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.
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 handheld 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/setback control, including user-specified deadbands.

**Predictive Central Plant Start** allows plant startup based on inputs from one or more space sensors.
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.
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.
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 mm2) 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
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
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 @ 5mA
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.

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.