



MAINTENANCE MANUAL ANGI SERVICE

COMMUNICATIONS PANEL (CP400)
ANGIComm Version 1.1

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1. SPECIFICATIONS

Data Collector

Red Lion Data Station Plus - DSPSX

Power Supply Input.....24 VDC, 200mA

Maximum Temperature.....50° C

Memory

On-board Flash 4 Mbytes

On-board SDRam 2 Mbytes

CompactFlash 1 Gbytes

Certifications

FOR USE IN HAZARDOUS LOCATIONS:

Class I, Division 2, Groups A, B, C, and D

UL Listed, File #E302106, UL508, CSA 22.2 No. 14-M05, File #E179259,

UL61010-1, CAN/CSA-C22.2 No. 61010-1 and File #E317425, ANSI/ISA

12.12.01-2007, CSA 22.2 No. 213-M1987

UL Listed, File #E317425, ANSI/ISA 12.12.01-2007, CSA 22.2 No. 213-M1987

LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards

IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

Router

Phoenix Contact FL MGuard RS2000 TX/TX VPN

Power Supply Input.....24 VDC, 2.2W

Maximum Temperature.....60° C

Memory

microSD 1 Gbytes

Certifications

UL Listed / cUL Listed / cULus Listed

Ethernet Switch (16-port)

N-Tron 116TX

Power Supply Input.....24 VDC, 300mA

Operating temperature..... -40 to 85C



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Regulatory Certifications

- Safety: Class I, Division 2, Groups A, B, C and D, T4
- EMI: ANSI C63.4; FCC CFR Title 47, Part 15, Subpart B - Class A; ICES-003 – Class A
- EMC: EN61000-6-4 – Class A (Emissions), EN 55024 (Immunity), EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (RF), EN61000-4-8 (PFMF), EN61000-4-11 (VDI)
- GOST-R certified

Further information regarding this product's regulatory conformity can be found on the N-Tron website at www.n-tron.com/regulatory



DC Power Supply

Phoenix Contact TRIO-PS/1AC/24DC/2.5 - 2866268

Power Supply Input.....100-240 VAC, 45-65 Hz

Power Supply Output.....24 VDC, 2.5A

Maximum Temperature.....55° C

Certifications

UL Listed / cUL Listed / cULus Listed

**ANGIComm****Modem (Optional)**

Phoenix Contact Modem – PSI-MODEMETH - 2313300

Power Supply Input.....24 VDC, 100mA

Maximum Temperature.....55° C

Certifications

UL Listed / cUL Listed / cULus Listed

Cell Modem (Optional)

Phoenix Contact Cellular Modem – PSI-MODEM-3G/ROUTER - 2314008

Power Supply Input.....24 VDC, 200mA

Maximum Temperature.....60° C

Certifications

UL Listed / cUL Listed / cULus Listed

Radio: DIN EN 301511

CE conformance according to R&TTE Directive 1999/5/EC

EMC: EN 61000-6-2

Safety: EN 60950



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2. IMPORTANT INFORMATION

USER MODIFICATION

ANGI must authorize all modification to this equipment. Any unauthorized modification to this equipment and or software will void the warranty.

CAUTION !

MODIFICATION MAY DAMAGE THE EQUIPMENT AND CAUSE BODILY INJURY

DISCLAIMER

ANGI disclaims any responsibilities what-so-ever to the customer or to any person for injury or damage to, or loss of, property or value resulting from the use of its products which have been subjected to misuse, accidents, misapplied, repaired by unauthorized person, or improperly installed.

NOTICE: This manual is as current as possible at the time of printing and is subject to change without notice. For information not covered in this manual or further clarification, contact ANGI Customer Service.

CONTRACTOR OR INSTALLER: Leave this manual with the Unit station after installation is complete.

CUSTOMER: Retain this manual for future reference.

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3. INTRODUCTION

This manual contains information on the operation and maintenance of ANGI CP-400 Communications Panel. This package is designed to provide:

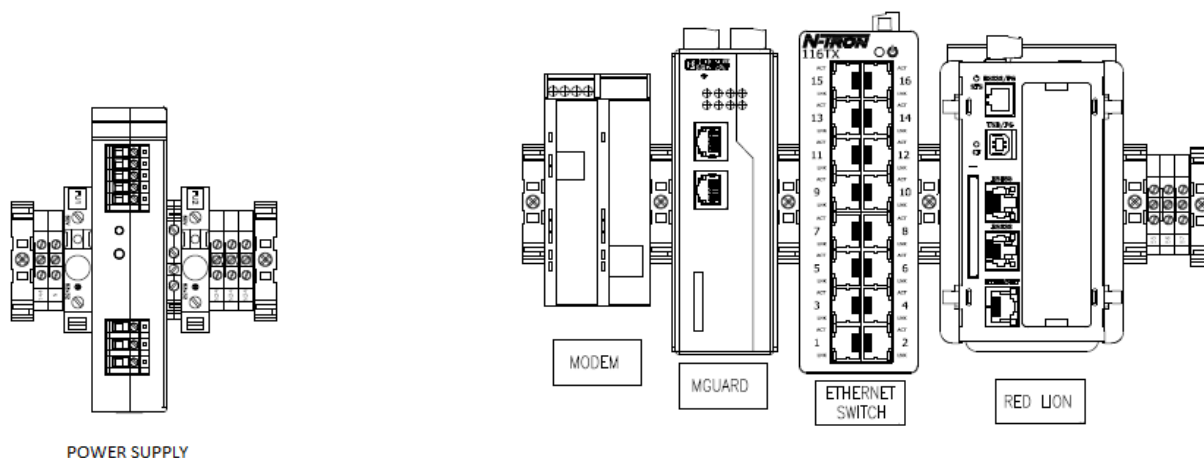
- 1) A secure central communications point for ANGI CNG site
- 2) Full-time equipment monitoring
 - a. Email and text message for system faults
 - b. Continuous time-based logging of system operating parameters
 - c. Continuous event-based logging of system events
- 3) Local web server for real-time and logged data display
- 4) Remote access for ANGI data collection and support via secure VPN connection
- 5) Network Address Translation (NAT) for secure interface to customer network



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4. SYSTEM OVERVIEW

The following figure shows the major components of the CP-400 Communications Panel.



Starting from the left

- 1) 24VDC power supply
 - Powers all other components in this panel
 - Requires 120VAC, 60Hz voltage input
- 2) mGuard Router
 - WAN port connects to customer-supplied Ethernet with Internet access
 - LAN port connects to Ethernet Switch (shown above)
- 3) Ethernet Switch
 - Main connection point for site-level communications
- 4) Data Station – Red Lion DSPSX
 - Data monitoring and logging
 - Ethernet port connects to Ethernet Switch (shown above)
 - Optional RS485 connection to CNG dispensers
- 5) Phone modem (optional)
 - Standard phone port connects to customer-supplied “land line”
 - Ethernet port connects to Ethernet Switch (shown above)
- 6) Cell modem (optional – not shown)
 - Requires customer-supplied SIM card with paid data plan
 - Ethernet port connects to Ethernet Switch (shown above)



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Basic Feature Set

The standard ANGIComm package includes the following features.

- 1) Central connection point for site-level Ethernet communications
- 2) Secure VPN connection to ANGI Engineering and Service center (via customer-supplied Internet connection)
- 3) Full-time monitoring of connected control components
 - a. PLC Compressor, Storage, and Dispenser controls (via Ethernet)
 - b. Series 2 dispensers (via RS485)
- 4) Data collection and logging for these components
- 5) Alarm monitoring for these components
 - a. Alarm emails via Internet SMTP
 - b. Alarm text messages via Internet SMTP
- 6) Local storage of data and alarm log files
- 7) Periodic upload of log files to ANGI for database entry and long-term storage (via Internet FTP)
- 8) Customer access to site level devices and information via Network Address Translation
 - a. Customer provides a list of static TCP/IP addresses on their network
 - b. The ANGIComm router is programmed to provide access to the site level devices at the addresses specified by the customer. This would most likely include the Red Lion data collector, but could also include any other site-level Ethernet devices (PLCs, HMIs, etc.)
 - c. Customer access via NAT will include:
 - i. Access to data log files as shown in [Data Log Files](#) section.
 - ii. Local web pages with the real-time and logged content shown in [Data Website](#) section.

Optional Features

Extra-cost options to the ANGIComm package include:

- 1) Telephone modem
 - This modem provides low-speed and bandwidth connection to the site-level Ethernet network for basic support functionality. **It cannot support any FTP or SMTP functions** (i.e. no log file upload, no alarm emails or texts).
- 2) Cellular modem
 - This modem can provide a fully functional internet connection for the site, but in addition to initial costs for the modem
 - i. The customer will be responsible for providing a SIM card with the necessary data plan from an approved cellular provider (list available from ANGI)
 - ii. The customer will be responsible for any initial and on-going cellular service charges
 - iii. The customer will need to supply ANGI with any necessary authentication information for modem configuration

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- The amount of data transferred via this connection for standard functionality (FTP log files, SMTP emails/texts) is minimal.

Expanded Data Functionality

When the logged data files are collected at ANGI Engineering and Service Center, the data is extracted, formatted, and stored in a relational database (Microsoft SQL Server).

Currently, development projects are on-going to provide customer access to this data in the form of customized reports delivered on a subscription basis (daily, weekly, etc.), and web-based customizable reports.

Please contact ANGI Sales for details and pricing.



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5. FUNCTIONAL DETAILS

5.1 ETHERNET SWITCH

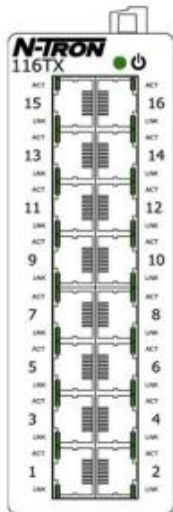


The switch used is unmanaged. It is the communications hub for the site. All other Ethernet devices (PLCs, HMIs, modem, router, data collector) are connected to it. All devices at this level are on Ethernet network with the following subnet settings:

IP Address range = 192.168.10.1 to 192.168.10.254

Subnet Mask = 255.255.255.0

Gateway IP Address = 192.168.10.254



From Top to Bottom:

SPD Speed LED

LNK/ACT Link/Activity LED

RJ45 Ports Auto sensing 10/100BaseT Connection

Green LED lights when Power is connected

NOTE: The top LED indicates Link/Activity (LNK/ACT), and the lower LED indicates Speed (SPD) status.



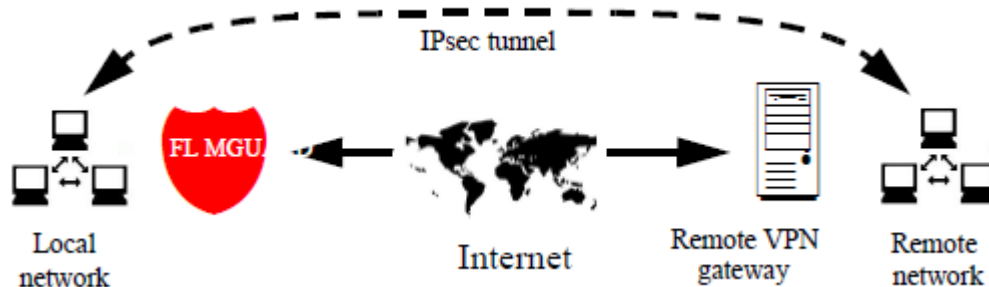
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5.2 ROUTER



The FL MGUARD RS2000 is a security router with basic firewall and integrated IPsec VPN (maximum of two tunnels). It is used in this application to provide a secure connection to an external Ethernet network (supplied by the customer).

This device initiates a secure VPN connection to ANGI for central data collection and remote support. It acts as a portal for the data collector to display live data and logs via an on-board web server, send emails and text messages for alarm conditions, and send logged data via FTP to ANGI for archiving. It also provides external network access to site-level devices using static IP addresses specified by the customer. In the figure below, red shield would represent this package, the local network would be ANGI's equipment site network.



The external network must provide the following features in order for this device to provide the intended services:

- 1) DHCP server or specified reserved static IP address
- 2) Internet access
- 3) Ports 21, 25, 500, and 4500 open through firewall



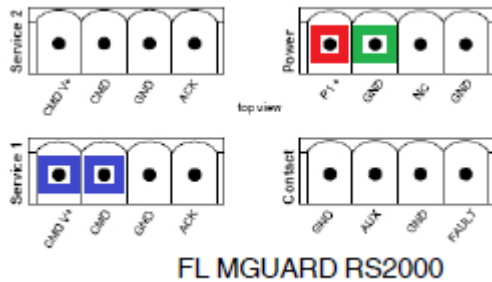
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5.21 Hardware Connections

The RJ45 CAT5 network ports are connected as follows:

- X1 WAN – Connected to external Ethernet supplied by customer at the site
- X2 LAN – Connected to Ethernet switch in this panel.

Top Terminal Connections



The only terminal connections used in this application are shown above.

Red = +24VDC

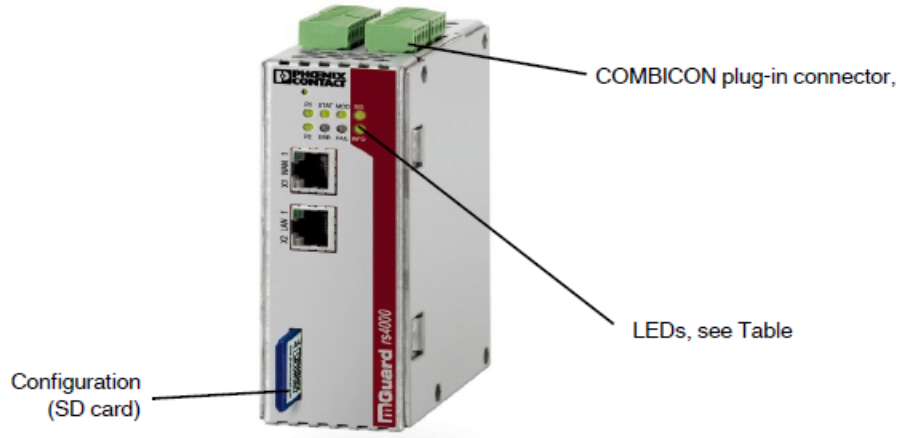
Green = DC Common

Blue = Jumper between CMD V+ and CMD pins



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5.22 General layout and LED functional description



LED	State	Meaning
P1	Green ON	Power supply 1 is active
P2	Green ON	Power supply 2 is active (FL MGuard RS2000: not used)
STAT	Flashing green	Heartbeat. The device is connected correctly and is operating.
ERR	Flashing red	System error. Restart the device. – Press the Rescue button (for 1.5 seconds). – Alternatively, briefly disconnect the device power supply and then connect it again. If the error is still present, start the <i>recovery procedure</i> (see "Performing a recovery procedure" on page 8-2) or contact the Support team.
SIG	–	(Not used)
FAULT	Red ON	The alarm output is open due to an error (see "Installing the FL MGuard RS4000/RS2000" on page 4-3). (The alarm output is interrupted during a restart.)
MOD	Green ON	Connection via modem established
INFO	–	(Not used)
STAT+ ERR	Flashing alternately: green and red	Boot process. When the device has just been connected to the power supply. After a few seconds, this LED changes to the heartbeat state.
LAN	Green ON	The LAN/WAN LEDs are located in the LAN/WAN sockets (10/100 and duplex LED) Ethernet status. Indicates the status of the LAN or WAN port. As soon as the device is connected to the relevant network, a continuous light indicates that there is a connection to the network partner in the LAN or WAN. When data packets are transmitted, the LED goes out briefly.
WAN	Green ON	



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5.23 Software Configuration

The software configuration is provided by ANGI and stored on the SD memory card inserted in the front of the unit. It is automatically loaded from SD on power-up.

The configuration includes a complex security certificate following the X509 standard. The X.509 authentication method relies on certificates to ensure that the "correct" partners communicate with each other and that no "incorrect" partner is involved in communication. This makes the VPN tunnel connection to ANGI secure from any intrusion.

The configuration should NOT be modified without consulting ANGI.

ANGI can make any necessary modifications or updates via the VPN connection and save them to the SD card.

In addition to security certificates and VPN tunnel parameters the following items are configured.

- Local port configuration (site subnet)
- WAN external port configuration (DHCP or static)
- Network Address Translation tables (NAT translates local subnet IPs to external static IPs if required by customer, ex. 192.168.10.10 local to 172.16.32.45 external).



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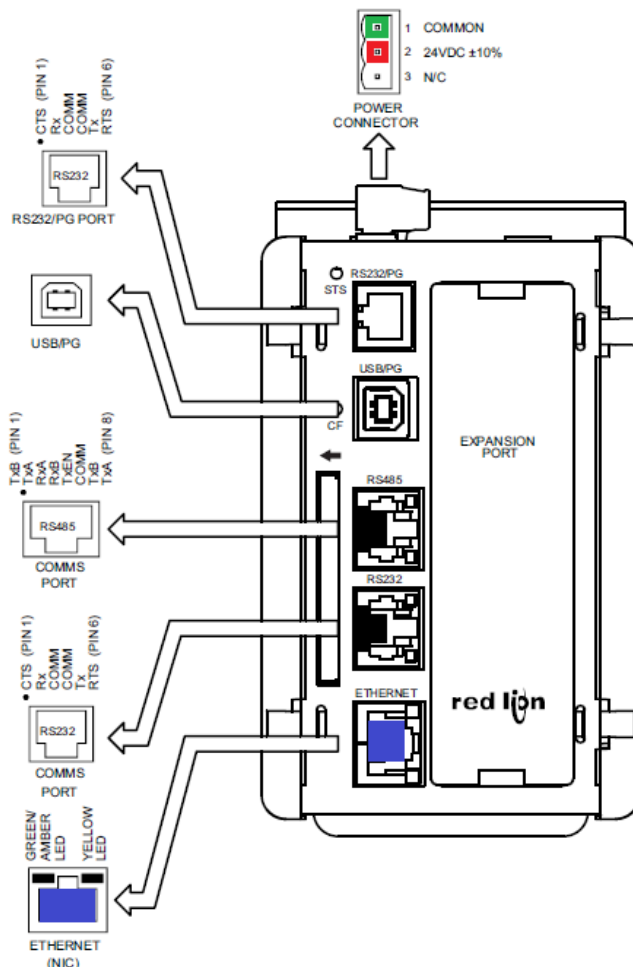
5.3 RED LION DATA COLLECTOR



The Red Lion Data Station Plus used in this system, is designed to act as a nexus for industrial data collection and management. The unit offers multiple protocol conversion, data logging and remote machine access. With three built in serial ports and a 10 Base-T/100 Base-TX Ethernet port, the unit performs protocol conversion. The Ethernet port is connect to the local Ethernet switch, described above, and communicates on the local site subnet with PLCs, HMIs, router, and modem.

The CompactFlash card allows data to be collected and stored for later review. The files are stored in simple CSV file format allowing common applications, such as Microsoft Excel and Access, to view and manage the data.

5.31 Hardware Connections



DC power connections are as shown
Green = DC Common
Red = +24 VDC

The only communications port used in this application is the Ethernet port (bottom, in Blue), which is connected to the Ethernet switch described above.



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5.32 Status Indicators

STS – STATUS LED

The green Status LED provides information regarding the state of the Data Station. This includes indication of the various stages of the start-up routine (power-up), and any errors that may occur.

Startup Routine

	INDICATION
Rapidly Flashing	Data Station is currently running the boot loader and/or being flash upgraded by Crimson.
Steady	Data Station is operating properly.

CF – COMPACTFLASH LED

LED	INDICATION
Off	No CompactFlash Card is present.
Steady	Valid CompactFlash card is present.
Flashing Rapidly	CompactFlash card is being checked.
Flickering	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive. ¹
Flashing Slowly	Incorrectly formatted CompactFlash card present.

1. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2.0 User Manual.

ETHERNET LEDS

LED	INDICATION
YELLOW (Solid)	Link Established
YELLOW (Flashing)	Network Activity
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications



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5.33 Programming and Configuration

This Red Lion DSP unit is supplied with programming and configuration done by ANGI using Red Lion Crimson® 3.0 software.

Device designation

In order to simplify and standardize programming for file processing applications, and to comply with limitations of FTP servers, etc., data groups, web pages, and data log files use a simplified device designation scheme:

C1 = Compressor 1 (C2-C5 = Compressor 2 – Compressor 5)

EPP = Priority Panel

M = Master

TF = Time Fill

D1 = Dispenser 1 (D2 – D5 = Dispenser 1 – Dispenser 5)

Fault_C1 = Fault log for compressor 1

Log_C1 = Analog trend data for compressor 1

Motor_C1 = Motor event log for compressor 1 (run/stop)

Valve_C1 = Valve event log for compressor 1

Warn_C1 = Warning log for compressor 1

5.33a Data Monitoring

The unit is configured to communicate on the local site subnet with ANGI control devices (PLCs, dispensers, etc.) and monitor system data.

Standard Compressor data monitoring points for a Horner PLC control system include:

Suction_Inlet_Pressure_Transmitter
Final_Discharge_Pressure_Transmitter
Comp_Oil_Pressure_Transmitter
Receiver_Tank_Pressure_Transmitter
Stage_1_Discharge_Pressure
Stage_2_Discharge_Pressure
Stage_3_Discharge_Pressure
Stage_4_Discharge_Pressure
Spare
Control_Air_Pressure_Transmitter
Gas_Detector_Transmitter
Low_Bank_Pressure_Transmitter
Mid_Bank_Pressure_Transmitter

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High_Bank_Pressure_Transmitter
Final_RTD_Temp_After_Cooler
Stage_1_RTD_Temperature
Stage_2_RTD_Temperature
Stage_3_RTD_Temperature
Stage_4_RTD_Temperature
Spare_AI020
Ambient_RTD_Temperature
Time_Fill_1_Pressure_Transmitter
Time_Fill_2_Pressure_Transmitter
Spare_AI024
Reserved_for_Compressor_Speed_VFD
Reserved_for_Fan_Speed_VFD
ON-OFF_Keyswitch
RESET_Keyswitch
ESD_Shutdown
Generator_Active
UPS_Active
PreLube_Motor
Fan_Motor
Comp_Motor
Receiver_Liquid_Level_High_Alarm
Oil_Level_Low_Alarm
Oil_No_Flow_Alarm_Even
Oil_Temperature_High_Alarm
Vibration_High_Alarm
Spare_Shutdown
Oil_Level_Low_Alarm_Odd
Reserved_for_Scroll_Keyswitch
HMI_RESET_HMI_Pushbutton
REMOTE_LOCAL_HMI_Selector_Switch
REMOTE_START_Master_Input
FORCE_START_HMI_Pushbutton
Run_Lamp
Fault_Lamp
Spare___Q0003
Spare___Q0004
PreLube_Motor_Run
Fan_Motor_Run
Comp_Motor_Run
Spare___Q0008

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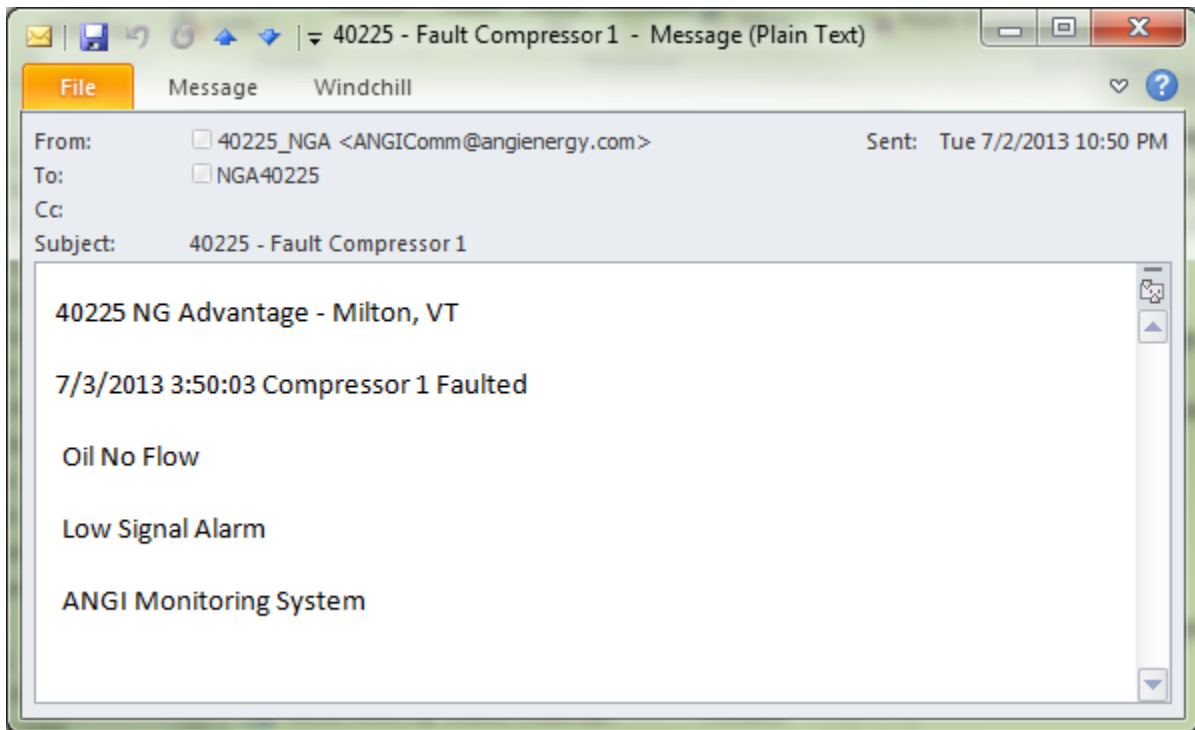
Inlet_Valve
Load_Valve
Receiver_Valve
Low_Bank_Valve
Mid_Bank_Valve
Spare___Q0014
Spare___Q0015
Spare___Q0016
Time_Fill_Valve_1_3600_psig_Hose
Time_Fill_Valve_2_3000_psig_Hose
Buffer_Valve
AlarmFlag
AlarmCode
AlarmType
WarnFlag
WarnCode
WarnType
Run_hrs
Run_mins
Standby_hrs
Standby_mins
Fault_hrs
Fault_mins
Off_hrs
Off_mins
Loaded_hrs
Loaded_mins



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5.33b Alarms, Email and Text Message

When an alarm (fault) occurs, a programmed function is triggered to compose a message that is sent via email to an ANGI distribution list. The format of message (subject line, body) can be customized to suit customer needs (location number in subject line, etc.).



The body of the message will contain any customer specified information as well as diagnostic information.

The message is sent to a distribution list address on the ANGI mail server. This distribution list will include any email (computer or phone) required by the customer.

NOTE: For this function to work properly, an internet connection with port 25 open must be connected to the router's WAN port.



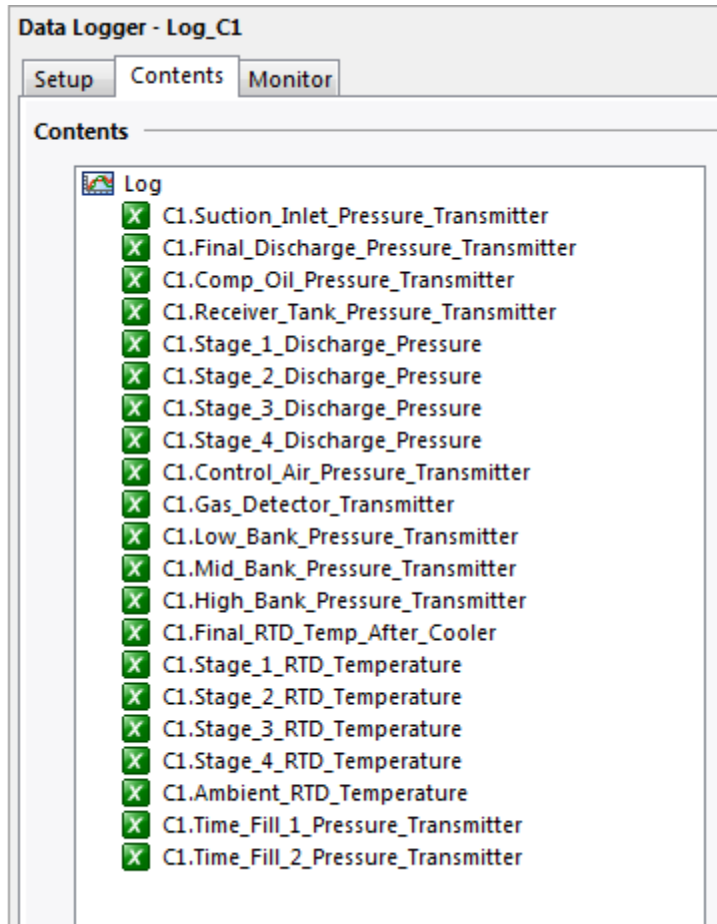
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5.33c Data Logging

The following analog data points are logged on a periodic basis (default 2 minutes) for each compressor:

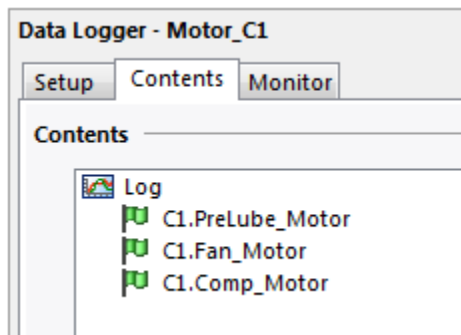


The raw data is stored in a Comma Separated Value file (.csv, Excel) for each day, in a separate folder for each compressor: log data file for Compressor 1, 10/15/2012 will be "logs\log_c1\12101500.csv". Compressor 1 uses folder Log_c1

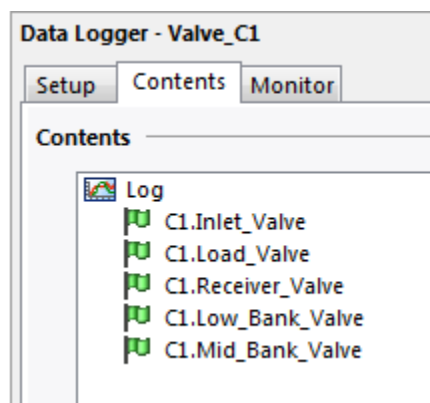
The following digital data points are logged on an event basis (state change) for each compressor:



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Output file = "logs\motor_c1\12101500.csv"

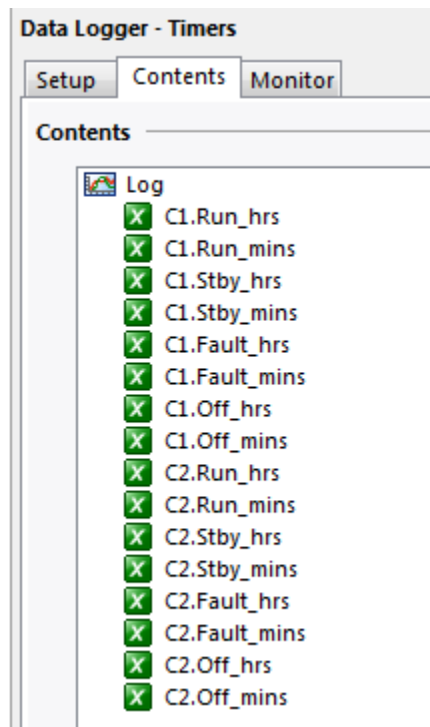


Output file = "logs\valve_c1\12101500.csv"

The following timer values are logged periodically for all compressors on site:



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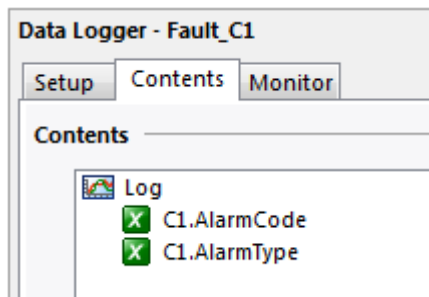


This site has two compressors. Output file = "logs\timers\12101500.csv"



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Faults are logged for each compressor on an event basis (fault occurrence):

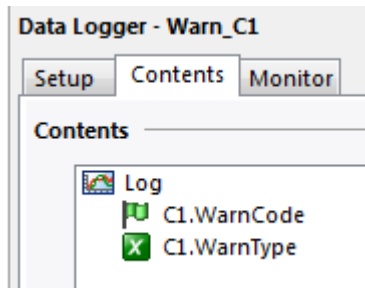


Output file = "logs\fault_c1\12101500.csv"

Typical CSV file contents (compressor 2):

Date	Time	C2.AlarmCode	C2.AlarmType
11/1/2012	8:14:57	Vibration High Alarm	Low Signal Alarm
11/1/2012	9:20:25	Vibration High Alarm	Low Signal Alarm

Warnings are logged for each compressor on an event basis (fault occurrence):



Output file = "logs\warn_c1\12101500.csv"

5.33d Log Synchronization (FTP)

The Red Lion DSP is configured to synchronize log files on a daily basis with ANGI's FTP server. In order for this function to operate properly the customer/site must provide an Internet connection via the Ethernet network connected to the WAN port of the router. This network's firewall must have Port 21 open.



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5.34 Data Website

This Red Lion DSP unit is equipped with its own limited-function webserver. In this package ANGI has supplied programming and configuration for data display Red Lion Crimson® 3.0 software, and HTML programming.

5.34a Custom Site

The starting web page is available to a web browser at address <http://192.168.10.10> on the local subnet, The external IP address will vary by site, but is the IP address assigned to the Red Lion Ethernet port either by customer NAT specification or VPN tunnel configuration.

The screenshot shows a web browser window with the address <http://172.31.160.120/>. The page displays the ANGI ENERGY SYSTEMS logo and a navigation bar with "LIVE DATA" and "LOGGED DATA" tabs. The main content area shows data for two compressors and a priority panel.

ANGI #40176 Kwik-Trip - Store 457 Oshkosh

COMPRESSOR 1 Status: STANDBY					COMPRESSOR 2 Status: STANDBY				
COMP = STOP	1st Stage	2nd Stage	3rd Stage	4th Stage	COMP = STOP	1st Stage	2nd Stage	3rd Stage	4th Stage
	PSI = 100	PSI = 104	PSI = 95	PSI = 75		PSI = 97	PSI = 97	PSI = 108	PSI = 86
	TEMP = 104	TEMP = 105	TEMP = 117	TEMP = 118		TEMP = 107	TEMP = 105	TEMP = 115	TEMP = 114
Inlet Valve = CLOSE Inlet PSI = 100					Inlet Valve = CLOSE Inlet PSI = 97				
Load Valve = CLOSE Final Discharge PSI = 4094					Load Valve = CLOSE Final Discharge PSI = 4110				
Receiver Valve = CLOSE Receiver PSI = 337					Receiver Valve = CLOSE Receiver PSI = 276				
Pre-Lube = STOP Oil PSI = 0					Pre-Lube = STOP Oil PSI = 0				
Fan = STOP					Fan = STOP				
ANGI Model NG300					ANGI Model NG300				

PRIORITY PANEL Status: RUNNING

LOW BANK	MID BANK	HIGH BANK
PSI = 3969	PSI = 4391	PSI = 4452
Valve = CLOSE	Valve = CLOSE	

This page does not refresh automatically, but can be refreshed by clicking browser refresh button.

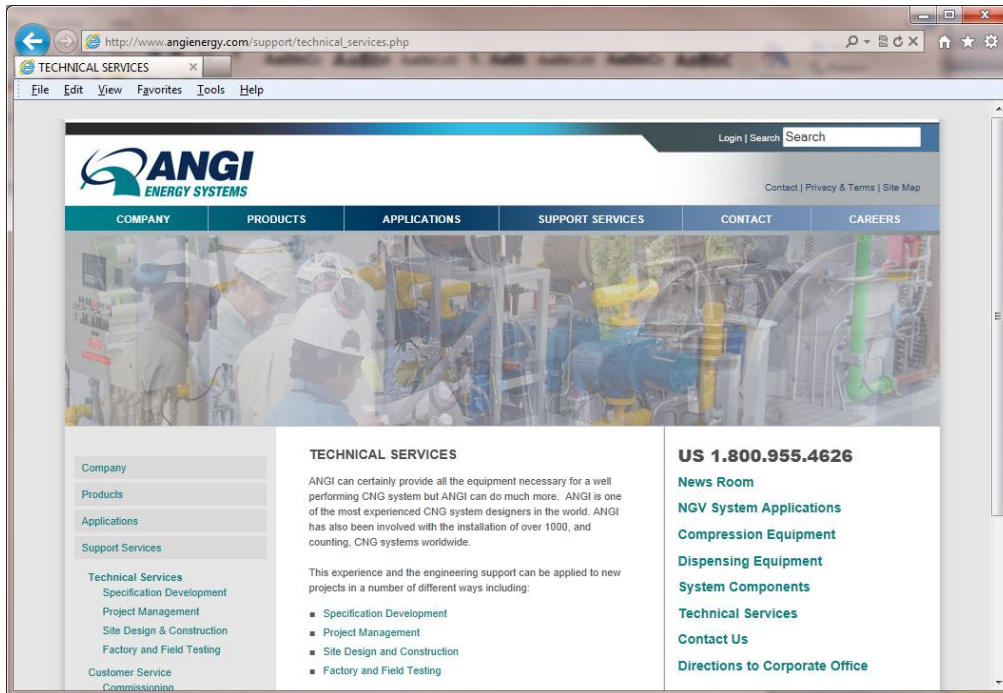
The "LIVE DATA" link connects to the Red Lion's [Data View](#) pages.

The "LOGGED DATA" link connects to the Red Lion's [Continuous Log View](#) pages.



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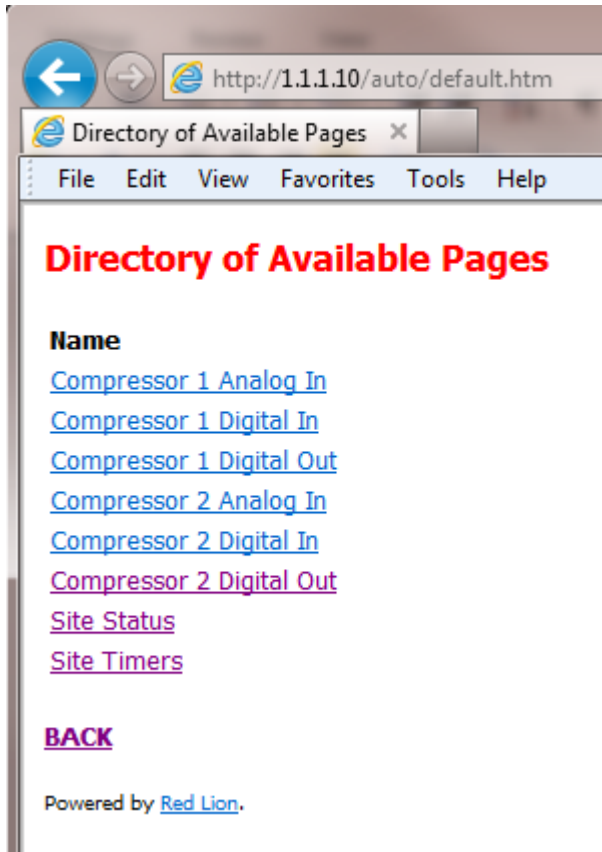
The ANGI logo in the top left is a link to ANGI's company website where additional support information can be found.





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5.34b Red Lion Live Data View pages





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Data View Pages (updated every 8 seconds)

Compressor 1 Analog In

The screenshot shows a web browser window with the address bar displaying `http://1.1.1.10/auto/001`. The browser tab is titled 'Compressor 1 Analog In'. The page has a menu bar with 'File', 'Edit', 'View', 'Favorites', 'Tools', and 'Help'. The main content area is titled 'Compressor 1 Analog In' in red. Below the title is a table with two columns: 'Name' and 'Value'. The table lists 24 different sensors and their current values. At the bottom of the page, there is a 'BACK' link and a footer that says 'Powered by Red Lion.'.

Name	Value
C1.Suction_Inlet_Pressure_Transmitter	104
C1.Final_Discharge_Pressure_Transmitter	3581
C1.Comp_Oil_Pressure_Transmitter	0
C1.Receiver_Tank_Pressure_Transmitter	223
C1.Stage_1_Discharge_Pressure	105
C1.Stage_2_Discharge_Pressure	102
C1.Stage_4_Discharge_Pressure	114
C1.Stage_3_Discharge_Pressure	109
C1.Spare	0
C1.Control_Air_Pressure_Transmitter	0
C1.Gas_Detector_Transmitter	0
C1.Low_Bank_Pressure_Transmitter	0
C1.Mid_Bank_Pressure_Transmitter	0
C1.High_Bank_Pressure_Transmitter	0
C1.Final_RTD_Temp_After_Cooler	0
C1.Stage_1_RTD_Temperature	129
C1.Stage_2_RTD_Temperature	120
C1.Stage_3_RTD_Temperature	115
C1.Stage_4_RTD_Temperature	110
C1.Spare_AI020	0
C1.Ambient_RTD_Temperature	0
C1.Time_Fill_1_Pressure_Transmitter	0
C1.Time_Fill_2_Pressure_Transmitter	0
C1.Spare_AI024	0

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Compressor 1 Digital In

Compressor 1 Digital In

Name	Value
C1.ON-OFF_Keyswitch	ON
C1.RESET_Keyswitch	OFF
C1.ESD_Shutdown	ON
C1.Generator_Active	OFF
C1.UPS_Active	OFF
C1.PreLube_Motor	STOP
C1.Fan_Motor	STOP
C1.Comp_Motor	STOP
C1.Receiver_Liquid_Level_High_Alarm	ON
C1.Oil_Level_Low_Alarm	ON
C1.Oil_No_Flow_Alarm_Even	OFF
C1.Oil_Temperature_High_Alarm	ON
C1.Vibration_High_Alarm	ON
C1.Spare_Shutdown	OFF
C1.Oil_Level_Low_Alarm_Odd	OFF
C1.Reserved_for_Scroll_Keyswitch	OFF
C1.HMI_RESET_HMI_Pushbutton	OFF
C1.REMOTE_LOCAL_HMI_Selector_Switch	ON
C1.REMOTE_START_Master_Input	OFF
C1.FORCE_START_HMI_Pushbutton	OFF

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Compressor 1 Digital Out

Compressor 1 Digital Out

Name	Value
C1.Run_Lamp	OFF
C1.Fault_Lamp	OFF
C1.Spare___Q0003	OFF
C1.Spare___Q0004	OFF
C1.PreLube_Motor_Run	OFF
C1.Fan_Motor_Run	OFF
C1.Comp_Motor_Run	OFF
C1.Spare___Q0008	OFF
C1.Inlet_Valve	CLOSE
C1.Load_Valve	CLOSE
C1.Receiver_Valve	CLOSE
C1.Low_Bank_Valve	CLOSE
C1.Mid_Bank_Valve	CLOSE
C1.Spare___Q0014	OFF
C1.Spare___Q0015	OFF
C1.Spare___Q0016	OFF
C1.Time_Fill_Valve_1_3600_psig_Hose	OFF
C1.Time_Fill_Valve_2_3000_psig_Hose	OFF
C1.Buffer_Valve	CLOSE

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Site Status

Site Status

Name	Value
C1.Status	STANDBY
C1.AlarmFlag	OFF
C1.AlarmCode	No Alarms
C1.AlarmType	None
C1.WarnFlag	OFF
C1.WarnCode	None
C1.WarnType	None
C2.Status	STANDBY
C2.AlarmFlag	OFF
C2.AlarmCode	No Alarms
C2.AlarmType	None
C2.WarnFlag	OFF
C2.WarnCode	None
C2.WarnType	None
EPP.Status	RUNNING
EPP.AlarmFlag	OFF
EPP.AlarmCode	No Alarms
EPP.AlarmType	None
EPP.WarnFlag	OFF
EPP.WarnCode	AI003 High Bank Pressure
EPP.WarnType	None

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Site Timers

A screenshot of a web browser displaying the mGuard (mguard) interface. The browser's address bar shows the URL http://172.31.253.114. The page title is "mGuard (mguard)". The interface has a menu bar with "File", "Edit", "View", "Favorites", and "Tools". The main content area is titled "Site Timers" in red. Below the title is a table with two columns: "Name" and "Value". The table lists various timer values for two units, C1 and C2. At the bottom of the page, there is a "BACK" link in purple and a footer that says "Powered by Red Lion.".

Name	Value
C1.Run_hrs	45
C1.Run_mins	43
C1.Stby_hrs	9520
C1.Stby_mins	25
C1.Fault_hrs	960
C1.Fault_mins	54
C1.Off_hrs	50
C1.Off_mins	14
C1.Loaded_hrs	39
C1.Loaded_mins	41
C2.Run_hrs	45
C2.Run_mins	46
C2.Stby_hrs	9586
C2.Stby_mins	41
C2.Fault_hrs	653
C2.Fault_mins	26
C2.Off_hrs	297
C2.Off_mins	39
C2.Loaded_hrs	39
C2.Loaded_mins	17

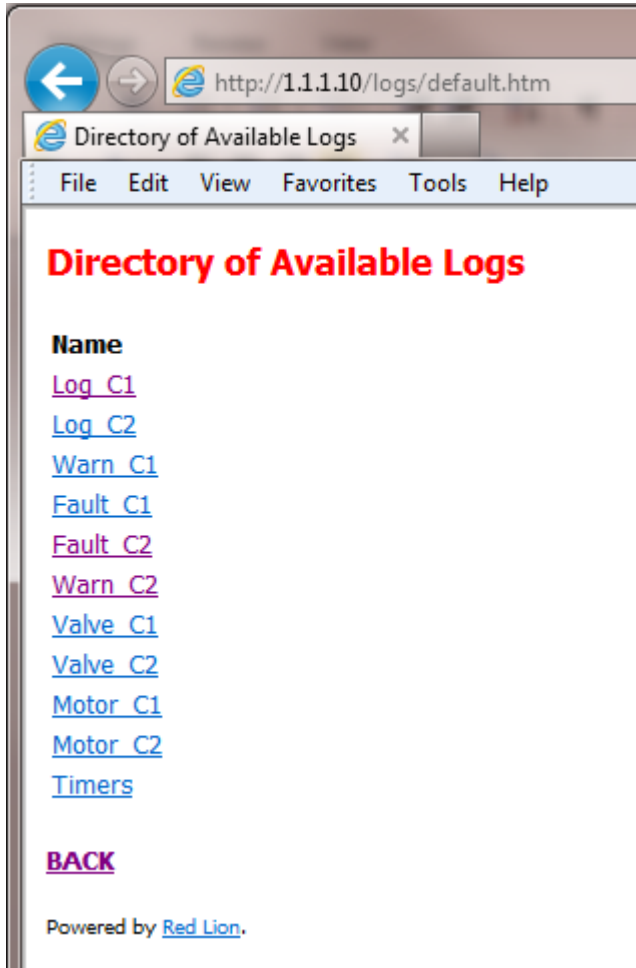
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5.34c Red Lion Continuous Log Data View pages



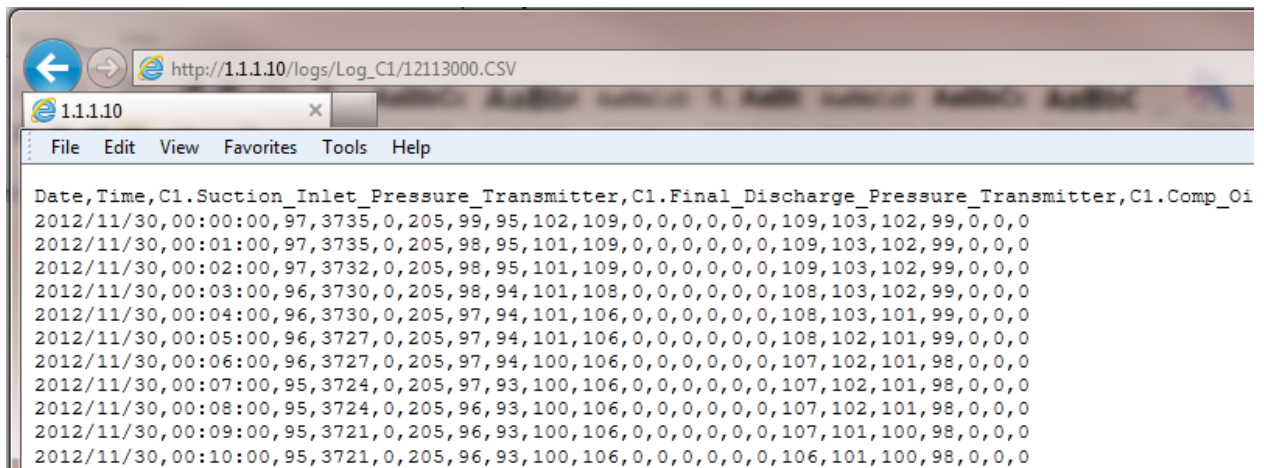
The selections will display a selection list of the current log files in memory for that log set, 7 days' worth of logs are stored in the unit. "Log_C1" displays as follows:



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Selecting one of the log files will display the raw data:



The top line is the data column names, subsequent lines are comma-separated data. This file can be directly displayed in Excel after download.

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6. DATA COLLECTION

6.1 Log Files

As stated above, log files (.CSV format – comma separated values) are synchronized between the site's Red Lion DSP and ANGI's FTP server on a periodic basis. The files are stored in a long-term archive at ANGI. Their data is will be extracted into a database.

6.3 Database

Log file data is extracted, formatted, and inserted into data tables in a SQL Server database.

6.3 Data Analysis Examples

Data stored in the database can be analyzed and presented as reports. Reports supplied to the customer are optional and under development at this time.



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