ANASCAN
User's Guide

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Please Note: External safety devices must be used with this equipment.

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Overview

This manual describes how to install, setup, and operate ANASCAN. ANASCAN is a DOS-based software program that allows you to program and monitor multiple CAS and CAS200 scanners from a single PC. Hereafter, both the CAS and CAS200 scanners are referred to as CAS scanners.

Using This Guide

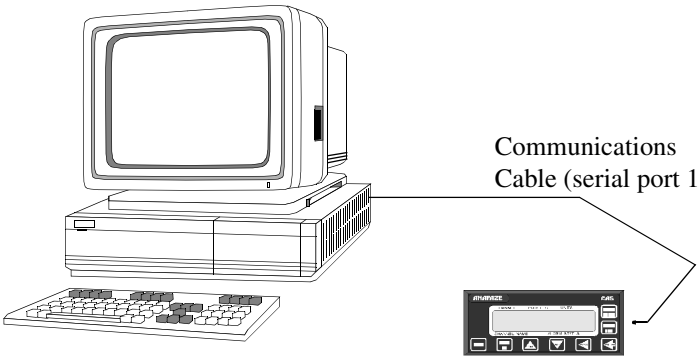
This guide is intended for both experienced and inexperienced users. Experienced users may find some parts of this guide very simplistic; if that's you, please at least skim these parts to make sure you don't miss anything vital. If you're an inexperienced user, please read this guide carefully.

The following describes each section.

- **Introduction:** Describes ANASCAN and its computer requirements.
- **Installation:** Covers how to install and setup ANASCAN.
- **Startup:** Describes program loading and startup errors.
- **General Screen Displays:** Provides an overview of the screen and typical screen responses.
- **Channel Overview:** Describes the channel overview screen.
- **Edit:** Describes the edit screen.
- **Channel Setup:** Gives an overview of the channel setup screen. Included are descriptions of system parameters.
- **System Setup:** Describes the system setup screen.
- **Job Setup:** Describes the job setup screen.
- **View Alarms:** Describes alarms and how to view them.
- **Trend Plot:** Covers trend plotting and reviewing trend plots.
- **Appendix:** Describes input scaling examples.

System Block Diagram

The following shows how the PC interface (with ANASCAN) to several units.



Parts List

The following parts are included with ANASCAN.

- ANASCAN on 3.5 inch Diskette. (5.25 in diskettes are available upon request)
- RS-232 or RS-485 communications cable

Safety

Watlow Anafaze has made efforts to ensure the reliability and safety of ANASCAN. Note that in any application failures can occur.

Good engineering practices, electrical codes, and insurance regulations require that you use independent external safety devices to prevent potentially dangerous or unsafe conditions. Assume that ANASCAN can fail or that other unexpected conditions can occur.

For additional process safety, program a computer or other host device to automatically reload your desired operating parameters after a power failure. However, this safety feature does not eliminate the need for other external, independent safety devices in dangerous conditions.

In the event of a CAS reset, ANASCAN will reload the unit with the current values in computer memory. The user must ensure that this reset will be safe for the process. Use of ANASCAN does not eliminate the need for appropriate external, independent safety devices.

Please contact Watlow Anafaze immediately if you have questions about system safety.

INTRODUCTION

ANASCAN is a user friendly, menu driven software package. It interfaces the Compact Alarm Scanner (CAS) system to monitor inputs and alarms for up to 16 independent channels.

You may have only one CAS or a plant wide system with numerous units. ANASCAN includes numeric and graphic displays, data and alarm printing, data and alarm logging in text or LOTUS compatible files, and graphic trending. It runs on an IBM AT 286, 386, or 486, and true compatible computers. A question and answer format enables users to quickly define and setup any measurement or application.

NOTE

ANASCAN is sold with a license agreement and can be operated only on one computer. The license agreement requires registration with Watlow Anafaze. Watlow Anafaze will send updates at no charge only to registered users. See registration form at the end of this manual.

ANASCAN Features

ANASCAN provides these features:

- Process overview screens
- Channel setup screen, individual channel parameters editing
- Maintaining a directory of job files
- Displaying and logging process variable alarms
- Password protection for various levels of program
- Software grouping of Channels
- Graphic trend plotting of process variabilities points and output values in real time
- Definable startup sequences
- Power failure recovery
- Printer and disk data and alarm logging

Computer Requirements

Watlow Anafaze sets these computer requirements for running ANASCAN:

1. IBM AT 286, 386, 486 or other IBM Compatible Computer
2. DOS Version 3.3 or higher
3. Speed: 25 MHz or higher
   This speed provides the best performance of the ANASCAN program; it enhances the response of the system to changes and maintains the best screen updates. However, it is not a factor in the performance of the system since this is maintained independently in each Watlow Anafaze controller.
4. Memory: 580K bytes free memory or larger
5. Disk Drives: One 40MB hard disk. One 5.25” and/or 3.5” floppy disk
6. Graphics Interface: EGA/VGA
7. RS-232 or RS-485 Serial Interface

   The serial communication link required to communicate with more than one CAS or with a communication cable longer than 50 feet is RS-485. Watlow Anafaze recommends using the standard serial interface of RS-232 with an external RS-485 converter.

   A converter recommended by Watlow Anafaze is the B&B Electronics RS-232/RS-485 optically isolated converter P/N 485OIC. This converter has screw terminals for connecting the RS-485 wires and the DB-25 Male connector for the RS-232 side.

   Other recommendations are the Black Box RS-232/RS-485 non-isolated converter P/N ME-836A. The ME-836A connections are the same except the terminals are labeled with an X instead of a D. The converter is used for both 2-wire/4-wire systems.

   To provide optical isolation, the addition of Black Box opto-isolator P/N SP400A is highly recommended. The SP400A will normally use the factory DIP switch settings. All that needs to be done is to connect the cable and the power supply. The SP400A has been used without any power supplies required as it will draw its power from the computer and the ME-836A. Always use equipment manufacture factory recommendations.

   To use a PC internal mounted RS-485 card, the Black Box Corp. P/N IC030 has been used successfully in Watlow Anafaze installations. Caution must be taken when other communication devices are installed so as not to conflict with the address or interrupt.

   Another PC internal optically isolated RS-485 serial card is BB Electronics model # 3PX0CC1A.

8. Printer Parallel Interface
   The printer parallel interface port is required for the Watlow Anafaze software key. The Watlow Anafaze software key must be installed on the printer port. System operation of the CAS is not possible without the software key. [See Software key installation].
9. Battery backed up real time clock (usually battery backed CMOS chip)
10. EGA/VGA Monitor
    The EGA interface card will allow color trend plotting even with a CGA monitor. The EGA/VGA monitor used with the EGA/VGA interface provides improved text displays making all the screens easier to read. For systems that require frequent operator changes and frequent observation, full EGA or VGA is recommended.
11. IBM Graphics Compatible Printer
    This graphics printer is required for printing data and alarm logging features of ANASCAN.

INSTALLATION

Quick Installation

- Create a directory on your hard disk and change to that directory.
- Type A:\ANASCAN2. The file will self-extract into the directory.
- Type SCANINST from your ANASCAN directory (If you copied the file to the hard disk. If you didn't, type the appropriate drive).
- Press Enter. Installation menu appears.
- Change inputs in the installation menu by moving the cursor to the desired parameters.
- You are ready for start up.

WARNING

It is your responsibility to ensure that the entire system is safe. Read the warning in the front of this manual. If there is any possibility of an unsafe condition, use independent safety devices.

ANASCAN Files

ANASCAN2.EXE - a self extracting program that contains the program files.

SCANINST.EXE - ANASCAN installation program

ANASCAN.EXE - a file that contains the main program software.

Support files:

INSTAL.DAT - installation parameters data file

LPGRP.DAT - channel grouping start up data file

SYSSU.DAT - system setup data file

STATUS.DAT - system start up status file

DIGIO.DAT - digital I/O screen data

DLOG.DAT - data logging data file

GRPINFO.DAT - group set up data file

HDR.WK1 - Lotus header set up file

PLOT.DAT - plot parameters data file

Files created by ANASCAN:

XXXXXXXX.J## - group job directory data file

NEWXX.PLT - plot files which were created within the last 24 hours.

OLDXX.PLT - older plot files

PXXXXXXX.TXT or WK1 process logging files

AXXXXXXX.TXT or WK1 alarm logging files

WARNING

Make copies of disks before running the program, and store the original ANASCAN disks in a safe place. Use the copies to operate the system.

File Locations

360k dual floppy disk system:

Watlow Anafaze recommends that you store the ANASCAN operating program file and the INSTAL.DAT file on drive A, and all other files on drive B. Once the program SCANINST is run, you can remove SCANINST.EXE from drive B to allow more room for data. **Do not remove files from the master disk.** This recommendation ensures that the autoboot feature will bring up the program automatically in the occurance of a power outage.

720k or higher floppy disk system:

Watlow Anafaze recommends that you store all files of the ANASCAN operating program on one drive such as A. Use the B drive to store all recording data by setting up directories as shown in the hard disk system recommendations.

Hard disk systems:

Watlow Anafaze recommends setting up directories as follows:

ANASCAN - to contain the operating program, system data and job files

DATALOG - to contain data logging files generated by ANASCAN

ALARMLOG - to contain alarm logging files generated by ANASCAN

For easy removal of recorded data, you may install the DATALOG and ALARMLOG directories on the A or B floppy drives. For automatic reboot use the B drive recording data to the floppy.

Copy all the supplied files to the ANASCAN directory.

Installation Program

The installation program, SCANINST.EXE, customizes each ANASCAN program for the application. When typing C:SCANINST (if it's on the hard disk), or B:SCANINST (if it's on drive B), The installation screen appears and enables you to select parameters used by ANASCAN.

SCANINST.EXE stores the program setup parameters in a file called INSTAL.DAT. When run, the SCANINST program reads the INSTAL.DAT file from the default disk directory. If both files are on the same disk directory, enter the directory and type SCANINST.

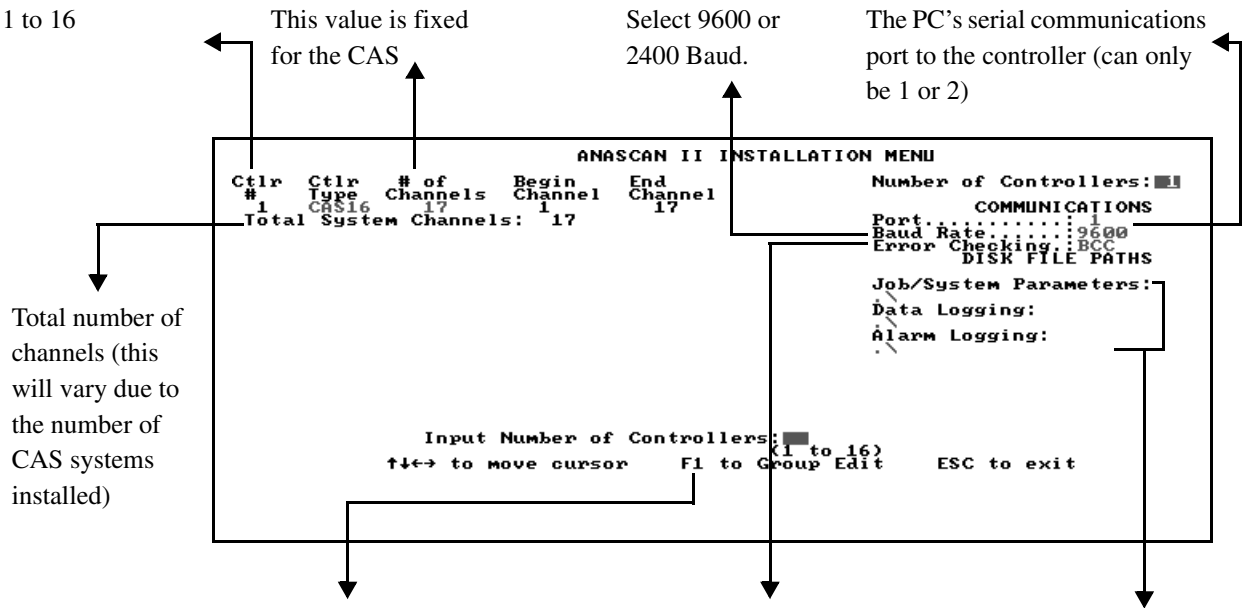
If the SCANINST.EXE and INSTAL.DAT file are on different directories, enter the disk directory containing INSTAL.DAT and type SCANINST preceded by the path to the disk directory containing SCANINST. For example, if INSTAL.DAT is on drive A and SCANINST.EXE on drive B, type :

B:>A: [Enter] to change the current default drive to A

A:>B:SCANINST [Enter] to start the installation program

If the installation program cannot find INSTAL.DAT, an error message appears. Verify the location of INSTAL.DAT file.

Installation Menu



Number of channels

ANASCAN displays 16 channels with system numbers. The system channel numbers associated with the CAS channels are indicated in the installation program as the Begin Channel and End Channel for each scanner. A 17th channel is reserved for pulse monitoring.

Directory Paths

Job/Parameters path

This is the path to the disk directory containing the Job and System Parameters Data Files. The path would normally be:

B:\ANASCAN\ or .\ current directory (If the system files are on drive B)

C:\ANASCAN\ or .\ current directory (If the system files are on the hard disk). Notice that the last "\" is added automatically.

Data logging path

This is the path to the disk directory containing the LOTUS or text [ASCII] data logging files generated by ANASCAN. This directory must exist before running ANASCAN and turning on data logging.

B:\ANASCAN\DATALOG\ (for floppy disks)

C:\ANASCAN\DATALOG\ or.\DATALOG\ (for hard disks). Notice that the last "\" is added automatically.

Alarm logging path

This is the path to the disk directory containing the LOTUS or Text (ASCII) alarm record files generated by ANASCAN. This directory must exist before running ANASCAN and turning On alarm logging.

B:\ANASCAN\ALARMLOG\ (for floppy disks)

C:\ANASCAN\ALARMLOG\ or .\ALARMLOG\ (for hard disks). Notice that the last "\" is added automatically.

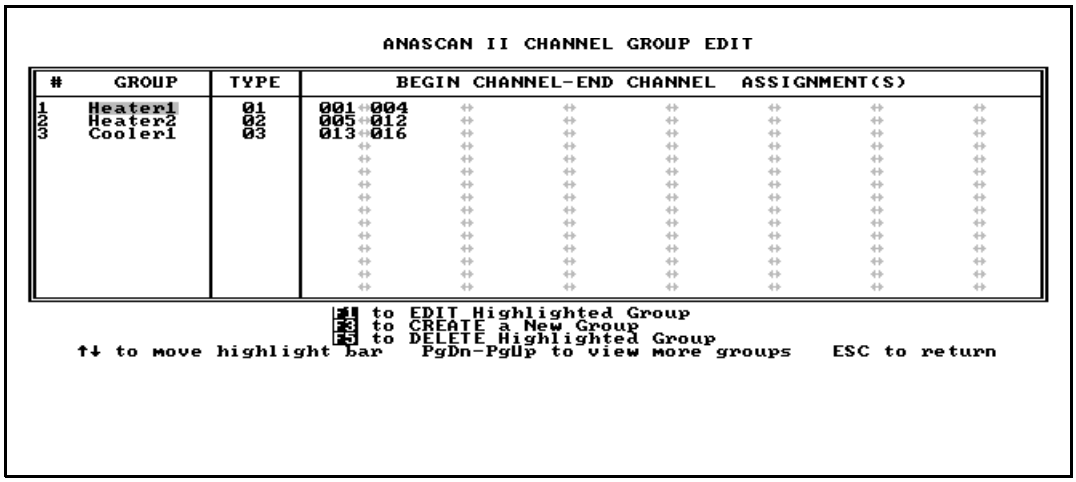
Grouping Channels

Grouping inputs allows you to divide your system into subsystems. You can group channels with a common purpose according to your specific application requirements. One group might be for a furnace or a group of furnaces; another group might be for common Jobs shared between devices.

Only the channels of one group are displayed on the Overview screen at a time. The job parameters are uploaded or downloaded to an individual group independently. The number of controllers with their total number of channels must match the number of channels in the grouping. The channel numbering depends upon the type of input selected in the SCANINST program.

After assigning the channel numbers to a group, select a type number of two digits up to 99. This number is the job directory number for the group and its channels. All groups with the same type number will be assigned to the same job directory. Creating a new type number creates a new job directory number in the ANASCAN program.

Group menu



General grouping rules

- Create a group when you need to have the channels on the same Overview screen.
- Assign the channels to the group you want to have on the same Overview screen.
- Create a type number for the new group. This type number can be assigned to more than one group if they share common jobs through the ANASCAN.EXE program. However, **when using the same type number for groups, the number of channels must match. Otherwise a new type number must be used.**

NOTE

Type value is used to store jobs specific for that type. The Default job is only stored under type 01.

START UP

Quick Start Up

- Ensure time and date are correct in your computer.
- Type: ANASCAN. Job Select screen appears.
- Type a job's name. When starting the first time, enter DEFAULT.
- Type D for downloading parameters to the CAS, or U for uploading. For initial testing in the Edit mode, enter D.
- Overview screen appears.

Start Up Optional Modes

You can start ANASCAN in certain modes by adding parameters to the command at start up. These command line options include:

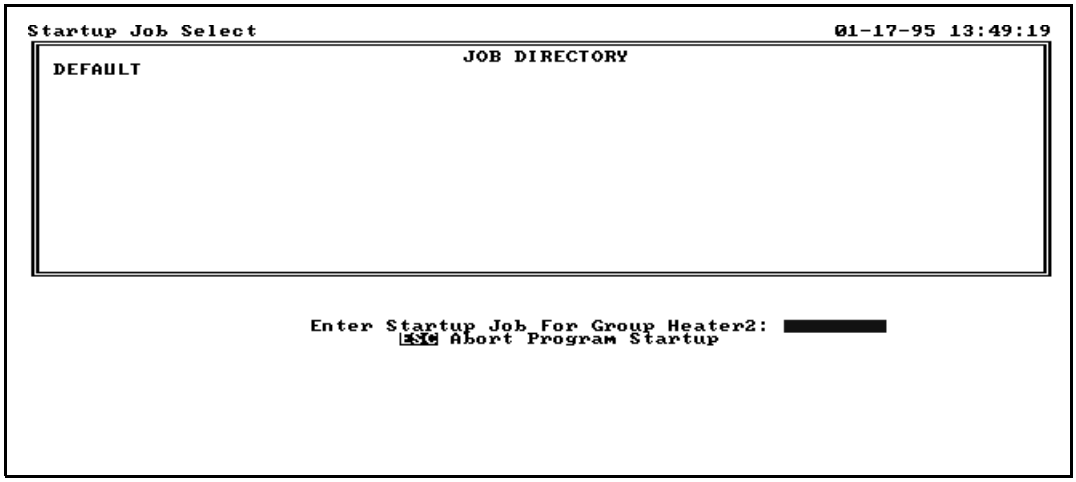
- **/e**
  Operates the program in Edit mode. The program operates normally but it does not communicate with the CAS. You can operate the program in Edit mode without any hardware connected to the computer. This mode is useful for initial familiarization, training, and Off Line job editing.
- **/c**
  Forces the graphics display into CGA mode. This is necessary on some computers which are not truly IBM compatible.
- **/d**
  Operates the program in the Debug mode. This is useful in debugging communications problems. Don't use it for normal operations. All communications between the computer and the CAS are displayed on the printer. Therefore, in order to use this mode, the printer must be connected and ready.

You can use capital or small letters in the command line, and more than one command line option at a time. For example:

Typing ANASCAN /E /C [enter] will operate the program in Edit mode with CGA graphics.

Start Up Sequence

- The program checks the computer system hardware and the access to the system disk files.
- The program verifies communications to each CAS in the system and their versions.
- Job Directory screen appears.



- The program prompts for the job to run. ANASCAN program is supplied with a job named DEFAULT which contains all the default parameters and setups. When starting the first time, enter the job name DEFAULT.

WARNING

When the CAS is monitoring, upload to install parameters into the ANASCAN operating program. Downloading will install factory default values. For Initial testing in the Edit mode, enter Download.

- After the downloading sequence is complete, the program displays the Overview screen. If there is a problem in the program start up, see *start up errors* in this section.

Default Start Up Values

The program is shipped to you containing several parameters which are set to initial factory default values. These should be set to desired values by supervisory personal, and they include:

- Passwords
- Program startup sequences
- Data logging parameters
- Trend plotting parameters

See *System Setup* for detailed information.

Start Up Errors

During Start up, various error messages may appear. The following tables describe these messages, their causes and solutions.

Memory allocation errors

ANASCAN allocates computer memory for the channel parameters, based on the number of channels and options in the system. When ANASCAN reads in the system data files and finds there isn't sufficient memory, these messages may appear:

Message	Cause	Solution
Insufficient Memory	Not enough memory to allocate data arrays required to run the program. The program cannot run and it terminates.	• Check the memory by running the DOS command CHKDSK. At least 580K should be free. • Make sure your computer has 640K memory, and remove any memory resident programs and drivers. Check AUTOEXEC.BAT file to see if it runs any memory resident programs. After removing these programs, re-boot the computer.
MEM ERROR: Alarm Queue	Not enough memory to allocate the alarm log memory. The program operates, but the view alarms screen doesn't display alarm queue.	Same as above.
Trend Logging Disabled	Not enough memory to allocate some or all of the trend logging memory queues. The program operates normally, but the trend plotting is not available.	Same as above.

Disk file errors

While reading in the system files, several reading errors can occur. The system files are SYSSU.DAT, INSTAL.DAT, and PLOT.DAT. ANASCAN cannot run without these files.

Message	Cause	Solution
ERROR WHILE READING DATA FILE: xxxxxxxI FILE NOT FOUND	The system file does not exist on the indicated disk and directory path.	The INSTAL.DAT file should be on the default drive and directory. The other system files should be on the data file drive and directory path as set in the installation program. If these files are not in the right directories, copy the system files from the backup disks to the appropriate directories.
ERROR WHILE READING DATA FILE:xxxxxxx Drive not ready Read fault General failure or Access failure	There is a disk drive hardware access failure.	Run CHKDSK or other diagnostic program in order to verify that there is no disk drive error. For a floppy drive: make sure that there is a disk in the right drive and that the drive door is closed.
ERROR WHILE READING DATA FILE:xxxxxxx Path not valid or Invalid disk drive	The data disk path that you set in the SCANINST installation program is not valid.	Run SCANINST and verify that the drive and directory path exist and are valid. Don't forget to verify that "\" is at the end of the path entry.
INVALID DATA FOUND ON DATA FILE:xxxxxxx	There is corrupted or invalid data in the disk file.	Copy the original data file sent with ANASCAN from the backup disks.

Extended start up sequence errors

ANASCAN reads in the status file STATUS.DAT which contains information saved by ANASCAN the last time it was running. Several errors can occur when reading this file.

Message	Cause	Program Action	Solution
Could not find STATUS.DAT start up file	The file could not be found on the data file disk directory set by SCANINST. The file may have been erased or corrupted.	ANASCAN continues with the start up, but since there is no power failure information available, ANASCAN assumes the Over Power Failure Recovery time Limit action and starts in that mode.	As the program is running, the STATUS.DAT file will be established. Therefore, subsequent starts should have no problem.
Invalid data value on STATUS.DAT start up file	The file contains some invalid data, and ANASCAN assumes that the file was corrupted.	Same as above.	Same as above
Power Failure Recovery System clock Error	The current system time/ date as saved in the STATUS.DAT file were not in a valid range. The computer system clock is not set to valid time and date.	Same as above.	The automatic power failure recovery feature of ANASCAN requires a correct clock/calendar system. While the computer boots up, verify the following: • There is a battery backed up clock/calendar in the system. • The battery is good. • Time and date values are correctly loaded.

Communications problems

Message	Cause	Solution
Failed Communications to CAS Abort start up (Y/N):	ANASCAN cannot communicate with one of the CAS during the initial system communications check or during the job downloading/uploading.	• Verify that the communications port set in ANAINSTL is the one actually connected to the CAS. • Verify that the communications parameters (baud rate and error checking mode) set in the installation program are those set in the CAS. The CAS communications parameters are set using the front panel keys while in the GLOBAL menu. • Verify that the address of each CAS is unique (for multiple CAS systems). • Verify that the correct version of ANASCAN is running for the CAS being used. • Verify that the wiring is done correctly to the CAS and the computer.

NOTE

See the respective CAS hardware manual for assistance in checking the communication parameters and verifying the communication wiring.

- If there is more than one CAS in the system, ANASCAN will try supervising those CAS which are operating and communicating correctly. After start up ANASCAN periodically re-checks communications to the failed CAS.
- By continuing the start up, the CAS not communicating will be listed by address on the System Errors window in the System Setup screen. Check the unit listed on the screen. Be sure the address is correct as set on the CAS.

EPROM version error

ANASCAN checks the CAS EPROM version at start up and verifies that it's acceptable to the version of ANASCAN. The following message may appear:

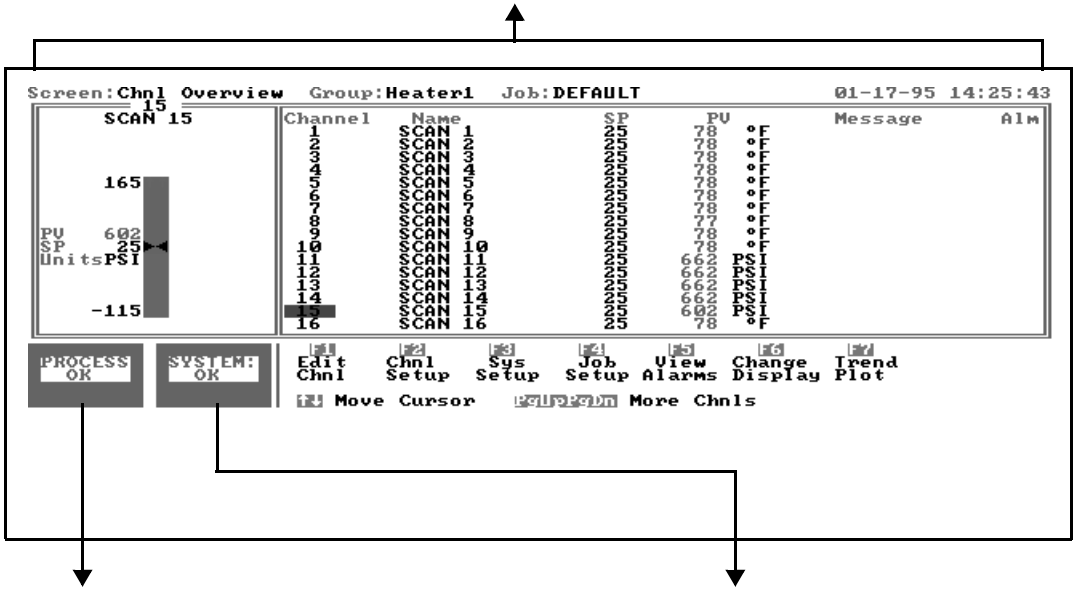
Message	Cause	Solution
Unacceptable CAS EPROM version	The EPROM version is not acceptable to the version of ANASCAN.	Contact Watlow Anafaze to obtain EPROM upgrade

.

GENERAL SCREEN DISPLAYS

Certain characteristics are maintained on all ANASCAN screens as follows:

Title line. Includes screen's name, current channel and job, and the time and date. When in Edit mode, "Edit Mode" will appear at this location.



Process status box. Four possible messages:

1. Process OK (green).

2. Process warning (yellow). there is a warning on at least one channel.

3. Process alarm (blinking red). An alarm condition on at least one channel has not been acknowledged.

4. Process alarm (red). An alarm condition on at least one channel. All alarms have been acknowledged.

System status box. Reports problems of communications, printer access, or data logging disk access. Two possible messages:

1. System OK

2. In case of a problem, the appropriate message (red).

Changing Data

- Use the cursor to enter data in the editing screens.
- Move the cursor to the variable you want to change. An editing prompt appears at the bottom of the screen with a blue background new value box. The allowable range of the variable is listed below the new value box.
- Type the new desired value into the new value box.
- Press Enter. The new value will be displayed over the original one, and will be downloaded to the CAS. If you made a mistake in entering the value and have not pressed Enter yet, use the backspace key to correct.
- Use the F4 Key to enter the Job Setup screen and save the changes. If you don't, upon a new start up, the Job data file will be read from the disk along with the old parameter.

NOTE

A value you enter may be slow to change due to computer processing time or communications delays. If a value you entered is not accepted or changes back after entry it may be that the value is not in the range for the parameter or not acceptable in the present mode or circumstances.

Print Screen

- You can print all ANASCAN screens on an IBM graphics compatible dot matrix printer.
- Use the PRTSC key. When the print screen is initiated, the copy of the current screen is transferred to a buffer and the screen will be printed as a background task. The program continues operating and you can display other screens while printing a screen.
- When printing the Trend Plot screen, you will be asked for a title before printing the screen.

CHANNEL OVERVIEW

The Channel Overview screen provides an overview of the process information. It is not password protected and is available at all times for anyone who wishes to monitor the process variables.

Getting Here

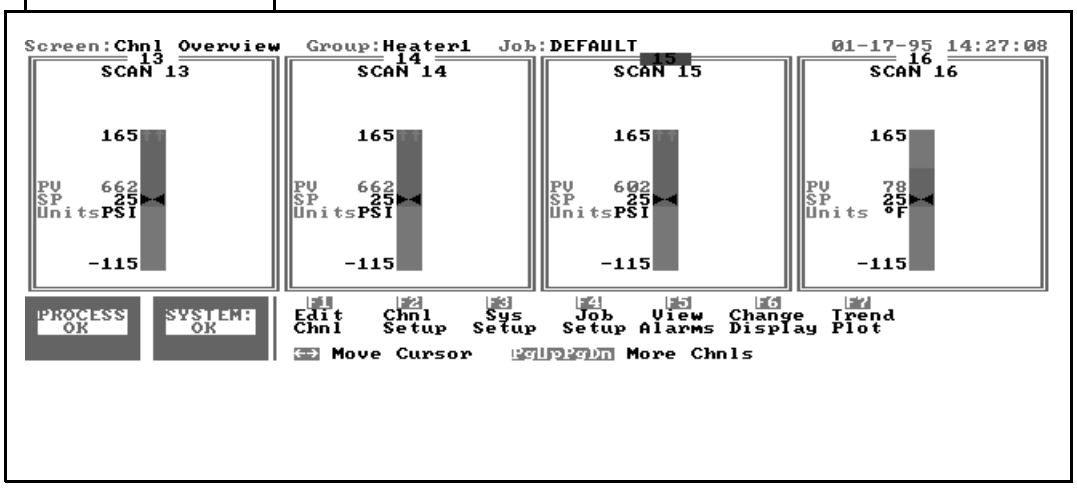
This screen appears automatically after start up.

Options

The Overview screen has four display screens. Use the F6 key to switch between displays.

1. Four-channel graph display. Each channel includes a range of parameters.

Single channel display *

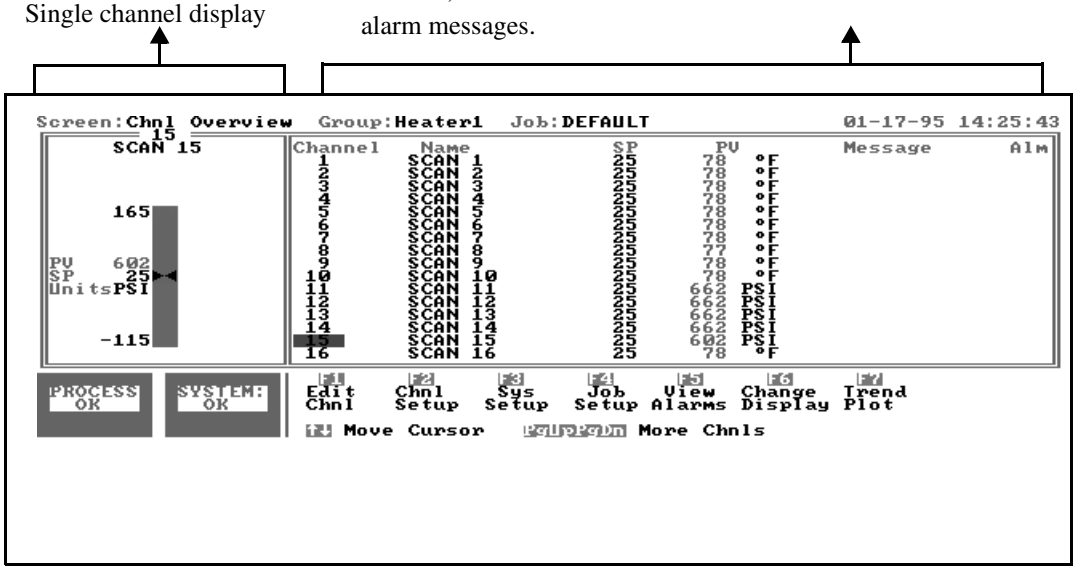


* The single channel display includes the channel name, setpoint, process variable, alarm messages, warning and alarm setpoints.

2. 16 channel display in a channel table with 7 channel parameters. 1 selectable channel CAS face plate.

Channel table. A list of 16 channels includes the setpoint, process variable, and alarm condition. It also includes channel names and alarm messages.

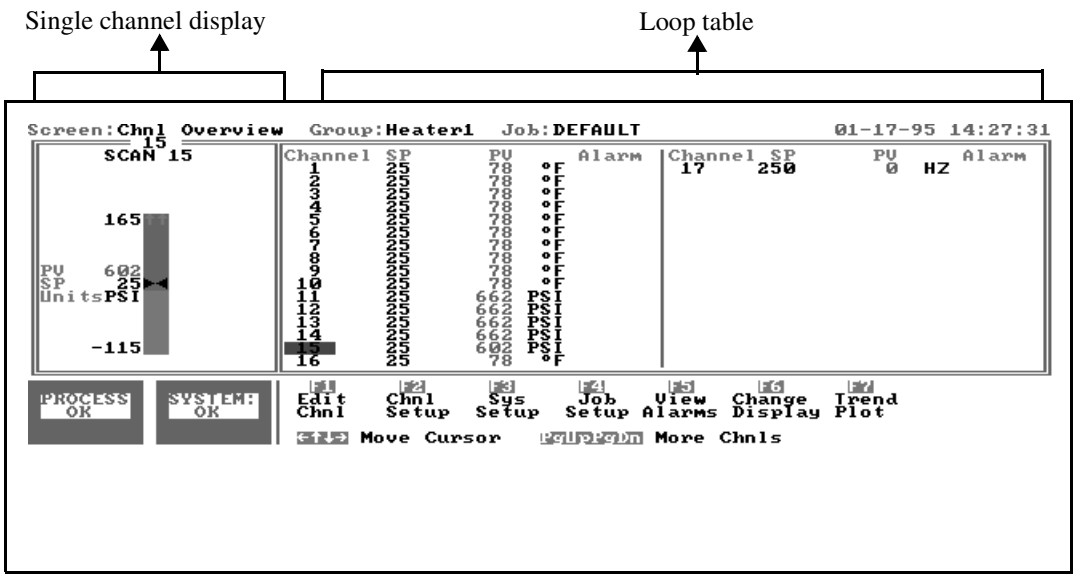
Single channel display



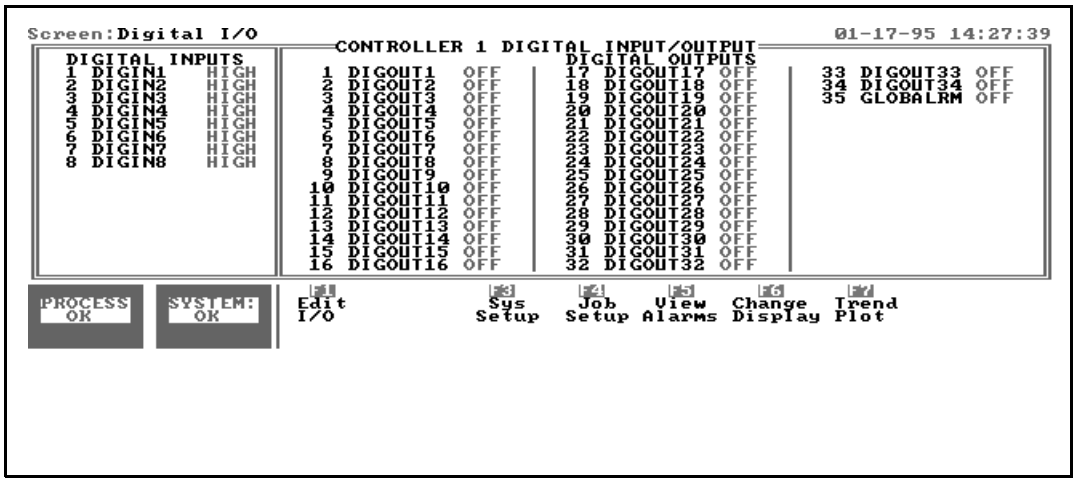
3. 32 channel display in a channel table with 4 Channel parameters. 1 selectable channel CAS face plate.

Single channel display

Loop table



4. Digital I/O screen. This screen shows the status of your digital inputs and outputs.



Function Keys

For an easy access from the Overview screen to all other screens, use the function keys as shown below:

Key	Function
TAB	Change group. Switch to a new group in any screen. You don't need to go back to Overview screen.
F1	Edit screen. Change setpoint.
F2	Channel Setup screen. Display and edit all channel parameters.
F3	System Setup screen. Display and edit various system parameters (passwords, disk and printer data logging, start up, etc.)
F4	Job Setup screen. Select, save and delete jobs.
F5	View alarms. Display on-screen alarm log. System Setup allows selecting automatic switching to this screen in case of an alarm.
F6	Switch displays. Change the Overview screen display to one of its 4 options.
F7	Trend logging. Display the graphic trend plot.

- Press ESC to view the next Group Overview screen. If you wish to view another group, move the cursor to that group and press ESC.
- If not all the channels are visible (in a large system), use the PgUp/ PgDn keys to view the other channels.
- The Overview screen is automatically updated as data is collected from the CAS. Measured data is displayed in engineering units.

- Normal readings are **green**, warnings are **yellow**, and alarms are **red**.
- If you edit the CAS at its front panel, the program displays the word "locked" in the single channel Face plate and puts the letter "L" beside the process variable in the Channel Table for the channels on the edited CAS. Once the front panel editing is complete, the display returns to normal.

EDIT

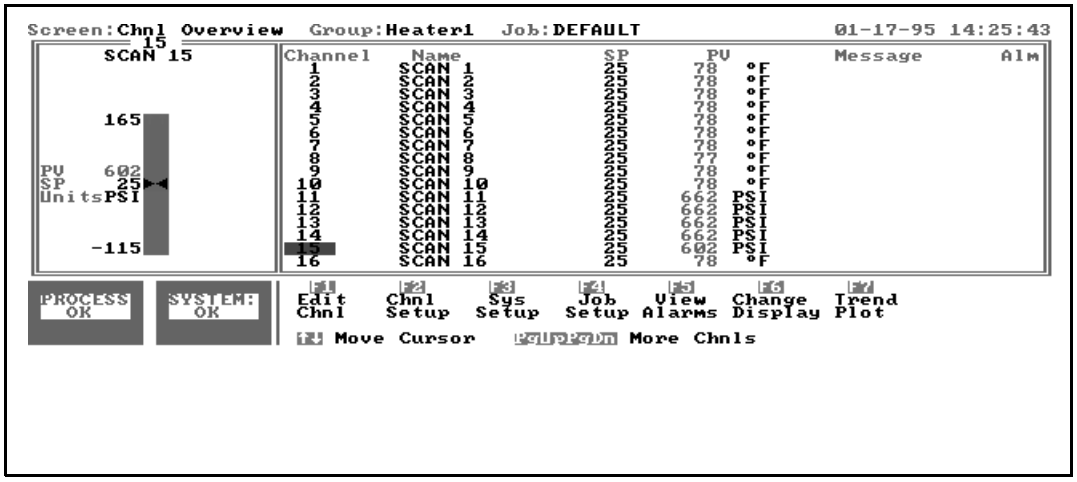
The Edit screen enables you to change the setpoint of the single channel display you have selected:

The Edit screen uses the same format as the Overview screen, only here you can move the cursor to change the values. This screen is not password protected.

The Edit screen performs the same functions as the change setpoint on the CAS front panel.

Getting Here

Press F1 from the Overview screen. You will enter an Edit screen with the same display as the screen you were in before pressing F1. The screen below is an Edit screen for the 16 channel display, and the additional 17th channel for pulse.



Function Keys

Key	Function
PgUp/PgDn	Display other channels for editing.
Tab	Reach channels of other groups.
ESC	Return to Overview screen.

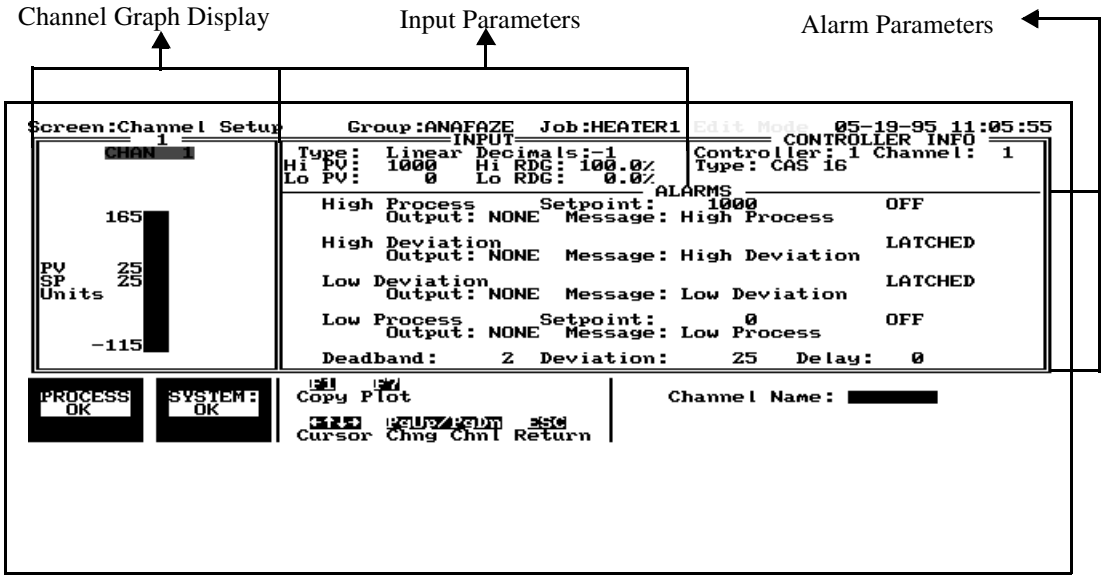
CHANNEL SETUP

From the Channel Setup screen you can select inputs, assign channel names, and set the ranges and functions of alarms for each single channel display you have selected. Use this screen to change all available channel parameters.

Watlow Anafaze recommends that you protect this screen with a password. Use the F3 System Setup screen Password window.

Getting Here

Press F2 from the Overview screen.



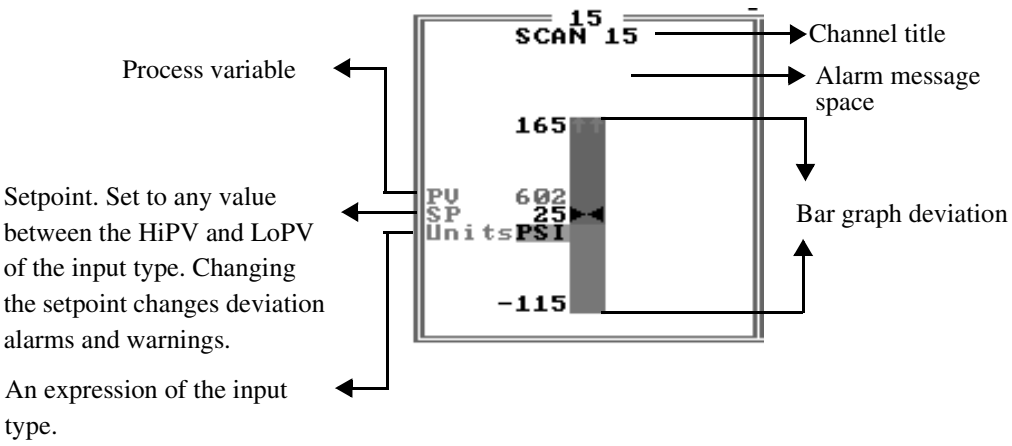
Function Keys

Key	Function
F1	Copy all channel parameters into the channel currently displayed.
F7	Display the Graphic Trend Plot of the channel. Press Esc to return to the channel Setup screen.
PgUp/ PgDn	Change the display to other channels within the group.
TAB	Change the display to other groups. Available only when there is more than one group.
ESC	Return to Overview screen.

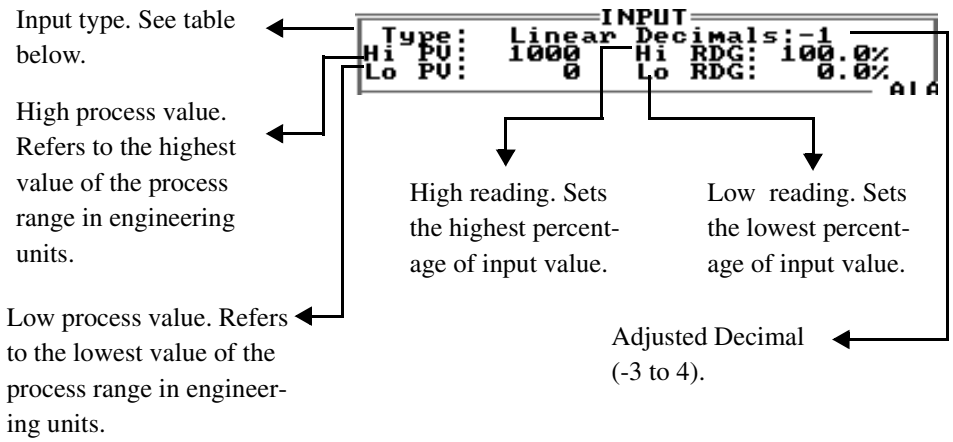
Parameters

To review all the parameters available in this screen, we have divided it into three sections (shown in previous page): Channel Graph Display, Input Data, and Alarm Output Data.

Channel Graph Display



Input Data



Field Name	Selections	Notes
Input Type *	J, K, T, S, B, R, N, PL-II	Thermocouple inputs (refer to table on following page)
	L	Linear (see description)
	X	Skip
	Pulse	(Channel 17 Only (see description)
PV Offset	-300 to 300 Default = 0	
High PV	-9999 to 30000 Default = 1000	Linear and Pulse only, Adjustable decimal
Lo PV	-9999 to 30000 Default = 0	

Field Name	Selections	Notes
Hi RDG	-99.9 to 999.9 Default = 1000	Linear and Pulse only, Adjustable decimal
Lo RDG	-99.9 to 99.9 Default = 0	

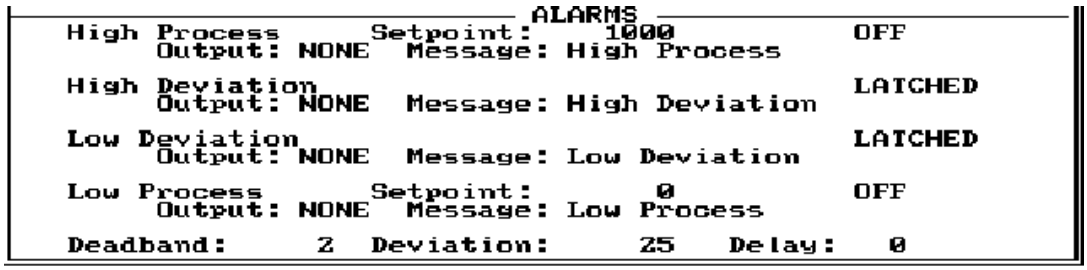
* The input types you can select depend on the type and options installed in the CAS. The input types available are displayed in the input type editing prompt. Input types available in the CAS:

- **Thermocouple**: Various types are available. The range is determined in firmware and by the Engineering Units selected.
- **Linear**: This is a linear voltage input type. it can be used with any linear output sensor that can be scaled to the linear input voltage range of the CAS.
- **Pulse**: This allows devices which generate digital pulse signals such as optical encoders to be connected to the channel.

The table below describes the input types and ranges.

Input Type	°F Range	°C Range
J	-350 to 1400	-212 to 760
K	-450 to 2500	-268 to 1371
T	-450 to 750	-268 to 399
S	0 to 3200	-18 to 1760
R	0 to 3210	-18 to 1765
N	-450 to 2370	-268 to 1299
B	150 to 3200	66 to 1760
PL-II	+50 to 2012	+10 to 1100
Skip	channel is not scanned or displayed	
Linear	See Appendix.	
Pulse	0-2KHz	

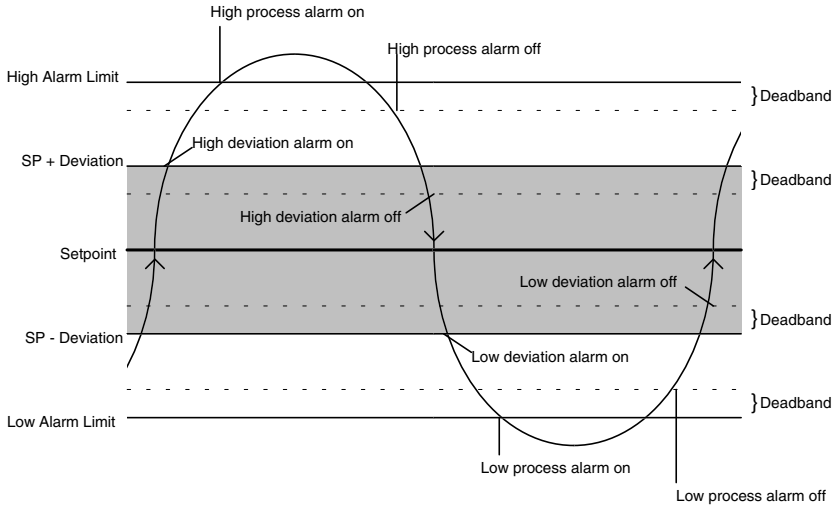
Alarm Output Data



Field Name	Selections	Notes
High Process Alarm	O = OFF (default)	No alarm
	L = Latched	If the system is in a **Non-Alarming** state, the alarm can be acknowledged by pressing the ENTER key from the alarm screen when the Process Alarm indicator is flashing. Reset the alarm by pressing F10 and entering each affected channel number individually. This can also be accomplished by pressing the ALARM RESET button on the CAS front panel.
	U = Unlatched	Digital output activates on alarm, and deactivates when channel is in a **Non-Alarming** state. Press ENTER to acknowledge the global alarm.
High Process Alarm Setpoint	-350 to 1400 default = 1000	Depends on input type selected.
High Process Alarm Output	N, 1 to 34 default = NONE	N = NONE
Low Process Alarm	O = OFF(Default) L = Latched U = Unlatched	See above descriptions.
Low Process Alarm Setpoint	-350 to 1400 default = 0	Depends on input type selected.
Low Process Alarm Output	N, 1 to 34 default = NONE	N = NONE

Field Name	Selections	Notes
High and Low Deviation Alarms	O = OFF L = Latched(Default) U = Unlatched	See above descriptions.
High and Low Deviation Alarm Outputs	N, 1 to 34 default = NONE	N = NONE
Alarm Deadband	0 to 255 default = 0	See figure below.
Alarm Deviation	0 to 255 default = 25	See figure below.
Alarm Delay	0 to 255 default = 0	See figure below.

The diagram below shows the different alarm types.



SYSTEM SETUP

The System Setup screen enables you to

1. Monitor system errors and reset these errors.
2. View the version and options of your ANASCAN.
3. Protect your screens using passwords.
4. Edit various system parameters, such as video control and alarm display screen.
5. Terminate the program.
6. Choose additional options for Start Up sequence.
7. Control data logging feature.
8. View the CAS communication status (enabled or disabled).
9. Set the polarity of the digital outputs used for alarms.

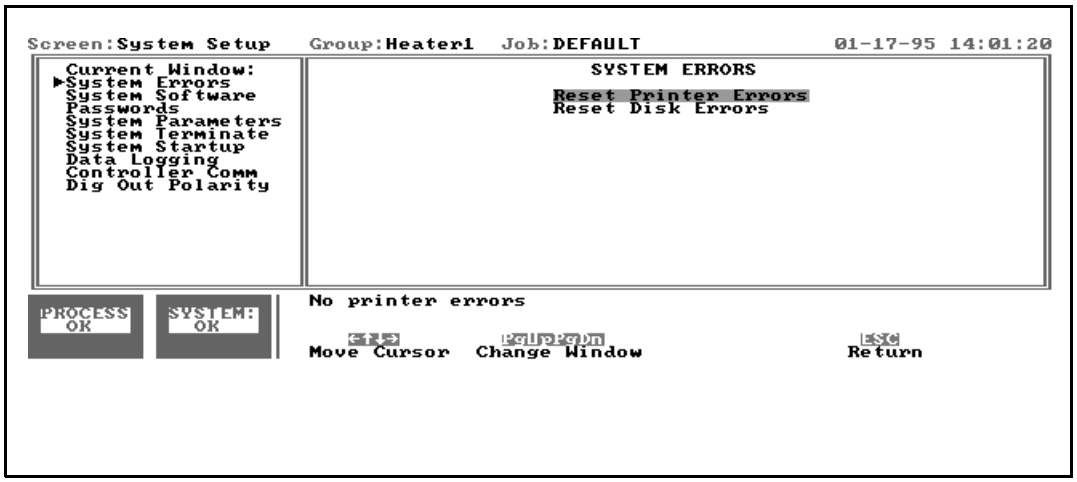
The screen is divided into two sections: the left part of the screen is a list of the available windows. An arrow is pointing to the window currently displayed. The right part of the screen displays one of the available windows. Each one contains parameters for editing or viewing. You can view only one window at a time.

Each window, except the System Errors window, can be either Locked or Unlocked. If the window is **Unlocked**, you can change the parameters. If the window is **Locked**, you can only view the parameters. You can unlock a window by entering the password.

Getting Here

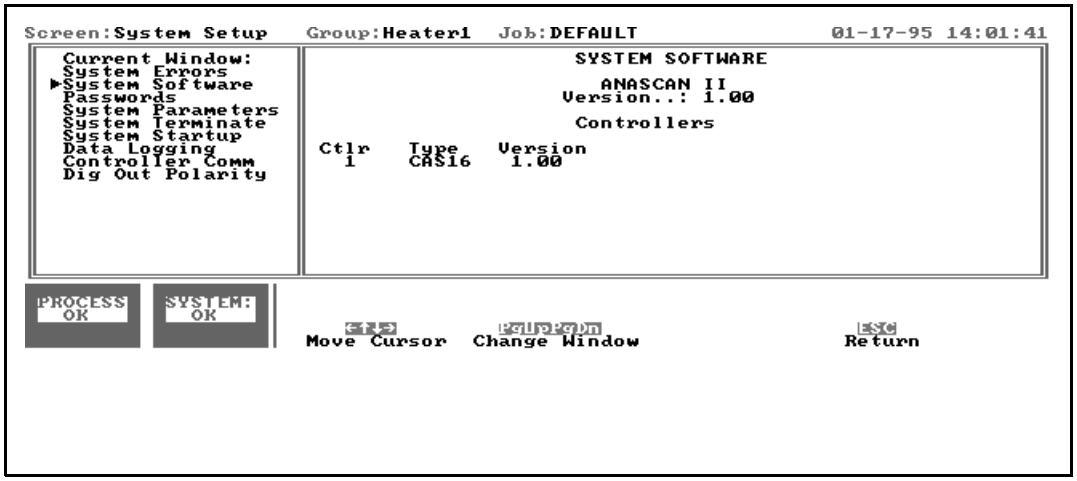
Press F3 from the Overview screen.

System Errors



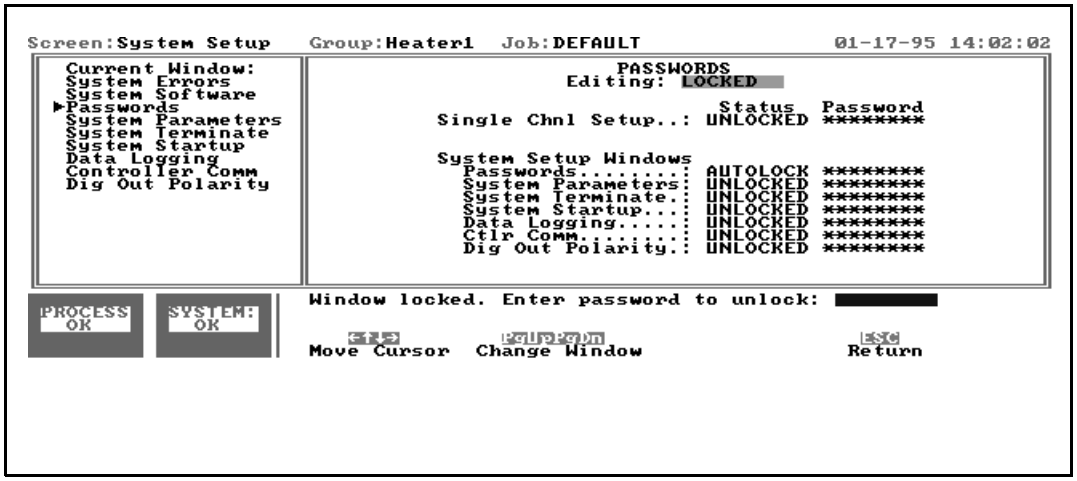
- This window describes any system errors along with the date and time it occurred. It also allows you to reset these errors.
- If a printer error message is displayed, printer data logging is suspended until you reset this error from the window. Similarly, if a disk error message is displayed, disk data logging and status logging is suspended until you reset this error. Communication errors are also displayed on this screen but you cannot reset them.
- If there is a failed communication with a CAS in the system, ANASCAN will repeatedly retry communicating with the CAS. While there is failed communication, an error message is displayed. When communication is established, the error message is erased.

System Software



- This window displays the version and options of the software in the system.
- The upper part of the window displays information about ANASCAN. The lower part displays information about the CAS.

Passwords



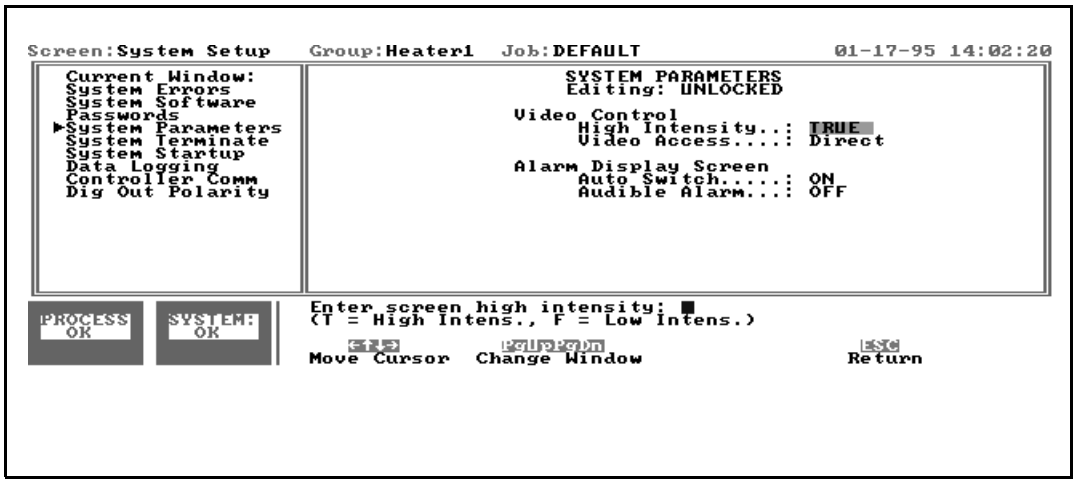
- This window allows you to edit passwords and lock the System Setup windows and some other ANASCAN screens.
- Each window or screen can be either password protected (LOCKED status) or accessible for all (UNLOCKED status).

- The passwords are all set to “PASSWORD” when ANASCAN is shipped. Change the password status and password before running a process.

NOTE

Passwords are not required for ANASCAN to function. However, we recommend that you protect critical screens.

System Parameters



This window allows you to edit various system parameters as described below.

Video control

- **High Intensity.** Set to either **True** or **False**. For most systems containing a CGA monitor or better (as Watlow Anafaze recommends), set to True. For some LCD or monochrome displays the cursor display and prompt display may not appear correctly. In this case, set to False.
- **Video Access.** Set to either **Direct** access or **BIOS** access. Direct access allows fast screen displays but produces “snow” on some CGA video systems. BIOS access prevents “snow” but is slower.

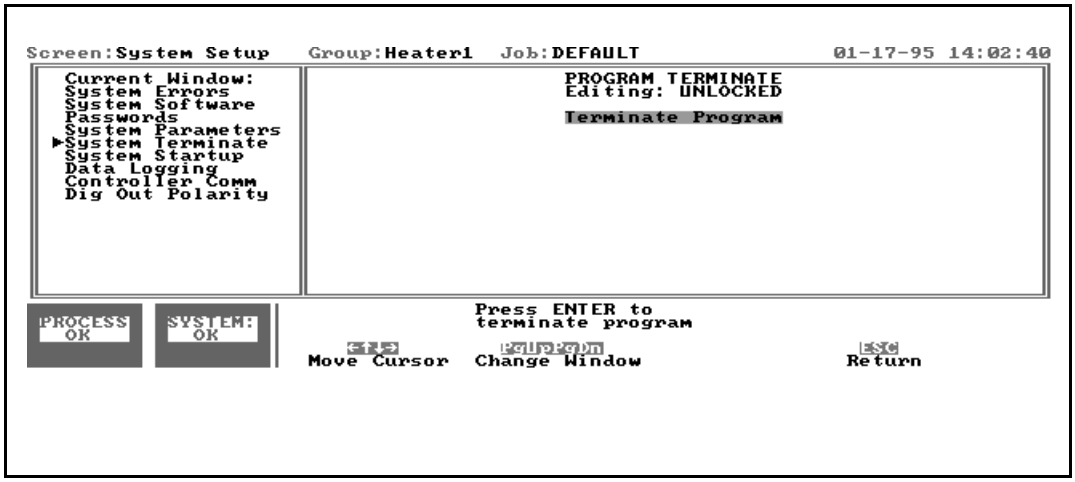
Alarm display screen

- Auto Switch. Set to On or Off. When on, the screen automatically switches to the View Alarms screen whenever a new alarm condition occurs (latched alarms and thermocouple breaks only). This calls maximum attention to an alarm, and Watlow Anafaze recommends automatic switching for normal operation. When setting up a

new process or for a short time, when the process is first started, you may set automatic switching to Off. The large alarm block will still indicate by flashing each new alarm, but the system will not automatically switch to the alarm screen.

- Audible Alarm. Set to On or OFF. When on, the computer emits an audible warning for each new alarm.

System Terminate



- This window allows you to terminate ANASCAN.
- Press **Enter** when the cursor is on the "Terminate Program" message. The program prompts as follows:

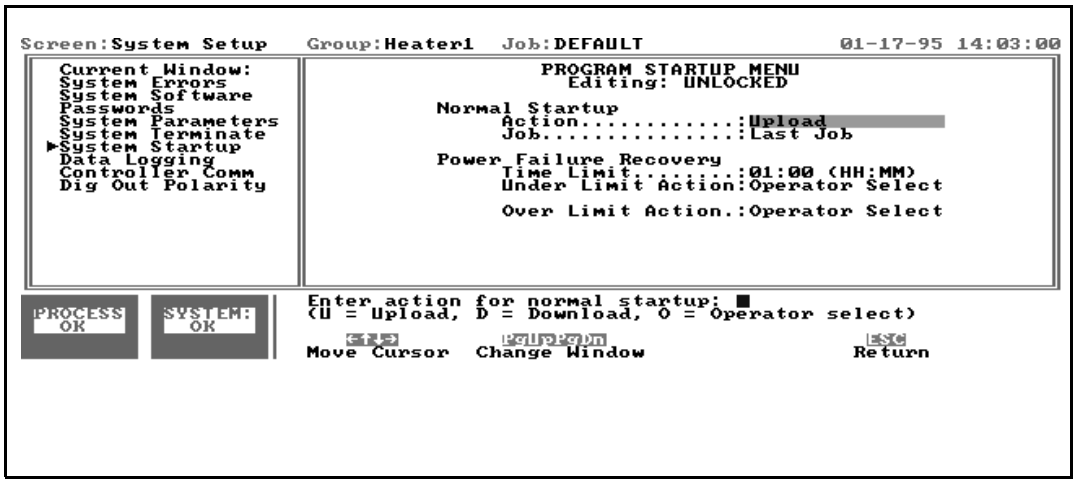
Terminate Program (Y/N)?

If you have edited the current job without saving to disk, the following message appears:

NOTE: The current job has been changed. To save changes to job file, use the Save Job function of the Job Setup screen before terminating the program.

- The program terminates and returns to the operating system.
- If you terminate the program only for a short time, to change a disk or to fix a computer problem, and safety devices are in the process, you can leave the CAS On.

System Start Up



This window allows you to set the two start up conditions:

- Normal start-up
- Power failure recovery:
  under time limit
  over time limit

For each of these conditions, you can select one of three start up actions:

1. **Operator Select.** The program displays the job directory and prompts you for the job to run.
2. **Download Profile.** The program automatically downloads the specified profile.
3. **Upload Profile.** The program automatically uploads the specified profile.

When you choose Download Profile or Upload Profile, you will be asked for a job's name. This can be either a specific job or the last job running when ANASCAN was terminated.

Normal start up action

This is the start up action when the program starts up normally.

Power failure recovery

When the program starts up following a power failure, it determines the time between the power failure and the start up. If the time is less than the power failure recovery time limit, the program takes the under limit start up action. If the time is greater than the power failure recovery time limit, the program takes the over limit start up action. The time limit is entered in hours and minutes.

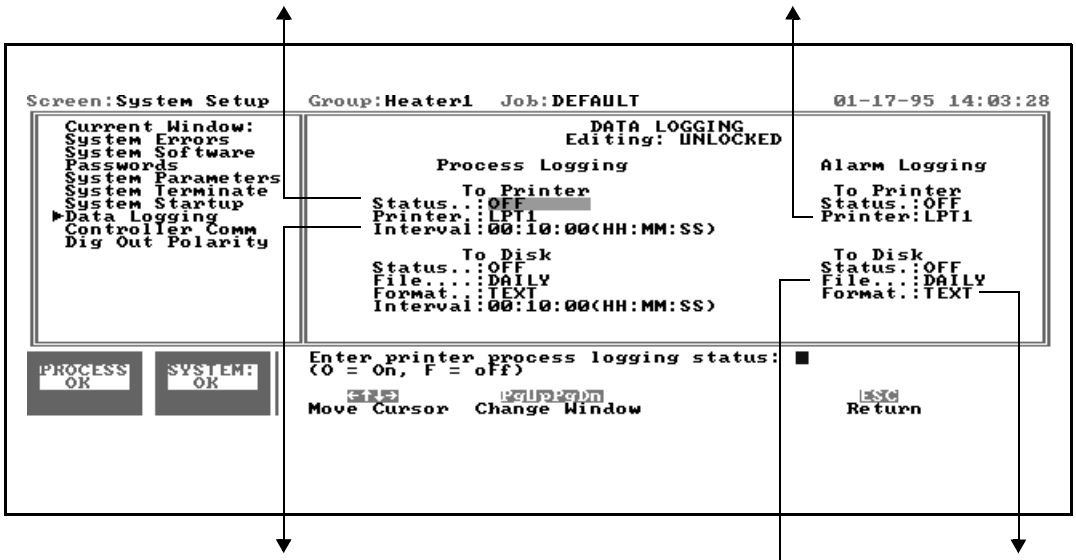
NOTE

In order for the power failure recovery sequence to operate, ANASCAN must be started automatically when the computer is powered up. This is done using an AUTOEXEC.BAT file which contains commands which the computer executes at power up. See DOS operating manual for description of AUTOEXEC.BAT files. The file should contain as its last commands:
1) a command to enter the disk directory containing ANASCAN.
2) a command to stated executing the ANASCAN program.

Data Logging

Sets the logging function On or Off.

Directs the printer data logging to one of the two printers that can be connected to the computer.



Process logging interval. Set in hours:minutes:seconds. The range for disk logging is 00:00:05 to 99:59:59, and for printer logging--00:00:15 to 99:59:59.

Disk file name for the data logging. Any DOS file name up to 8 characters. The name must not include an extension since ANASCAN adds an extension depending on the file's type.

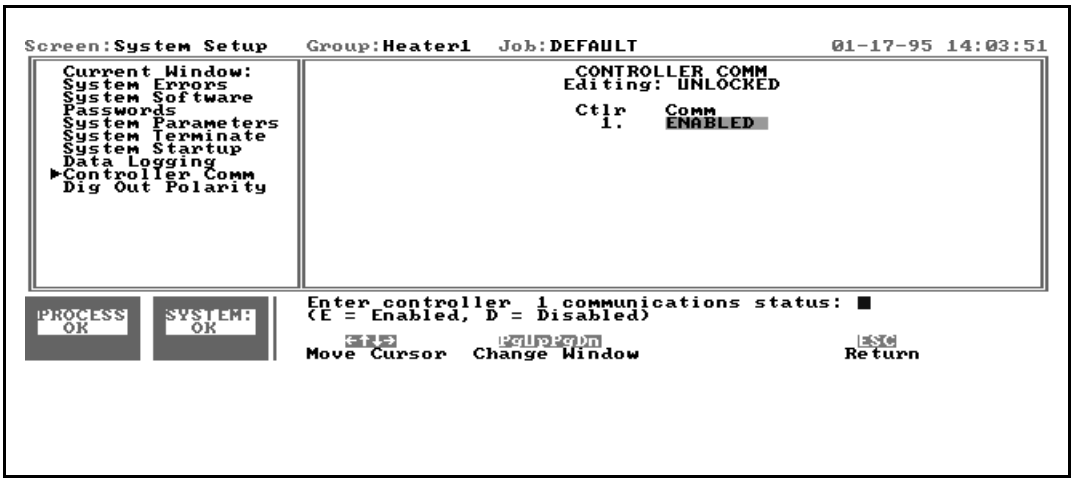
Lotus or Text. Lotus files have WK1 extension and they can be read directly in Lotus 123. Text files have TXT extension and they can be printed or read directly into a standard text editor.

- This window controls the data logging features of ANASCAN.
- Two types of logging are available:

1. Periodic process variable logging - periodically records the process variable for all the channels in the system.

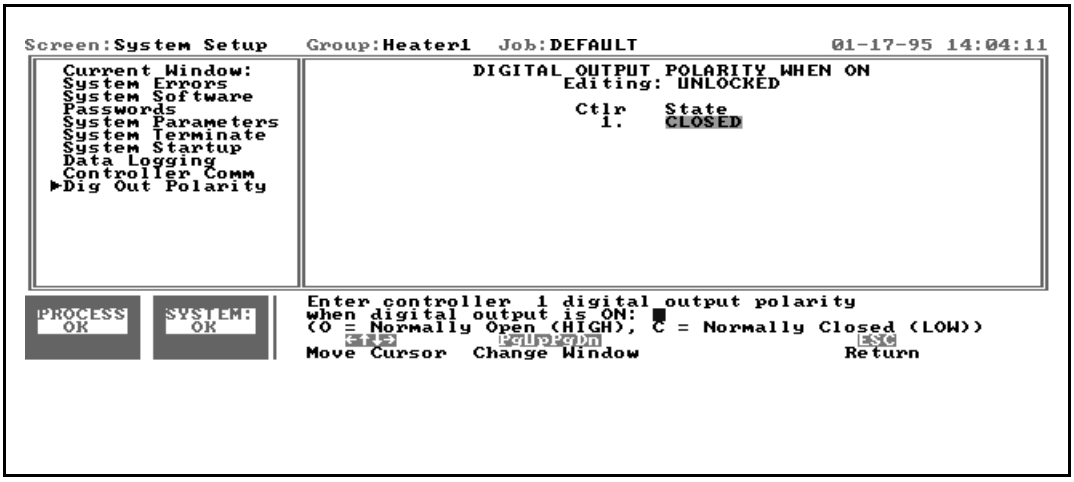
2. Alarm logging - records alarm conditions as they occur in the process. Alarms are recorded on alarm occurrence, alarm acknowledge, and alarm clearing.

Controller Comm.



- This window allows you to disable or enable the communication to a CAS.
- Disable the communication if you don't want to send changes to the CAS.
- When changing the status to Enabled, you are asked whether to download or upload parameters.

Digital Output Polarity



- This window allows you to set the polarity of the digital outputs used for alarms.
- Two options are available when digital output is On:

1. O — normally open (high)
2. C — normally closed (low)

JOB SETUP

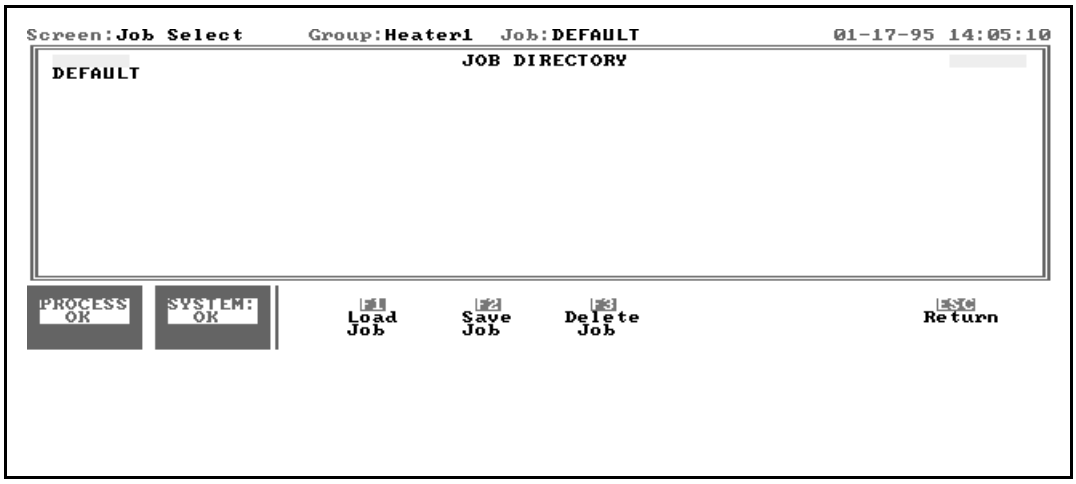
The Job Setup screen enables you to

1. Load a Job from the disk and download the parameters to the CAS.
2. Save the currently running job on the disk.
3. Delete a job from the disk.

The Job Setup screen displays a directory of up to 112 job names for each group configured in the SCANINST as a different type number.

Getting Here

Press F4 from the Overview screen.



Function Keys

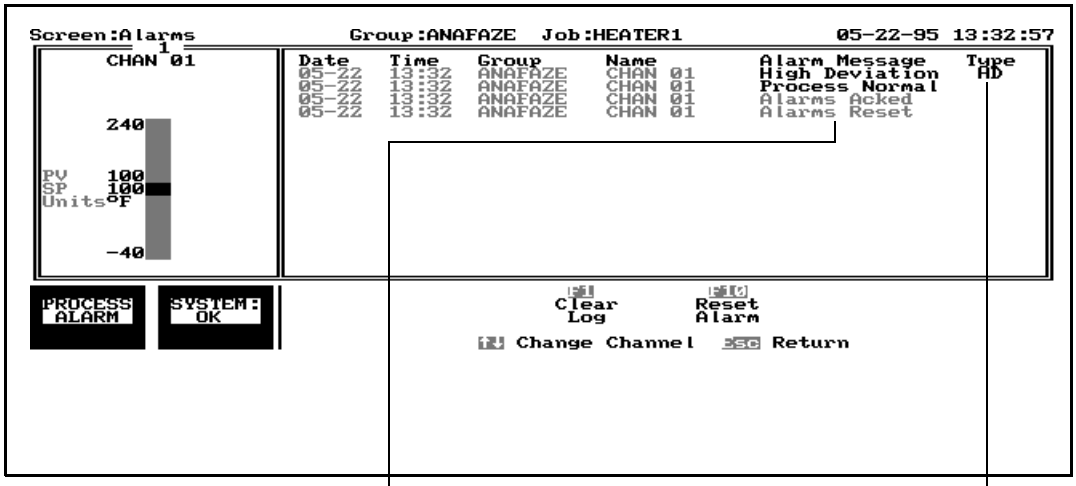
Key	Function
TAB	Change to other groups in the system.
F1	Load a job from the disk, and download parameters to the CAS.If you edited the current job after loading, you will be asked to save before loading.
F2	Save job on disk. If the job name already exists, you will be asked whether to overwrite the existing file.
F3	Delete job from disk.
ESC	Return to Overview screen.

VIEW ALARMS

The View Alarms screen offers an overview on the alarm and warning conditions by providing detailed information on when they occurred, acknowledged, or cleared. This screen also enables you to acknowledge the alarms and warnings.

Getting Here

Press F5 from the Overview screen.



Four possible messages:
"Alarm Message"--alarm has occurred. You see the message defined on the Channel Setup screen.
Alarms Acked--alarms acknowledged from ANASCAN.
Remote Acked--alarms acknowledged from the CAS.
Alarms Reset--alarms reset from ANASCAN.
Remote Reset--alarms reset from the CAS.
Process Normal--alarm was cleared.

Possible types:
HP--high process
LP--low process
HD--high deviation alarm
LD--low deviation alarm
TB--T/C Break

Function Keys

Key	Function
F1	Clear log. Press after all alarms are acknowledged.
F10	Resets Latched alarms by channel number.
ESC	Return to Overview screen.

Alarm Screen Auto Switch

If you set the Auto Switch On in the System Parameters menu, the Alarm screen appears automatically for each new latched alarm. You will be asked to acknowledge each alarm. After doing that you can press Esc to return to the last screen displayed before the alarm condition occurred.

Acknowledging the alarms from View Alarms screen also acknowledges the alarms at the controller. Acknowledging the alarms at the controllers will acknowledge the alarms on the View Alarms screen.

Audible Alarm

If you set the Audible Alarm On in the System Parameters menu, the computer emits an audible warning for each new alarm. Press Enter to silence this alarm.

TREND PLOT

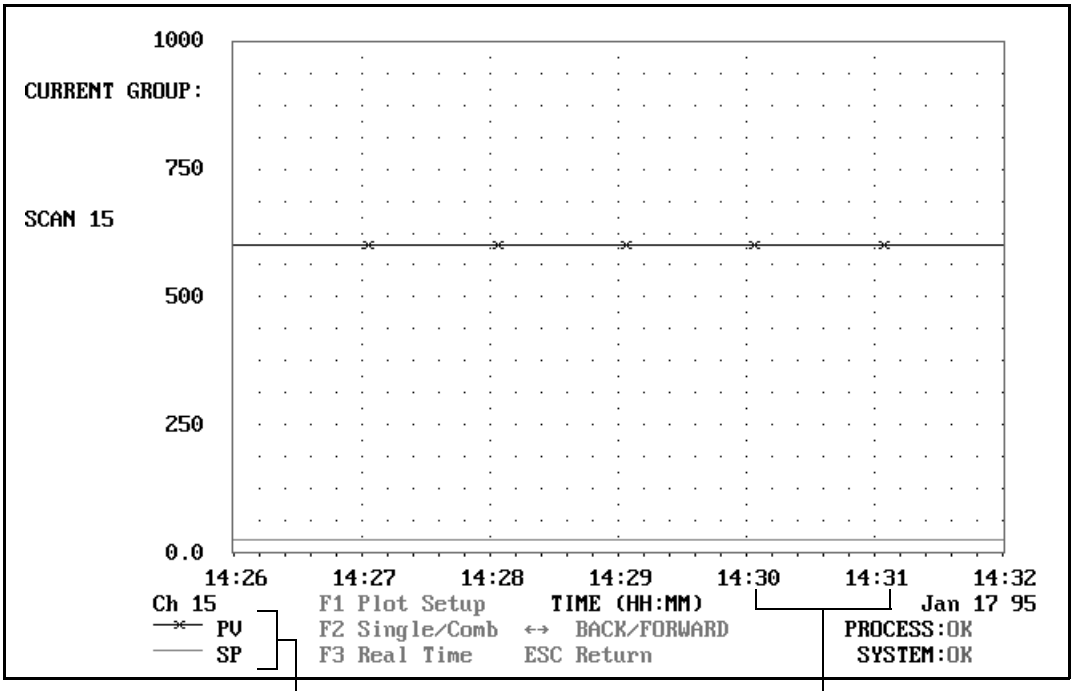
The Trend Plot screen offers graphic trending for both real time and past history of up to 48 hours. Two parameters can be plotted: process variable and setpoint. You can use any combination of these values. You can also combine channels, and plot up to three different channels at the same time.

The screen is a combination of past and real time trend plotting. The past is on the left 5/6 of the screen and the real time is on the right 1/6.

If an EGA video card is installed in the computer, the screen will be colored for easier identification. If a CGA video card is installed, the plot will be displayed in black and white only.

Getting Here

Press F7 from the Overview screen or the Channel Setup screen.



A legend for the parameters being plotted

One segment out of six in the time scale. Set in minutes or hours.

Function Keys

Key	Function
F1	Plot setup. Enter the Plot Setup screen.
F2	Single channel. Display the trend plot for the channel being edited when you entered the Trend Plot screen.
F3	Combine channels. Display the trend plot for the first group of combined channels defined on the Plot Setup screen
ESC	Return to the screen the trend plot was entered from.

Trend Plot Setup Screen

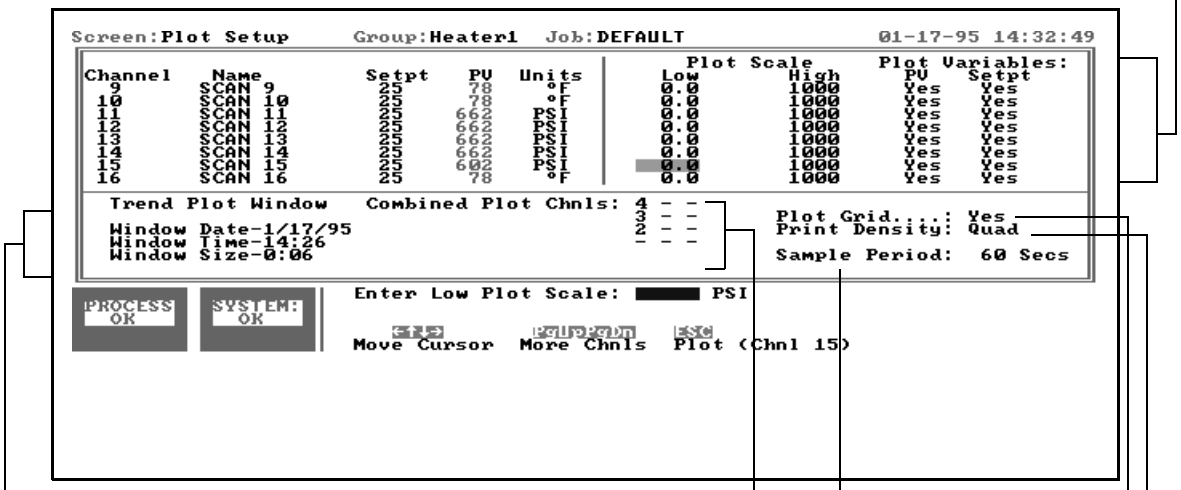
The Plot Setup screen allows editing scales and parameters and combining channels.

Getting Here

Press F1 from the Trend Plot screen. The screen is shown on the next page.

Information on 8 channels. You cannot edit this part!

Edit here the channel plot range and the two parameters of the plot. Press N if you do not wish to plot one of these parameters.



Window parameters: date, time, size.

Combine up to 3 channels in one graphic display. Type in channel numbers separated by spaces.

If you set to YES, the plot will be displayed on a fine grid for a quick referencing.

Values are recorded in periodic intervals according to this time scale. The available range is 1 to 255 seconds.

Indicates the density of the print screens. Set to single, double, or quad.

Print Trend Plot Screen

- To print the Trend Plot screen, you need an IBM graphic compatible printer.
- **Press** the Print Screen key. The program will ask for a title for the print out.
- **Type** the title and press Enter. This title will be displayed at the lower center of the screen and will be printed with the plot screen. The printing of the screen at the moment of pressing Enter will be transferred to a buffer and the screen will be printed as a background task. The Trend Plot screen will be updating and other screens may be accessed.
- **Be sure** your printer is powered and On Line; otherwise, a printer error will appear on the Systems Error window.

APPENDIX: Input Scaling

All inputs use the automatic scaling function of the Mx+B calculation. The end points of that calculation are set by HiPV, LoPV, HiRDG, and LoRDG. The default values are set by the input Type selection. Do not adjust these values until you completely understand what those adjustments will do.

The T/C ranges are set in the firmware, and you don't need to adjust those ranges for a proper operating hardware or software. The default values provide correct operating parameters as to stated accuracy and Alarm settings.

For Linear inputs the scaling of the input is required to obtain correct engineering units of the input. This must be done before setting SP and Alarm settings.

Linear Input Scaling

A linear input of 60 mv or less is scaled according to the engineering unit and mv range of the input signal. The CAS has a -10 to 60 mvdc analog input range. All linear inputs must be scaled to that range by scaling resistors on the input.

The HiPV and LoPV is the range of the engineering unit, while the HiRDG is the % of the Hi end signal level mv with reference to 60 mv and the LoRDG is the % of the Lo end signal level with reference to 60 mv.

Example 1

Situation

A pressure sensor that generates a 4-20 milliamp signal is connected to the CAS. The specifications of the sensor state that it generates 4 milliamps at 0.0 PSI and 20 mA at 50.0 PSI.

Setup

The sensor is connected to a channel input set up with a resistor scaling network to produce 60 millivolts at 20 mA. (See the Inputs section of the Installation section of this manual for more information on scaling networks.)

The sensor measures PSI in tenths, so the appropriate display format is -999.9 to +3000.0.

This table shows the input readings.

PV Displayed	Sensor Input	Reading (%FS)
50.0 psi	20	100%
0.0	4	100% x (4ma/20ma) = 20%

The scaling values are therefore:

Parameter	Low Value	High Value
Process Value (PV)	0.0 psi	50.0 psi
Input Reading (RDG)	20.0	100.0

Example 2

Situation

A flow sensor connected to the CAS measures the flow in a pipe. The sensor generates a 0-5V signal. The sensor's output depends on its installation. Independent calibration measurements of the flow in the pipe indicate that the sensor generates 0.5 volts at three gallons per minute (GPM) and 4.75 volts at 65 GPM. The calibration instruments are precise to ±1 gallon per minute.

Setup

The sensor is connected to a channel input set up with a resistor voltage divider network to produce 60 millivolts at 5 volts. (See the Inputs section of the Installation chapter for information on scaling networks.)

The calibrating instrument is precise to ±1 gallon per minute, so the appropriate display format is -999 to +3000.

This table shows the input readings.

PV Displayed	Sensor Input	Reading (%FS)
65 GPM	4.75	(4.75 V/ 5.00 V) x 100% = 95%
3 GPM	0.5	(0.5 V/ 5.00 V) x 100% = 10%

The scaling values are therefore:

Parameter	Low Value	High Value
Process Value (PV)	3 GPM	65 GPM
Input Reading	10.0	95.0

Example 3

Situation

A pulse encoder which measures the movement of a conveyor is connected to the CAS. The encoder generates 900 pulses for every inch the conveyor moves. You want to measure conveyor speed in feet per minute (f/m).

Setup

The encoder input is connected to the CAS pulse input. An one second sample time gives adequate resolution of the conveyor's speed.

The resolution is:

$$\frac{1\ pulse}{1\,\mathrm{sec}ond} \times \frac{60\ \mathrm{sec}onds}{1 minute} \times \frac{1\ inch}{900 pulses} \times \frac{1\ foot}{12 inches} = 0.006\ f/m$$

so a display format of -99.99 to +300.00 is appropriate.

The input readings are as follows.

At the maximum pulse rate of the CAS (2000 Hz):

$$\frac{200 pulses}{1\,\mathrm{sec}ond} \times \frac{60\ \mathrm{sec}onds}{1 minute} \times \frac{1\ inch}{900 pulses} \times \frac{1\ foot}{12 inches} = 11.11 f/m$$

At zero hertz, the input reading will be 0.00 f/m.
Therefore, the scaling values are:

Parameter	Low Value	High Value
Process Value (PV)	0 f/m	1.11 f/m
Input Reading (RDG)	0 Hz	2000 Hz