGITAL OUTPUT MODULES

Type	Operating Voltage	# of Points	Rated Current/ Point	Cat No
DC Output Sink/NPN	10-35 VDC	16, 8/com Fused, (2) at 2A	0.1 A	SYDC10
DC Output Source/PNP	10-35 VDC	16, 8/com Fused, (2) at 2A	0.1 A	SYDC20
DC Output Sink /NPN ^	10-35 VDC	32, 32/com Fused, (4) at 2A	0.1 A	SYDC30
DC Output Source /PNP ^	10-35 VDC	32, 32/com Fused, (4) at 2A	0.1 A	SYDC40
AC Output Triac SSR	85-264 VAC	16, 8/com Fused, (2) at 5A	0.6 A	SYAC10
Relay Output Dry*	5-125 VDC 12-250 VAC	16, 8/com	2 A	SYRY10
Relay Output Dry*	5-125 VDC 12-250 VAC	16, Isolated	2 A	SYRY20
Relay Output Dry*	5-125 VDC 12-250 VAC	8, Isolated	2 A	SYRY21
* External 24VDC Power required ^ Requires Terminal Block (<i>Cat No XDC20-TB</i>) and Cable (<i>Cat No HDIO-CBL</i>)				

ANALOG INPUT

Type	Operating Range	# of Channels	Resolution	Cat No
Analog Input	1-5, 0-10, ±10V 0-20, 4-20, ±20mA	4	15 bits	AD020
Analog Input	1-5, 0-10V	8	12 bits	AD030A
Analog Input	0-20,4-20mA	8	12 bits	AD031A
Analog Input^	0-10, 1-5, ±10V	16 isolated	12 bits	AD046
Analog Input^	0-20, 4-20, ±20mA	16 isolated	12 bits	AD047
RTD+	PT-100/1000, Ni-120	4 (4 DO)	15 bits	RTD10
Thermocouple+	B, E, J, K, R, S, T	5 (5 DO)	15 bits	THM10
+ External 24VDC Power optional ^ Requires Terminal Block (<i>Cat No AD04x-TB</i>) and Cable (<i>Cat No HDIO-CBL</i>)				

ANALOG OUTPUT MODULES

Type	Operating Range	# of Channels	Resolution	Cat No
Analog Output*	1-5, 0-10, $\pm 10V$ 0-20, 4-20, $\pm 20mA$	4	14 bits	DA020
Analog Output*	1-5, 0-10, $\pm 10V$	8	14 bits	DA030
Analog Output*	0-20, 10-20mA, $\pm 20mA$	8	14 bits	DA031

* External 24VDC Power required

SPECIAL PURPOSE MODULES

Type	Operating Voltage	# of Channels	Resolution	Cat No
High Speed Counter/ Frequency+	5 or 24VDC, Phase or Pulse	3 (3 DO)	32 bits, 50 KHz max	HSC11

+ External 24VDC Power optional

ACCESSORIES

Type	Catalog Number
Dummy Module for blank I/O slots	DUM10
High Density module cable to terminal block, 3 feet	HDIO-CBL
Terminal block for 32 pt digital modules	XDC20-TB
Terminal block for high density analog input modules	AD04x-TB

I/O Bases, Adapters, Power Supplies

The tables below list the components which are used with Tealware I/O modules to create complete systems.



Where applicable, data sheets are linked at each item's catalog number.

BASES / CABLES

Description	Catalog Number
Local I/O Expansion Base for P/S and up to 6 I/O Modules	IOBASE06
Local I/O Expansion Base for P/S and up to 8 I/O Modules	IOBASE08
Local Expansion I/O cable, 2 ft	EXCBL02
Local Expansion I/O cable, 4 ft	EXCBL04

POWER SUPPLIES

Description	Catalog Number
AC Power Supply, Input voltage 85 to 260VAC	PWS11
DC Power Supply, Input voltage 12 to 24VDC	PWS20C

ETHERNET REMOTE I/O ADAPTERS (ModbusTCP)

Description	Catalog Number
Smart Adapter w/ Tealware Backplane3 Interface	SMA4-B
Smart Adapter w/ Tealware LocalPorts Interface	SMA4-L
Panel Mount Bracket (<i>optional</i>)	SM-VBKT

Resources

Manual

[Tealware I/O User's Guide](#)

Tealware I/O Hardware manual, includes installation, module specifications, and analog module programming.

Data Sheets

[Tealware Datasheet](#)

Overview features/specifications of the Tealware I/O family of products.

[Tealware Bases & Configurations](#)

Specifications and Dimensions for Tealware I/O System components.

[Smart Adapter Datasheet](#)

Smart Tealware Adapter information, used for remote ModbusTCP Ethernet I/O drops.