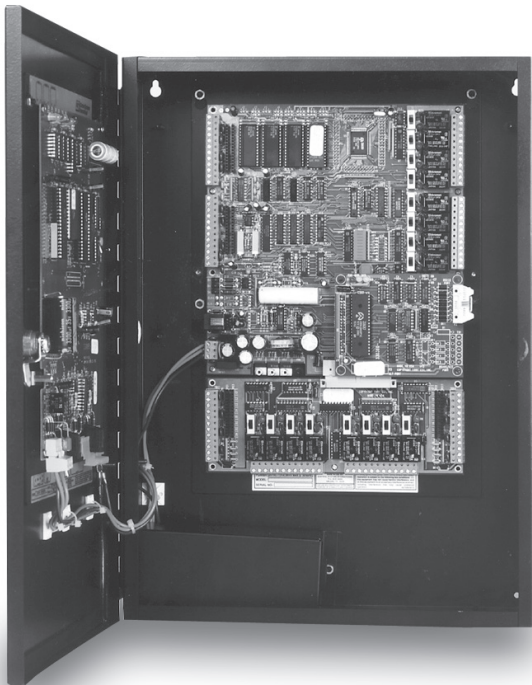


# TAC I/NET™ 7716

## Process Control Unit

TAC's Process Control Unit (PCU), part of the TAC I/NET™ family of products, provides direct control and monitoring of process functions from a "Peer-to-Peer" LAN-based controller.



# TAC I/NET 7716 Process Control Unit

## Features



### PRODUCT AT A GLANCE

#### PCU Features

- Direct Digital Control (DDC)
- Both Adaptive and Self-Tuning PID Algorithms
- Universal Inputs
  - Pulse
  - Analog
  - Discrete
- Configurable Outputs
  - Pulse Width Modulation (PWM) Analog Control
  - Form C Relay Discrete Control
  - Floating Control
- Peer-to-Peer Token Passing LAN Port, built-in
- Automatic LAN reconfiguration upon any fault detection
- Automatic Restart Procedure Upon Power Loss/Restoration
- On-Off-Auto Switches on all Outputs
  - Prewired for Status Feedback
  - LED Indicators for Output Status
- Look-Up Tables for each Input
  - 20 Segment Curve Fitting
- Analog Transducer Power Supply, built-in
- Local Port for PC
- Local Port for Auto Dial/Auto Answer Modem
- On-board Trending of all I/O Points
- Modular, Object-Oriented Programming
- Extensive Math/Logic Package
- Resident Programs for:
  - Environmental Control with DDC
  - Energy Management
  - Historical Data Collection
- TAC Baseplate Mounting
- Downloadable Firmware

These process functions include environmental control, trending, energy management, and process control, which may be executed locally in a standalone mode or “globalized” across the Token Passing LAN. The 7716 PCU is appropriate for commercial, institutional and industrial applications.

#### Controller Design

The 7716 PCU hardware is based on a monolithic board design, combining processing, memory, communications and field Input/Output (I/O) functions on a single printed circuit board. The controller features quick disconnect terminals, downloadable firmware, an RS-485 LAN port, one or two RS-232 ports, a TTL port for a hand held console, and optional on-board modem drivers. The inherent reliability of this monolithic design is further enhanced with extensive transient protection, automatic self-test features and a fiber optics communications option.

#### Control Functions

**Direct Digital Control** is provided by “Object Modules” that are used to develop global logic sequences. These Object Modules emulate pneumatic /electronic components and may be “linked” to create a wide variety of custom control sequences. Object Modules are available for: PID, Floating, High/Low Selector, 2 Position, Relay (with timer), and Reset (dual input).

**Automatic Time Scheduling** provides a full year’s schedule, including multiple start/stop times, special days and temporary inputs for each load.

**Automatic Temperature Control**, working in conjunction with Automatic Time Scheduling, self adjusts the heating or cooling setpoint, providing normal temperature control as well as setup/set back control, including user-specified deadbands.

**Predictive Central Plant Start** allows plant startup based on inputs from one or more space sensors.

# TAC I/NET 7716 Process Control Unit

## Features (continued)

**Demand Limiting** continuously monitors the rate of electrical power consumption and predicts the demand during each demand interval. If the predicted demand exceeds a preset level, controlled loads are shed or control setpoints changed in a user-defined priority sequence. As peak demand passes and electrical power consumption decreases, the controller restores the loads or setpoints to their normal routines. Multiple power meters are supported in each PCU with multiple loads specified for each meter. Maximum Off, Minimum On-Off, and seven levels of shed priority ensure efficient Demand Limiting, while protecting environmental control objectives.

**Calculated Points** are used to perform special calculations required by the system. Calculated points allow development of “equations” using math, logic, Boolean, time and other operators.

**Event Initiated Control** provides “IF-THEN-ELSE” control sequences, with time delay options, based on a state change or specified state of a point. Additional Functions include Runtime, Consumption and Alarm Inhibit.

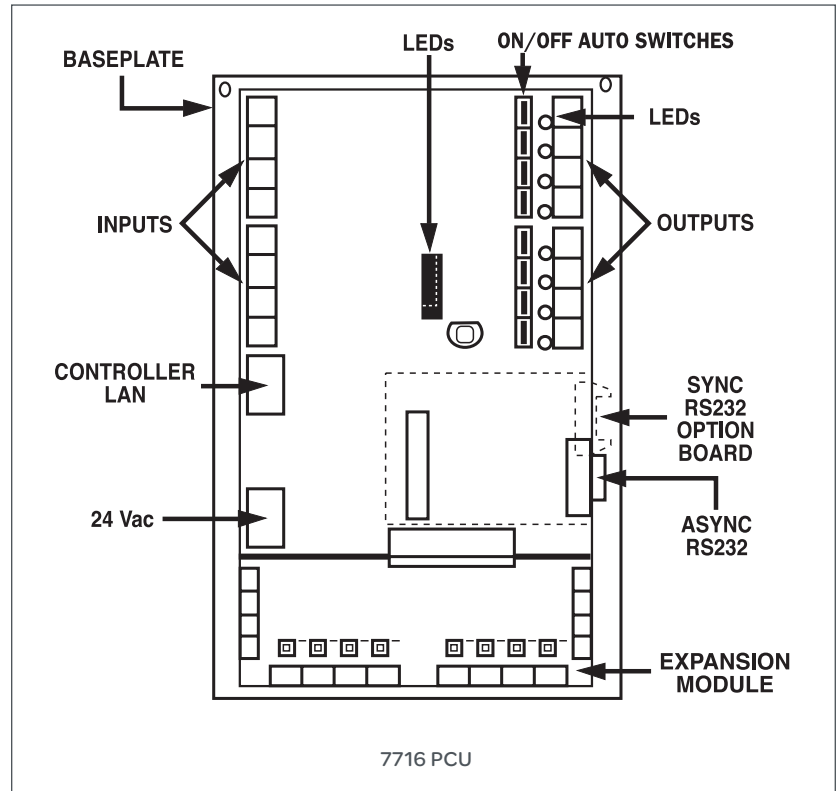
### High resolution Look-up Tables

Non-linear points may use a look-up table for linearization. The table contains as few as two or as many as 21 entries. Separation between entries is user-definable, allowing higher accuracy around the primary area of interest. Look-up tables may be used with linear or non-linear signals to clamp the end points to a specific value.

### Downloadable Firmware

Complete executable software is downloaded through a locally connected PC, LAN or a modem.

### Dimensional Drawing



# TAC I/NET 7716 Process Control Unit

## Features (continued)

### Online Editing Capability

The 7716 provides direct online edit capability via a local, remote or portable PC for instant modification of all parameters. An operator with the appropriate password authorization may make changes online that are as simple as time schedule changes or as comprehensive as chiller optimization strategies. There is no need to use archaic techniques that require compiling, debugging or reloading the software. The operator may observe the results of the changes instantly. All operator entries on TAC I/NET PCs use menus with self-prompting, fill-in-the-blank editors. Context sensitive help screens are available on the PC with the touch of the "F1" key. There is no need to learn a custom computer language or generate programming statements.

### Trend Sampling

Trend Sampling is accomplished within the controller independent of any PC workstation. Each PCU can trend all connected points and can store up to 1440 samples of critical points within the PCU. These samples can be archived to multiple local or remote PC workstations and used to generate custom reports.

Model Number	Description	Comments
7716	Process Control Unit, 8 UI, 8 DO (Relay), 24Vac	Baseplate Mounted, accommodates the RS-232 Communications Expansion Board, and/or one of the Point I/O modules listed below.
RS232 EXP	RS232 Communication Expansion Board	Allows Synchronous communications
P8UI	PCU Expansion Board – 8UI	8.5" x 3.2" (21 cm x 8.1 cm)
P8UI4AOC	PCU Expansion Board – 8UI & 4AO (4 – 20mA)	8.5" x 3.2" (21 cm x 8.1 cm)
P8UI4AOV	PCU Expansion Board – 8UI & 4AO (0 – 10Vdc)	8.5" x 3.2" (21 cm x 8.1 cm)
P8UI8DO	PCU Expansion Board – 8UI & 8DO (Relay)	8.5" x 3.2" (21 cm x 8.1 cm)
P8RTD	PCU Expansion Board – inputs (for 1000 Ohm, 3 wire RTDs)	8.5" x 3.2" (21 cm x 8.1 cm)
CBL072	Cable, Controller DE9 to PC DE9, 6ft (2 m)	
CBL073	Cable, Controller DE9 to PC DB25, 6ft (2 m)	
CBL074	Cable, Controller DE9 to Modem DB25, 6ft (2 m)	
TCON096	Model 7716 PCU Installation Guide	

# TAC I/NET 7716 Process Control Unit Specifications

## 7716 Process Control Unit

### Communication Port

#### Controller LAN

RS-485; 19,200 or 9600 baud, SDLC, token-passing

#### Hand Held Console Port

RJ-11 Modular, 1200 baud, TTL

#### RS-232 Port

PC @ 9600 baud (7801 tap function), or Hayes direct-dial asynchronous modem @ 1200, 2400 baud or 9600 baud

#### RS-232 Expansion Board Port

Supports synchronous modem, direct or two-way dial SDLC (78061 or 78035 tap functions) @ baud rates of 1200 to 9600 baud. Requires optional plug-on module.

### Network Wiring Requirements

#### Controller LAN Length

5000 ft (1500 m) per segment.  
25,000 ft (7600 m) with repeaters  
CABLE SUPPORTED: Twisted pair, shielded. 22 AWG (0.324 mm<sup>2</sup>) or larger, 30 pF/ft or less between conductors, 55 pF/ft or less conductor to shield, 85 to 150 Ohm impedance.  
Belden 9841 or equivalent

### Processor

#### Processor

Zilog Z181

#### Clock/calendar

Battery-backed, includes seconds, minutes, hours, day, month, year, leap year

### Memory

#### EPROM

32KB

#### Static RAM

256KBytes

#### NOVRAM

512Bytes

#### RAM Battery Backup

On-board Ni-cad, rechargeable. Maintains RAM for 300 hours

### Firmware

#### Binary Files

Downloadable to battery-backed RAM

### Auto Dial Support

#### Telephone Numbers

8, stored in NOVRAM

#### Number of Digits

31 per phone number

#### Supported

Phone, Beeper, Pager

### Physical Description

#### PCB Dimensions

9" L x 8.5" W x 1.8" D  
(22.9 cm x 21.5 cm x 4.5 cm)

#### Baseplate Dimensions

13.75" L x 9.6"  
(34.9 cm x 24.4 cm)

#### RS-232 Expansion Board Dimensions

4.3" L x 3.4" W  
(10 cm x 8.8 cm)

#### Weight

3 lbs

#### Power Requirements

24Vac, +10%, 50/60 Hz, 40 VA (max)

#### Operating Temperature

32°F to 122°F (0°C to 50°C)

#### Operating Humidity

0 – 90% RH, non-condensing

# TAC I/NET 7716 Process Control Unit Specifications (continued)

## 7716 Process Control Unit

### Input/Output

#### Look-up Tables For

#### Non-linear Input Points

Quantity: 32

Points on curve: 21

Curve point spacing:

User-defined Interpolation algorithm

#### Universal Inputs

May be either Analog, Lini-Temp, Pulsed or Digital per the following specifications:

#### Analog Inputs

0 – 5Vdc (default)

0 – 10Vdc

0 – 20mA

LTS80 LiniTemp

3-Wire 1000 Ohm RTD available via expansion board

Accuracy: +/- 0.1% (0 – 5V input)

0.5% (0 – 20mA input) @ 25°C

Resolution: 12-bit (0.024%)

### A/D Digital Filtering

Averaging (Notch) and glitch filters

### Analog Transducer Power Supply

24Vdc, 160mA max load

### Discrete Inputs

Dry contact input

Contact Excitation: 5V @ 5 mA

Pulse Input Rate: 4 Hz

Input Duration: 120 msec min

### Discrete Outputs

Form C (SPDT) relay,

3A resistive @ 24Vac/dc

On/Off/Auto switches: On board, with tri-state feedback

Modes: Latched, Momentary, or PWM proportional

### Analog Outputs:

Available via expansion board.

0 – 10Vdc @ 10mA

4 – 20 mA @ up to 13Vdc

Accuracy: 1% typical, 3% min

Resolution: 8-bit.

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On October 1st, 2009, TAC became the Buildings Business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.

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