

C.S.T. SERVICES

Serving Industry Since 1972

Control Systems Technician Services

Legacy PLC / HMI Code Recovery and Backup

Industrial Cyber Forensics / Data Retrieval / Documentation

559.289.0086

byron.sanders@cstservices.net

<http://www.cstservices.net>



SUMMARY OF SERVICES

(but not limited to)

INDUSTRIAL CONTROL AND AUTOMATION SERVICES:

PLC; HMI; OIT; SERVO; DRIVES; INDUSTRIAL PC;
OEM CONTROLLERS

Local OEM Support via Skype and Team Viewer

Code Backup and Retrieval

Custom Control Panels

Process Control

CNC and Machine tool diagnostics and repair

PLC repair/ programming/ documentation/ backup

HMI replacement/ new install/ programming/ backup

CAT5 and CAT6 cabling and testing; Industrial ETHERNET

Wireless control and monitoring- including remote access

Industrial Cyber Forensics:

location of original code files from defunct manufacturers

Industrial PC repair:

hard to find components for 286; 386; 486

PC DOS; DOS; Win 95; Win 98; Win 2000; XP- OS Recovery

Hard Drive backup and recovery; cloning

VISIO and AUTOCAD Documentation of existing systems

PDF Documentation for electronic manuals

Hard Copy Binders- projects and/or machines and processes

Data Acquisition- power monitoring/ reports

Legacy machines and systems

Foreign equipment repair and drawing translation

Motor and Motion Control- VFD; DC DRIVES; Encoders;

Servos; Oscilloscope; PWM;

Consultations; Estimates;

Inspections (safety; fire; power quality)

Surplus- Obsolete- and Used Equipment

Emergency Generator Systems

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SUPPORTED P.L.C.'s & SMART RELAYS:

Allen Bradley
ABB
Automation Direct
Bosch
Crouzet
Cutler Hammer D100
Easy
Eaton
Fatek
Fuji
Furnas
GE
GE-FANUC
Hitachi
Horner-APG
IDEC
Kinco
Koyo
Logo
Melsec
Mitsubishi
Modcell
Modicon
Moeller
Omron
Panasonic
Parker IQAN
Pico
Rexroth
Schneider
Shihlin
Siemens
Square D
TECO SGClient
Telemecanique
Texas Instruments
Toshiba EX10; 20; 40
Twido
Unitronics- PLC/HMI
Velocio PLC
Wago
Westinghouse
Xlogic PLC (Easy)
ZEN (Omron)

SUPPORTED HMI; MMI; OUI; TOUCH SCREENS; INDUSTRIAL PC:

Allen Bradley PanelView
Automation Direct
AVG-Uticor
Baldor
Broderson
Cutler Hammer
Eaton
Exor Uniop
EZ-Panel
EZ-Soft
EZ-Touch
FANUC Ladder III
HAKKO Monitouch V-SFT
Hitachi WinYUMO
Hitech ADP
Horner OCS; OIU; HMI
IDEC
KEP
Lauer
Maple Systems
PILZ
Proface
Quickpanel and Jr.- (TCP; Proface)
Quickpanel GE
Quickpanel View
Red Lion
TECO OP HMI
Magellis
Unitronics PLC/HMI (OPLC)
Vijeo
Weintek
Xlogic HMI
Zelio

SUPPORTED C.N.C.'s:

FANUC
Mitsubishi
Peddinghaus
Gernetti
Legacy systems
Foreign and unfamiliar
MAZAK
Mori-Seiki
*Too many brands to list
Just call...*

This is a Partial List:

(If you have any brands or models not named above- CALL US- we are adding support for different brands regularly)

RECOMMENDATIONS TO AVOID EXCESSIVE DOWNTIME ON EQUIPMENT WITH PROGRAMMABLE COMPONENTS:

1. Maintain up to date/ accurate binders on each machine and process. Make more than one copy. ONE FOR EACH OF THE FOLLOWING: (minimum)
 - Maintenance Office (with back up disks of Logic)
 - Maintenance Personnel (possibly two copies)
 - Machine/ Operator (if needed)
 - Administration (with back up disks of Logic and Software/ Software Licenses)
2. Make sure that **ALL PROGRAMMABLE EQUIPMENT** is backed up: **PLC; OCS; HMI; OIT; MMI; VFD; SERVOS;** etc. The **program code;** drawings; notes; manuals should be backed up- on hard drives and C.D.
3. Include a printout of the Ladder Logic in each binder along with any special manuals for **DRIVES; SERVOS; PROXIMITY SWITCHES; ETC.** Most manuals can be downloaded in PDF format and then archived electronically and printed for the binders. Obtain annotated copies of the Ladder Logic from the manufacturer or programmer if possible.
4. If a Maintenance person wants to take a binder home for extra-curricular study- have a binder for that purpose and use a check out procedure like the local library does- and the same goes for laptops.
5. If program changes are made by maintenance or an outside vendor- **update all binders, disks and printouts.**
6. If wiring changes are made on a machine- the person responsible should get approval and/ or **DOCUMENT THE CHANGES-** and initial and date the changes on the prints. As time permits the field drawings should be compared to the archives and updated in **AutoCAD or VISIO.**

The above recommendations can be accomplished by **C.S.T. SERVICES.** Proper **DOCUMENTATION** and the **MANAGEMENT** thereof is **THE MOST IMPORTANT FUNCTION** of the **Industrial Automation Business** in order to minimize down time. Maintenance personnel come and go. Vendors come and go. Sometimes the equipment is sold. A system or piece of equipment with good documentation will be easier to liquidate than equipment with missing or inaccurate documentation.

Regardless of the brand of PLC, DRIVE or CONTROLLER- call us. We have multiple brands and versions of software and cables in our inventory. Usually if we don't have it, we can get it.

Sometimes a recommendation to upgrade will be made if the controller is obsolete and no longer serviceable. Sometimes legacy components can be obtained from eBay or other sources. Sometimes critical equipment can be repaired for a nominal fee- board level repair, etc.

We had a \$5000.00 printed circuit board repaired in 2010 for \$250.00 locally (as an example) So if there are blown units sitting on a shelf and no spares or back up components are in your stock room, it is sometimes a good idea to have the old units repaired for an emergency. Other times an upgrade to a newer model or different brand is the wiser choice.

It is a good idea to identify unknown or unfamiliar components and make sure support is available and if the component or unit in question is still available. If it is not, is there an upgrade option?

Lost code can often be found using cyber-forensic methods and the Internet. Annotated versions of ladder code often can be obtained or created. Printed copies of ladder logic can be manually entered into any platform. This is a lot more efficient than starting from scratch for lost code.

Best Regards,

Byron K. Sanders

Byron K. Sanders- C.S.T.



**ASK ALL OF YOUR OEM's
FOR ANNOTATED CODE
BACKUPS AND PDF OR ACAD
DRAWINGS. THEN CALL US
FOR ONSITE BACKUPS AND
VERIFICATION.**

EMP-CME and COI

(Continuity of Industry)

OVERVIEW:

(Article excerpt from: "Protecting Yourself from EMP", by Duncan Long :

<http://www.aussurvivalist.com/nuclear/empprotection.htm>

EMP (Electro-Magnetic Pulse), also sometimes known as "NEMP" (Nuclear Electromagnetic Pulse), was kept secret from the public for a long time and was first discovered more or less by accident when US Military tests of nuclear weapons started knocking out phone banks and other equipment miles from ground zero.

EMP is no longer "top secret" but information about it is still a little sketchy and hard to come by. Adding to the problems is the fact that its effects are hard to predict; even electronics designers have to test their equipment in powerful EMP simulators before they can be sure it is really capable of with standing the effect.

EMP occurs with all nuclear explosions. With smaller explosions the effects are less pronounced. Nuclear bursts close to the ground are dampened by the earth so that EMP effects are more or less confined to the region of the blast and heat wave. But EMP becomes more pronounced and wide spread as the size and altitude of a nuclear blast is increased since the ground; of these two, altitude is the quickest way to produce greater EMP effects. As a nuclear device is exploded higher up, the earth soaks up fewer of the free electrons produced before they can travel some distance.

For more information, search the internet for EMP; CME; SOLAR FLARES; FARADAY CAGE

EMP can also be produced by CME (Coronal Mass Ejection). This emanates from the Sun. Solar flares happen all the time, but the intensity increases and decreases according to natural cycles. Every so many years a high intensity cycle occurs. The next BIG ONE is scheduled between now and spring of 2013, according to scientists. Congress has a bill called "The Shield Act" which would have protected our infrastructure, but to date they have not passed the bill. The military and other government critical systems have been protected to a degree. The private sector so far has been largely ignored. The last big event was in 1859 and we are overdue for the next one.

Here is an article about it, plus you can Google the subject for more:

http://en.wikipedia.org/wiki/Solar_storm_of_1859

On September 1-2, 1859, the largest recorded geomagnetic storm occurred. Aurorae were seen around the world, even over the Caribbean; those over the Rocky Mountains were so bright that their glow awoke gold miners, who began preparing breakfast because they thought it was morning.[3] People who happened to be awake in the northeastern US could read a newspaper by the aurora's light.[4] Telegraph systems all over Europe and North America failed, in some cases shocking telegraph operators.[5] Telegraph pylons threw sparks and telegraph paper spontaneously caught fire.[6] Some telegraph systems continued to send and receive messages despite having been disconnected from their power supplies.[7]

We did not have a power grid then. We were not reliant upon electrical power then. Our infrastructure was not reliant upon computers and electronics then. Scientists are concerned if an event hits North America it could set us back to the 1500's lifestyle for quite awhile until repairs are made. No one knows for sure, but the prudent will prepare the best they can, like the military already has done and is doing.

We may not be able to protect all of the equipment in a typical industrial plant or office, but we can at the very least protect the critical data for recovering the plant operations after an event. The most important data in the industrial plant is backup code from all programmable devices: PLC; HMI; OIT; OPLC; SERVO; DRIVES; etc. (You may want your office and personal data protected as well, like family photos and the like).

Once the code is backed up, copy it to "light storage" devices such as DVD; CD. These disks do not use magnetic storage, but are light inscribed. Or put the data on portable USB drives which are then stored in a Faraday bag, cage or enclosure. To test your enclosure or bag, use the following test: place your cell phone in the enclosure and try to call the phone from another line. If the call is blocked, more than likely it will block the EMP or CME waves which are similar to Micro Wave radiation. There is debate over whether the enclosure should be grounded or not. As of October 2012 we are still researching this topic for the best recommendations. The information on this topic is quite convoluted, to say the least.

If and when an event happens your equipment can be replaced, the data is another matter all together. It takes TIME to re-write program code, depending on the complexity of the process or machines it can take months.

Assuming the grid is restored in a timely fashion, the industrial plant can be put back into production much faster IF you have PROTECTED BACKUPS of your program code.

If you are interested in protecting your code for COI, please contact us.

Byron K. Sanders

Byron K. Sanders- C.S.T. SERVICES

CSTS-10.04.2012

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C.S.T. SERVICES PARTIAL CLIENT LIST SINCE 1972

ACX Pacific Northwest (International Animal Feed)
A.P.C.C.O
Air National Guard
American A.V.K
American Beauty
Angelica's Laundry
Athens Bakery
ATMF
Automated Controls
Avenal Prison
Banks and Company
Bee Sweet
Bell Tech
Borba Gin
Brownie Baker
Bruno's Iron and Metal
Butterfield Brewery
Canfield Construction
C.D.I
Calgren
California Compress
California Industrial Service
Calmat
Cardio Heart Center
Cargill
Caruthers Liquor
Catholic Charities
Cellulo
Central Valley Machining
Certainteed Glass
Chamlian
Channel 24
Channel 49
Channel 61
Cheston Oil
China Lake
City of Clovis Water Works
City of Fresno
Clipay (film extrusion)
Cocola Broadcasting
Computer Designers
Corcoran Prison
Crimson Resource Management
Dale Brisco
Darling International
Delno Terrace
DOSCO
Dow Chemical
Drip-In Irrigation
Dr. Pepper
Dry Creek Construction
Dumont Printing
Earth Grains
East Electric
Electric Motor Shop
Electronic Recyclers
Elliot Manufacturing
EPS- REDI-VOLT
Fab Tech
Fig Garden Packing
Fiore Pasta
Foster Farms Chicken
Foster Farms Feed Mill
Foster Farms Dairy
Foster Farms Hatchery
Franz Family Bakeries
Franzia Wineries
Fresno Air Guard
Fresno Air Terminal
Fresno Bee
Fresno Beef Processors
Fresno City Waste Water
Fresno Diocese
Fresno Farming- Traver Feed Mill
Fresno Rescue Mission
Fresno School District

Gallo Winery
Gary Brown Construction
G- Building
Gee Manufacturing
Geil Enterprises, inc
Georgia Pacific
Gleim Crown Pump
Giumarra
G.S.A.
Guardian Glass
Gurjant Gill Residence- Caruthers
Hansen Brothers
Harris Beef
Heavens
Helm Bean and Seed
Hines Color
Holiday Inn
Hunt Wesson- Helm Plant
Huron Ginning
HydraTech
Hydrite Chemical Company
I.R.S.
I.S.C. (automatic doors)
Inspections for P.G.& E
Integrated Grain & Milling- I.G.M
International Paper
Industrial Repair (Carwashes)
Jack's Carwashes
Jack Frost- Fresno
Jack Frost- Visalia
James L. Davison and Associates
Jensen and Pilegard
JS West Propane
Kaweah Container
Kearney Manufacturing (Foundry)
Kemmer Ag
King-O-Meat
Klink Citrus
Kochergen Farms
La Tapatia Tortilleria
Leprino Foods
Levi's Iron and Metal
Lion Packing
Lone Star
Madera Glass
Madera Waste Water
Manna Pro
Margie Hinds Women Center
MB Technologies
McBride Electric
Miller- Marthedahl Refrigeration
Mission Organics
Morello Trust (Gene Blonder)
Morning Star Farms
Mt. Whitney Gin
Nazareth House
Nada Pacific Corp
Northrup King (Seed)
O'Neil's Beef
Orange Avenue Disposal
Pacific Boring
Pacific Coast Packing
Paper Pulp and Film
Parichan
Park Industries
Peninsula Packing
Penny Newman
Peabody Floway
Point Source Irrigation
Peoples Church
Pepsi
P.R. Farms
Pro Equipment
Producer's Cotton Oil
Producer's Dairy Delivery
Pro Screen

Rainbow Bakeries
Rain For Rent
Rancho Realty- Jack Emerzian
Rand Machine Works
Raymond Granite (Cold Springs)
Red Carpet Carwashes
Red Cross
Redi-Volt
Renaissance Old World Inc
Rio Bravo Bio-Mass Plant
Rock Plants
Roger Rocka's
Rosendahl Dehydrator
RPM Beef and King-O-Meat
Ruiz Foods
Rutter Armey
Salvation Army
Sanger Boats- Stelling's Marine
San Joaquin Memorial H.S.
Santa Barbara Technology
Ski's Iron and Metal
Siemens
Sierra Vista Mall
Simplot
Smurfit- Stone Fresno Container
Division
Social Security Administration
Specialty Branded Products
Specialty Steel
Spray Force Mfg. Inc
Stainless and Steel Welding
St. Helen's
St. John's Cathedral
Sultana Water (City of)
Sunmaid Raisins
Sunmet Raisins
Swanson's Machine and Hydraulic
Tenty Construction
T.G. Schmeiser
Tom's Foods
Tower Theater
Trinity Fruit Packing
U.S. Cold Storage
Ulbrich of California
United Japanese Christian Church
Used Pallet Company
Valley Detroit Diesel
Valley Fig Growers
Valley Foundry
Valley Lahvosh Bakery
Valley Manufacturing (CNC)
Valley Welding
Vulcan
Wade Irrigation
Warnor's Theater
Wasco Hardfacing
Wasco Prison
Wawona Frozen Foods
Western Foam Pack (foam blow mold)
Wilson's Theater
WorkForce
Zacky Farms
Zemarc Corporation

INDUSTRIES SERVED- PARTIAL LIST SINCE 1972

Automated Conveyor Systems:

Various Clients

Bakeries:

Conduit; wiring; Automation; Ethernet; Training; Safety Inspections; Documentation

Continuous Batch Plants:

Instrumentation; PLC Automation; HMI; Integration; Documentation

Dairy Industry:

Dairies; Dairy Processing; Bottle Extrusion; CIP

Emergency/ Backup Generators/ Transfer Switches:

Television transmitters; Red Cross; Government; Private Parties; Businesses

Fuel Systems:

Gasoline; Diesel; Propane; Butane; Service Stations; Car Washes; controls; Class I, II, III; Bulk Storage

Food Processing Plants:

Various projects- power systems; conveyor systems; Automation; PLC; HMI

Fire Alarm Systems:

Control wiring; testing

Foundries:

Various Equipment

Glass Industry:

Sheet; Fiber; Bottles

High Voltage Work: (4160- 12KV)

High Schools; Airport; Water Districts; Plants; Municipalities

Industrial Ethernet:

Structured Cabling- CAT5- CAT6; Testing; Tracing; Installations; Wireless; Remote Access

Lumber Industry:

Sawmill; Excelsior; Pallet Manufacturers

Machining:

C.N.C.; Lathes; Mills; RS-232 Networks; Ethernet

Medical:

Equipment Connections- conduit; wiring per NEC: XRAY and other equipment

Military:

Various projects; controls; testing; compliance issues

Petroleum Industry:

Gasoline; Diesel; Bulk Storage; Butane; Propane; JP8; Computerized Dispensers; POS; Mini Marts; Garages; Service Stations
JP8- Aircraft- Cathodic Protection

Prison Systems:

Various projects; controls; programming

Restaurants:

Point of Sale (POS); Ethernet- LAN

Printing Industry:

Printing Presses- connections; troubleshooting; foreign language translation for schematics

Prison Industry:

Levels one; two; three and four- security systems; fire systems; waste water systems; CATV; new construction

Rock Plants:

Troubleshooting/ Repair; Automation; MSHA Compliance Inspections; Gold Recovery

Refrigeration Controls:

Troubleshooting/ Repair; Installation of controls and control wiring; PLC; HMI

Theater:

Stage Lighting; power systems

Waste Water:

Automation; PH Factor Monitoring- Adjustment

Commercial; Banks; Residential; Pools- Spas; Government; Feed Mills; More.....

(06.10.2013)