ARGUS

SM04
System Control Panel

018-543-B2

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Power

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SM04
System Control Panel

018-543-B2

The following documents and drawings are included in this manual to provide the necessary information required for installation, operation and fault diagnosis of the unit:

- **Specifications, SM04:** 018-543-B1 Rev B
- **Warranty Policy:** 048-507-10
- **Program Licence Agreement:** 048-556-10
- **Important Safety Instructions**
- **Installation and Operation Instructions:** 018-543-C0 Rev B
- **Outline Drawing:** 018-543-06
- **Customer Connections:** 018-543-08
- **Factory Service Information:** 048-527-10

Additional manual/documents to be included with this product:

- **Setup Guide, SM04:** 954-397-10

Argus Technologies Ltd. **018-543-B2 Rev C WC**

SPECIFICATIONS FOR ARGUS TECHNOLOGIES' SYSTEM CONTROL PANEL SM04

Basic Unit

Input Voltage:	20 to 60VDC
Dimensions:	44mm H x 432mm W x 203mm D (1.75" H x 17" W x 8" D)
Mounting:	19" and 23" relay rack, flush mount (1.75" spacing) (an integrated panel mounting option is also available)
Weight:	1.2 kg (2.6 lb.)
EMI:	The unit is designed to meet requirements of: ICES-003 Class B EN55022 Class B (CISPR 22) FCC Part 15, Subpart B, Class B
Input Fuse Rating:	1 Amp, 125VDC maximum Littlefuse: R251001

In Accordance with FCC requirements, we provide the following statement as specified in the FCC guidelines for conformance to Part 15, Class B:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- **Reorient or relocate the receiving antenna**
- **Increase the separation between the equipment and receiver**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected**
- **Consult the dealer or an experienced radio/TV technician for help.**

Any changes or modifications to this equipment not expressly described in this manual could void the FCC compliance.

SPECIFICATIONS FOR ARGUS TECHNOLOGIES' SYSTEM CONTROL PANEL SM04

Environmental

Operating Temperature:	0 to 65°C standard (32 to 149°F) -40 to 65°C optional (-40 to 149°F)
Humidity:	0 to 95% (non-condensing)

Hardware Specifications

CPU:	H8S/2148
Display:	2 x 16-character LCD
Front Panel Keypad:	6 membrane touch-keys including: ALCO key (silence audible alarms) 2 arrow keys (adjustment/scroll) Enter/Select key (edit/save) ESC key (cancel) F1 key (future use)
Control:	LVD override switch, mounted on: faceplate – rack mount version front door – panel mount version
LED Indicators:	System OK (Green) Power System Minor Alarm (Yellow) Power System Major Alarm / SM04 Fail (Red)
Internal Battery:	3V Lithium CR2477N
Input Channels:	6 analog inputs, including: Voltage 1 and 2 Current 1 and 2 Temperature 1 and 2 3 virtual analog inputs, including: Battery charge current Total rectifier output current Total system load 6 digital inputs, including: 4 user assigned 2 dedicated to LVD override control
Output Channels:	8 programmable Form C relays (controls and/or alarms)
Communication Ports:	RS-232 (null modem required), 2x RS-485 (RJ), Telco port
Internal Modem (option):	33600 baud

Recommended Connection Wire Sizes (as per UL/CSA)

Temperature Range	Minimum Wire Size
0 to 50°C	2.5 to 0.34 mm^2 (#14 to #22 AWG)

Part Numbers and List Options

This product is available with the following part numbers and list options:

Description	Part Number/List Option
SM04	018-543-20
Basic unit	*List 0
24V system software configuration	List 1
48V system software configuration	List 2
Standard temperature, 0 to 65°C (32 to 149°F)	List 40
Extended temperature, -40 to 65°C (-40 to 149°F)	List 42
Gray finish	*List 55
Temp sensor assembly, 1/4" lug, 6' cable	List 71
Temp sensor assembly, 1/4" lug, 12' cable	List 72
Temp sensor assembly, 1/4" lug, 24' cable	List 73
Temp sensor assembly, 3/8" lug, 6' cable	List 74
Temp sensor assembly, 3/8" lug, 12' cable	List 75
Temp sensor assembly, 3/8" lug, 24' cable	List 76
Temp sensor assembly, 3/8" lug, 50' cable	List 77
Temp sensor assembly, 1/4" lug, 50' cable	List 78
Screw terminal blocks	*List 82
Plug-in connectors (instead of List 82)	List 83
Plug-in insulation displacement connectors (instead of List 82)	List 84
Baffle mount, dual LVD switches	List 92
Internal modem billing tone filter, 16kHz (requires List 103 or 104)	List 100
Internal modem, standard temperature, Canada, US, Japan (requires List 40)	List 101
Internal modem, extended temperature, Canada, US, Japan (requires List 42)	List 102
Internal modem, standard temperature, world wide (requires List 40)	List 103
Internal modem, extended temperature, world wide (requires List 42)	List 104

*** Default options, e.g. brackets are set to 19" flush mounting**

The above information is valid at the time of publication. Consult factory for up-to-date ordering information.
Specifications are subject to change without notice.

MANUAL ADDENDUM

Unit Description: SM04 SYSTEM CONTROL PANEL
Manual P/N: 018-543-B2 Applies to Manual Revision: B

#	Date	Page#	Line#	Correction to be implemented
1	03-01-28	3 of 3 018-543-B1	30	Insert text: **Compliance (modem options):** **For List 101 or 102,** **Complies with Part 68, FCC rules;** **Modem: Xecom XE3314L; Reg. No.: DWEUSA-25983-M5-E** **REN: 1.0B Jack: RJ11** **For List 103 or 104,** **Complies with Part 68, FCC rules;** **Modem: Xecom XE3314C; Reg. No.: DWEUSA-35610-M5-E** **REN: 1.0B Jack: RJ11**

MANUAL ADDENDUM

Unit Description: SM04 SYSTEM CONTROL PANEL
Manual P/N: 018-543-B2 Applies to Manual Revision: B

#	Date	Page#	Line#	Correction to be implemented
1	03-04-23	5	19	Revise text (Section 2.2.2): Factory software updates are possible through **the RS-232 serial port and through the modem**.
2		11	21	Revise text (Section 2.3.8.7): **The function RESET SETTINGS will force a reboot and will** reset the SM04 to factory default settings based on the voltage detected at V1.
3		11	24	Revise text (Section 2.3.9): This menu category consists of rectifier **and power systems** communications controls. Operators can set/access rectifier baud rates, **local terminal baud rates (RS-232), modem dial-back numbers,** etc.
4		11	29	Insert Section 2.3.9.2, see below:

2.3.9.2 Modem & Terminal
[Subsection of Menu Descriptions/Communications]

This menu function allows programming of the following modem and terminal communications settings:

Port Setting – assignment of the connected device; i.e., internal modem, external modem or terminal.
Baud Rate – setting of modem/terminal communications speed.
External Initialize (EXT INIT) String – programming of initialize string for external modem.
Internal Initialize (INT INIT) String – programming of initialize string for internal modem.
Dial In Access – assignment of the mode of access to LOCKOUT, DIAL BACK, or PASSWORD.
Dial Back Number (Number 1-3) – programming of three dial back phone numbers. The numbers are used by the SM04 to dial (call) back after being initially contacted by a remote operator through a modem connection.

#	Date	Page#	Line#	Correction to be implemented
5		17	31	Insert Section 5.7, see below:

5.7 Modem & Terminal Connections
5.7.1 Telco

For SM04's with the optional internal modem, connect to the RJ-11 jack (P10 on the motherboard, see sheet 2 of drawing 018-543-08). *Argus Technologies recommends a POTS ("plain old telephone service") connection for data transmission. See External Communications section.*

5.7.2 RS-232

For communications with a local terminal, connect to the RS-232 DB-9 serial port as provided on the front panel of the SM04 (see drawing 018-543-06).

#	Date	Page#	Line#	Correction to be implemented
6		23	16	Replace Table H–Communications Menu Defaults, see below:

Submenu Item	Programmable Range	Default Setting (24VDC)	Default Setting (48VDC)
RECTIFIER/ BAUD RATE	19k2, 9600	9600 baud	9600 baud
PORT	Auto Select, External, Internal	AUTO SEL	AUTO SEL
BAUD RATE (modem or terminal)	38k4, 19k2, 9600	38400	38400
EXT INIT STRING	32 characters maximum	ATL0S0=1V1&D0	ATL0S0=1V1&D0
INT INIT STRING	32 characters maximum	ATL0S0=1V1&D0	ATL0S0=1V1&D0
DIAL IN (access)	Lockout, Dialback, Password	PASSWORD	PASSWORD
DIAL BACK (1-3)	0-9 (up to 31 char)/Enable/Disable	DIS	DIS

#	Correction to be implemented
7	Insert External Communications section, see below:

10 EXTERNAL COMMUNICATIONS

The SM04 can be set up, monitored and tested via an ASCII display terminal with a RS-232 serial data connection, or over a phone line using a modem. *Argus Technologies recommends a POTS ("plain old telephone service") connection for data transmission; features such as Call Display/Waiting or Voice Mail may cause unpredictable results.*

Note: If the line is interrupted during a remote access, the modem will hang up, as it no longer detects the carrier signal. The connection will need to be re-established by the operator. If interruption occurs during a file upload, then the connection has to be re-established and the upload procedure repeated from the start.

10.1 Local Control/Monitoring via the RS-232 Port

Local control and monitoring can be accomplished by connecting the SM04's front panel RS-232 to the PC or video terminal's RS-232 port.

The PC's male connector (typically a DB-25) should be configured as DTE (Data Terminal Equipment) and conform to the EIA RS-232 standard. The PC or video terminal should run in full duplex mode and support 9600, 19200, or 38400 baud. A PC running an ANSI or VT100/102 terminal emulation program is adequate. Flow control hardware and software must be turned off.

A NULL MODEM serial cable, configured for DTE operation, must be used to connect the SM04 and PC/video terminal. This cable must be purchased separately as it is not included with the SM04 (see drawing 018-543-08 for pinout descriptions).

10.1.1 PC/Terminal Setup

Before connecting the host equipment, ensure the communications access parameters, including default baud rate of your PC or terminal, is set to match the table below:

Parameter	Default	Options
Baud Rate	38400	9600, 19200, 38400
Data Bits	8	N/A
Stop Bit	1	N/A
Parity Type	None	N/A

Table–RS-232 Port Characteristics

10.2 Remote Control/Monitoring via the Modem/Port Setup

The recommended setting is AUTO SEL. This will allow a connection to be made on the internal or external port but not both.

WARNING

It is important not to change the PORT setting (in the COMMUNICATION/MODEM&TERMINAL/PORT submenu) during a remote communications session. This causes the line to disconnect.

1. If the connection is made via internal modem, the PORT setting should not be changed to External.
2. If the connection is made via external modem, the PORT setting should not be changed to Internal.

If one of the two above actions is performed, the result will be an immediate loss of connection and it will not be possible to restore the connection unless the setting is changed at the front panel or another connection is made with the other port.

10.2.1 Modem Description

The SM04 software supports Xecom XE3314X and compatible internal modems. See Table H for factory defaults (baud rate and initialize string). *Note: Modem port baud rate is initialized to the value stored in the settings file on start up.*

10.2.2 Configuring Modem Software

Connecting via modem is identical to a local RS-232 connection once a link is established. For security reasons, the SM04 only allows full remote access by means of a dial-back system or password entry. When the connection is established, user interface and access privileges are the same as the local ANSI terminal connection.

10.2.2.1 Dial Back (1-3)

The Dial Back method requires the user to program three dial-back numbers at the DIAL BACK (1-3) prompt(s) in the SM04's Communications/Modem&Terminal submenu. Up to 31 characters may be entered at the Dial Back prompts. When the user first dials the SM04, the Dial Back menu is shown (containing three numbers). The user must choose one of the numbers and then terminate the connection. The SM04 will then attempt to dial back the selected number and attempt to establish a connection twice. At this point, if connection is not established, the operation will be aborted.

10.2.2.2 Password

When the user first dials the SM04, a password must be entered to establish connection. This password is the same as the supervisor password.

10.3 Communicating with the SM04

The SM04 is designed to communicate directly with an ANSI terminal to eliminate the need for additional software. Communication with a PC is also possible with a terminal emulation program such as PROCOMM or TELIX. Display information and setup parameters are virtually identical to that available from the built-in front panel keyboard and LCD.

The Up arrow, Down arrow, Enter and ESC keys can be used to navigate menus and access settings.

Special SM04 function keys not found on ANSI terminal keyboards will be mapped to control characters as follows:

CTRL-A Activate ALCO (alarm cutoff).
CTRL-E Activate SYSTEM FLOAT/EQUALIZE functions (during normal mode of operation only).
CTRL-BOOT Reboot the SM04 and produce upload menu.

10.3.1 Software Installation Procedure

In addition to the normal functions described above, the SM04 offers extended functions such as executable software upgrades.

To upload a new version of the SM04.BIN file, follow these steps:

1. Once a connection is established to the SM04 (with a local terminal or modem), start TELIX or a similar communication program such as terminal for Windows, HYPERTERMINAL, LYNC, or PROCOM. Computer must first be configured to communicate correctly with the SM04 – see Modem & Terminal Connections section for details.

2. Once the SM04 screen appears on the monitor, press and hold the control key and type BOOT (not case-sensitive).

3. After the program goes through the startup RAM test, the Password prompt will appear. Enter the Supervisor Access Code (security code given to you by your Argus Technologies customer service representative) and press the Enter key. If the code is not entered within 10 seconds, the original application will load. *Note: A six-character alphanumeric password is required; use spaces to fill blanks as required.*

4. Select "#1" from the loader menu list; this is the upload SM04.bin function.

Note: Steps 5 and 6 that follow may vary depending on which communication program you are using. Argus Technologies has used TELIX as the standard for uploading files. The upload procedure must be done using 1k-Xmodem protocol.

5. Press ALT-PageUp to send files from TELIX.

6. Select 1k-Xmodem protocol (faster download). Type in "a:\dir\sm04.bin", where "dir" is the directory where the sm04.bin file is located, and press the Enter key.

7. Once the upload is completed (approximately 1 minute) the screen should show a message that the RAM image is flashing to memory (another minute) and the loader menu should again reappear. Select "#0" from the list or let the menu timeout and the updated application should begin to run.

10.3.2 Special Functions Menu

Entering the loader menu (after a reboot) can access the Special Functions menu. The following display will appear:

Make your selection:	
0:	Exit this menu and start Application
1:	1k-Xmodem receive new application
2:	Examine/Modify Internal Modem Init String
3:	Examine/Modify External Modem Init String
4:	Examine/Modify Password

Press correct key now (no entry will timeout to selection "0").

WARRANTY AND REPAIR INFORMATION

Warranty Policy

Argus Technologies Ltd. warrants all equipment manufactured by it to be free from defects in parts and labor, excluding third party OEM materials (example: air conditioners, batteries), for a period of two years from the date of shipment from the factory. For third party products the OEM's warranty shall apply. The liability of Argus applies solely to repairing, replacing or issuing credit (at Argus' sole discretion) for any equipment manufactured by it and returned by the customer during the warranty period. The terms of the warranty are Ex Works (EXW) from Argus' factory service location.

Argus reserves the right to void the warranty if:

(1) identification marks or serial numbers are removed or altered in any way,
(2) invoice is unpaid, or
(3) defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.

Argus shall not be liable to the customer or other parties for any loss of profits, loss of use, costs for removal or installation of defective equipment, damages or consequential damages based upon equipment failure during or after the warranty period. There shall be no other obligations either expressed or implied. Argus will not honor warranties for batteries and other third party products without prior written Argus authorization.

Freight Policy

Customer is responsible for all shipping and handling charges (COD and freight collect will not be accepted without prior approval from Argus Technologies).

Terms of Payment (North America)

Payment terms are net 30 days subject to prior credit approval. All other orders require payment before shipping.

Terms of Payment (International)

Payment terms are subject to prior approval and are typically through Tele-Transfer.

Return Material Policy

Our RMA policy is designed to ensure prompt, efficient and high quality factory service. A Return Material Authorization (RMA) number must be obtained before products can be accepted for servicing by the Argus factory. For returns to an authorized service center (refer to "Authorized Service Centers" for locations), please consult the individual service center for specific return policies and instructions.

To obtain a RMA number for a factory return, customers must call the appropriate location with the product serial and model number, as well as a brief description of the problem, shipment instructions and billing details.

The original packing container should be used whenever possible. Both the shipping documents and the outside of the box must have the RMA # clearly marked and the product shipped prepaid to the Argus factory service center. Argus will endeavor to repair products within five working days of receipt. Repairs to the returned product are warranted for a period of six months. A service charge may be applied if no fault is found in the returned product. Argus will not accept products without an RMA number.

Business Hours

Argus North American office hours are 7:30 am to 5:00 pm (Pacific Standard Time) Monday to Friday.

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important safety and installation instructions for the Argus SM04 System Control Panel.

1. Before using the SM04, read all instructions and cautionary markings on the SM04 and any product using the SM04.

2. This manual provides warnings and special notes for the user:

    a. Points that are vital to the proper operation or safety of the operator are indicated by the heading: **WARNING**.

    b. A notation that is in ***Italic*** typeface covers points that are important to the performance or ease of use of the equipment.

3. Do not expose the SM04 to rain or snow.

4. **CAUTION** – Unless otherwise noted, use of an attachment not recommended or sold by the SM04 manufacturer may result in a risk of fire, electric shock, or injury to persons.

5. **CAUTION** – Do not operate the SM04 if it has received a sharp blow, been dropped, or otherwise damaged in any way – return it to a qualified service center for repair.

6. **CAUTION** – Do not disassemble the SM04 – call our qualified service centers for servicing. Incorrect reassembling may result in a risk of electrical shock or fire.

TABLE OF CONTENTS

FIGURES

TABLES

1 INTRODUCTION

To aid the user with installation, frequent reference is made to foldout drawings located at the rear of the manual.

1.1 Scope of the Manual

This instruction manual explains the installation, interconnection and operation of the SM04 System Control Panel from Argus Technologies. The topics covered include: product specifications, features, installation and configuration, operation and maintenance.

1.2 Product Overview

The SM04 is part of the next generation of advanced system control panels; developed primarily to optimize the features of Argus Technologies' Pathfinder rectifier series and designed for operation with ±24 or 48VDC communications power systems.

The SM04 has eight programmable Form "C" output relays and provides six digital, six analog inputs, and three virtual analog inputs enabling it to monitor a wide range of power system components. The stand-alone module design, at only 203mm (8") deep and 44mm (1.75") high, is ultra compact; taking up a minimum of space in a standard 19" or 23" relay rack.

The SM04 allows the user to configure, monitor and control the entire DC power system, including rectifiers, from its central panel and LCD (see Figure 1). Conveniently mounted to the front panel is a pair of Low Voltage Disconnect (LVD) override switches for manual control in emergency situations or for maintenance. An RS-232 serial communications port, also located on the front panel, provides local terminal access. Remote access is possible through an optional built-in modem, which features auto dial-out on alarm to an alphanumeric pager.

Other features of the unit include: autoequalize and temperature compensation of the system battery voltage.

The SM04 offers many more advanced features with add-on "list options." The customer should include these list options at the time of ordering.

Figure 1–Front view of SM04 stand-alone module

1.3 Part Numbers and List Options

Refer to the specification section at the front of this manual for part numbers and ordering options.

2 FEATURES, ALARMS AND CONTROLS

The SM04 provides centralized setup, control and monitoring of your communications power system.

2.1 Hardware Features

Behind the SM04's front panel lies the main controller motherboard, fuses, as well as numerous other components. On the edge of the motherboard is a series of input and output terminal connections.

2.1.1 Operator Interface

The user interfaces with the panel through the front panel LEDs, LCD and keypad.

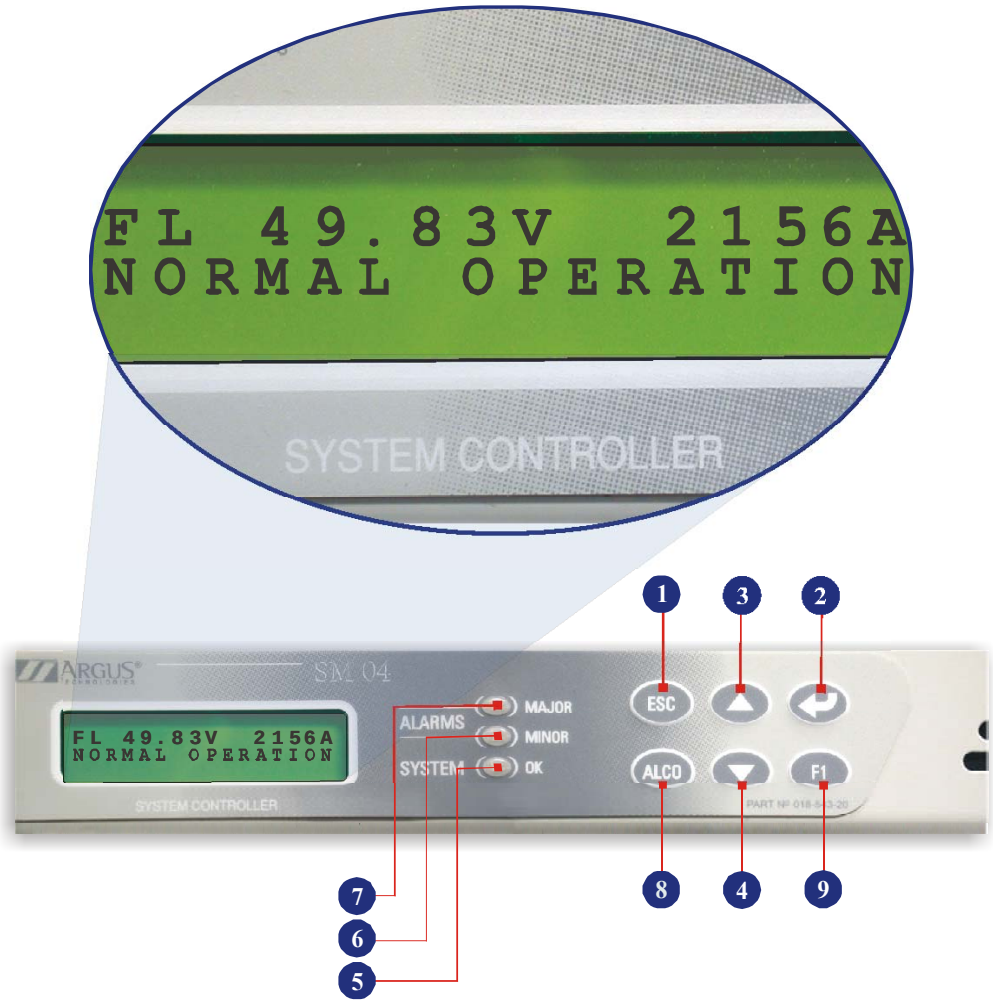


Figure 2–Front panel descriptions

2.1.1.1 Front panel descriptions

The front panel (see Figure 2) contains an LCD, six touch-pad keys, LEDs, and two Low Voltage Disconnect (LVD) override switches (not shown). A brief description of each is provided below:

1 **ESC key (special function, e.g. escape or shift)**
Returns to previous window or aborts current operation.

2 **Enter/Select key**
Enters the currently displayed item or parameter. Also used to manually toggle the operating mode from Float to Equalize and back again.

3 **Scroll up key**
Used to move the cursor through menus, increase numeric values, scroll through alphabetic characters and adjust contrast/viewing angle.

4 **Scroll down key**
Used to move the cursor through menus, decrease numeric values, scroll through alphabetic characters and adjust contrast/viewing angle.

5 **Green LED (System OK)**
Indicates that the power system is running normally.

6 **Yellow LED (System Minor Alarm)**
Indicates that a power system minor alarm condition has been detected. This LED will be activated when any alarm condition, programmed to relay K4, occurs.

7 **Red LED (System Major Alarm)**
Indicates that a power system major alarm condition has been detected or the SM04 microprocessor has failed. This LED will be activated when any alarm condition, programmed to relay K5, occurs.

8 **ALCO key**
Alarm Cut-off key is used to silence audible alarms.

9 **F1 key**
Function key for future development of commands and shortcuts.

2.1.1.2 LCD Screen

Located on the front panel is a 2 x 16-character liquid crystal display (LCD), which is used to display text messages. The LCD back light turns on, when any key is pressed, and will stay lit for approximately five minutes. For more information, refer to the Operation and Adjustments chapter.

Connectors (except the RS-232), terminal blocks and replacement parts are all mounted on the SM04 PCB.

2.1.2 Manual LVD Override Switches

Located next to the front panel LCD is a pair of rocker-style Low Voltage Disconnect (LVD) override switches (not shown). The purpose of these switches is to allow the user to manually bypass the SM04 control of the LVDs during maintenance procedures or during software upgrades, etc. The SM04 will record an alarm when the switch is placed in the IN position.

2.1.3 Communication Ports

2.1.3.1 RS-232

An RS-232 DB-9 serial port (not shown) is provided on the front panel of the SM04 for communications with a local terminal.

2.1.3.2 RS-485

An RS-485 RJ-type serial port is provided on the SM04 for communications with Argus' Pathfinder rectifiers.

2.1.3.3 Telco

A telephone port is provided on the SM04 to connect to an optional internal modem.

2.1.4 DC Input Protection

Two DC input fuses (see Specifications), located on the motherboard, protect the SM04's power supply.

2.1.5 Lithium Battery Backup

A removable lithium battery (see Specifications) is included in the system to retain time and date settings upon power loss or reset.

2.1.6 Analog/Digital Input Channels

2.1.6.1 Analog Channels

The SM04 has six analog input channels, including: two voltage, two current, and two temperature. Three virtual analog inputs are available for battery charge current, total rectifier output and total system load.

Voltage Inputs – two voltage-input channels, V1 and V2, provide monitoring of load (fixed) and converter voltage (optional).

Current Inputs – two current-input channels, A1 and A2, provide monitoring of load and converter current (optional).

Temperature Inputs – two temperature-input channels, T1 and T2, are provided for temperature sensor measurements. These may be used for temperature compensation function.

2.1.6.2 Digital Channels

The SM04 can accommodate up to six digital input channels. Some of these channels are pre-assigned to monitor specific signals.

Each digital channel can be configured for 0-to-5 or 0-to-65 Volt digital signals, depending on the placement of a jumper located behind each terminal block – see Table B for specific levels and drawing 018-543-06 for jumper locations.

These channels can monitor digital alarm/control signals from rectifiers, converters and many other types of equipment. Refer to Installation chapter for wiring and configuration details.

2.1.7 Alarm and Control Output Relays

The SM04 contains eight standard Form C digital alarm output relays to extend alarms and control external apparatus. Each internally generated alarm or control signal may be mapped to any one of the eight outputs, or, several signals may be mapped to just one output or none at all. Refer to the Operations chapter for more information on alarm mapping.

2.1.8 SM04 System Fail Alarm

The SM04 system fail alarm activates as a result of a major internal failure. During such a condition, the unit will attempt to reset itself, but if this fails, an alarm condition will be extended to a relay and the red LED on the front panel will illuminate. This is a fail-safe signal to the remote monitoring equipment; i.e. alarm will be extended even if power to the unit is interrupted.

2.2 Software Features

2.2.1 Password Security

Password security is available for configuration. Password access allows read/write capabilities for most menu items including the ability to change rectifier functions. Refer to the Operations chapter for instructions on entering and changing passwords.

2.2.2 Software Configuration Loading and Updates

Factory software updates are possible through EPROM replacements.

2.2.3 Battery Temperature Compensation (Temp Comp)

User must choose either Temp Comp or Auto Equalize or neither but cannot choose to enable both functions.

The automatic battery temperature compensation will only function with the Pathfinder series of rectifiers. Two temperature inputs are available on the SM04 motherboard for monitoring the battery string. Temperature sensor readings can be displayed on the LCD in either Celsius or Fahrenheit scales.

2.2.3.1 Theory of Battery Temperature Compensation

Battery life expectancy and performance is directly related to " **battery ambient temperature**." The optimum temperature for battery operation is 25°C (77°F). Without compensation, battery *life* is seriously compromised at temperatures above 25°C, while battery performance is reduced below it. Making adjustments to the battery's float voltage to correspond with temperature fluctuations will ensure maximum battery performance and life expectancy. With the SM04, this may be accomplished by using the software's built-in automatic temperature compensation function.

Temperature compensation occurs at standard rates commonly referred to as " **slope compensation**" settings. For maximum performance, **it's important to match the battery slope compensation with the setting recommended by the battery manufacturer.** This is not to be confused with **" slope regulation"**, which refers to the process of regulating current among a group of parallel-operating rectifiers.

The temperature compensation feature has programmable " **breakpoints**." These are the points at which temperature compensation will cease. Further temperature decreases or increases will NOT increase or decrease the output voltage. This protects the connected load from excessive voltage conditions.

The temperature compensation feature incorporates fail-safe circuitry to prevent it from driving the rectifier system to a voltage higher than is suitable for the load or battery. The SM04 can accommodate up to two sensors for temperature monitoring.

The SM04 uses the highest reading from all enabled temperature sensors. If any sensor fails or does not agree within a temperature range of 5°C (9°F), temperature compensation will be disabled and the system will reset to the nominal float voltage of 25°C (77°F). The temperature compensation feature can be enabled or disabled in the SM04's "Batteries" menu. For information on making temperature compensation adjustments, refer to the Operations chapter.

2.2.4 Battery Autoequalization

Autoequalize is a feature designed to ensure optimal battery life and performance. With the SM04, autoequalize is used for two basic reasons: first, for providing a quick battery recharge after an AC power failure, and second, as a long-term battery maintenance solution.

Autoequalize can be used after a prolonged AC power failure, when the battery voltage has decreased to a low level. Once the batteries have decreased beyond the autoequalize "low voltage threshold," the SM04 will enter into "armed" mode. When AC power returns, the system voltage begins to increase, which charges the batteries. Once the system voltage increases to the "high voltage threshold," the SM04 enters the equalize mode and begins to equalize or "boost" charge the batteries for a period of time specified by the user in the AUTOEQUALIZE DURATION submenu.

Autoequalize can be also used for maintaining the long-term integrity of a battery string. Over time, individual battery cell voltages may vary greatly. As a result, to ensure that batteries remain in optimum condition, they should be equalize charged at regular intervals. The SM04 allows the user to program the time between automatic equalize charging of the battery string in the AUTOEQUALIZE INTERVAL submenu.

WARNING
Refer to battery manufacturer's recommendations for equalization charging.

2.3 Menu Descriptions

The following section describes each of the SM04's menu items, including alarms, controls and configuration items. They are arranged as they would appear in the LCD menu subject to product enhancements. For a graphical representation of the SM04 software, command and menu structure, refer to the menu structure or "menu tree" (Setup Guide). Instructions on how to program and adjust parameters can be found in the Operations chapter.

2.3.1 Analog Input Setup

Alarms are assigned to each analog channel with a programmable level or threshold. When the level is reached a corresponding alarm message is displayed and the alarm condition is activated; e.g. V1 HGH1 ALM for high voltage 1 on voltage channel #1.

The alarm condition can then be programmed to either the power major (red LED and relay K5) or power minor (yellow LED and relay K4). It may also be programmed to one of the other unused relays.

The sub-menus can provide, where applicable, the means to:

- enable or disable the associated channel or alarm
- change the text string as displayed
- choose an input range
- calibrate the input by adjusting the channel offset and scale
- set high alarm levels for voltage, current and temperature
- set low alarm levels for voltage inputs.

2.3.1.1 System Voltage (SYS VOLT V1)
Displays system voltage. This channel is used for LVD 1 and 2 control purposes.

2.3.1.2 System Current (SYS LOAD A1)
Normally connected to the system discharge shunt and is used to display load current.

2.3.1.3 Converter Voltage (CONV VOLT V2)
Normally used to display a secondary DC-DC converter system voltage.

2.3.1.4 Converter Current (CONV LOAD A2)
Normally used to display a secondary DC-DC converter system current.

2.3.1.5 Total System (TOT SYS C1)
Provides reading from A1 or A2. Also provides the capability to add the two current inputs together (A1 and A2) to provide a total system current reading.

2.3.1.6 Total Rectifier (TOT RECT C2)
Mathematical addition of the total currents produced by the rectifiers.

2.3.1.7 Battery Current (BATT CHG C3)
Mathematical subtraction of the currents: C3 = C2 - C1.

2.3.1.8 Battery Temperature (BATT A, T1)(BATT B, T2)
Normally used to display battery temperature with redundant probes. Also used for temperature compensation reference.

2.3.1.9 Source (A1, A2, C1, C2, C3)
Provides the ability for the user to choose which current measurement will be displayed in the window of the LCD display during normal operation.

2.3.2 Alarm Log
This function displays the 5 most recent alarm messages; 1. MSG TEXT to 5. MSG TEXT. The messages are overwritten using FIFO (first in = first out).

2.3.3 Rectifiers
This menu category consists of rectifier alarms and controls. Operators can set/access parameters such as float/equalize voltage, high/low volts alarms, slope regulation, start delay.

2.3.3.1 Float Voltage (FL VOLT)
This function allows the user to set the system “FLOAT” voltage to the desired value.

Normally, the power system will operate in the float mode, where the rectifier’s output voltage is determined by the level programmed under this function.

2.3.3.2 Equalize Voltage (EQ VOLT)
This function allows the user to set the system “EQU” voltage to the desired value.

Equalize voltage charges the battery string at a higher than normal voltage to either recharge batteries after a power failure or to balance individual cell voltages. Periodic equalizing of the battery string may be required to optimize battery performance and life.

For LOADSHARE INITIALIZE to perform optimally, the slope setting should be set to 1.00%.

2.3.3.3 Slope Adjust (SLOPE ADJ)

This function sets all connected rectifiers to the same slope adjustment value (see Pathfinder manual for detailed explanation of slope adjustment procedure).

2.3.3.4 Current Limit (I LIMIT)

This function sets the level at which current limiting activates in all connected rectifiers (see individual Argus rectifier manual).

Current limiting is a primary response to output over-current situations. If the output current on the rectifiers exceeds the current limit setting, the rectifier's output voltage will automatically decrease, but will maintain the current output at the current limit level. This prevents potential damage to the rectifiers and system.

2.3.3.5 Start Delay (STRT DLAY)

This function controls the stagger-start timer for all connected rectifiers. With start delay, rectifiers start up in time-delayed sequence. This prevents excessive loading of the AC source. The programmable time delay range is from 1 to 250 seconds. For example, setting a start delay time of 5 seconds will cause rectifier#1 to start at 1 second, rectifier#2 at 5 seconds, rectifier#3 at 10 seconds, etc. If set to 1, then all rectifiers start at the same time.

The equalize duration setting in the SM04 Autoequalize menu overrides the EQ TO setting programmed in the rectifier.

2.3.3.6 Over Voltage Protection (OVP)

This function allows the user to program one OVP setting for all the connected rectifiers. This feature is used to shut down a rectifier if it's output voltage exceeds this setting.

2.3.3.7 High Voltage Alarm (H VLT ALM)

This function allows the user to program one HVA setting for all connected rectifiers.

2.3.3.8 Low Voltage Alarm (L VLT ALM)

This function allows the user to program one LVA setting for all connected rectifiers.

2.3.3.9 Rectifier Security Code (SECURITY CODE)

This function allows the user to program one security access code for all connected rectifiers.

2.3.3.10 Backlight Time-out (BKLGHT TO)

This function controls the LCD backlight time-out setting for all connected rectifiers.

2.3.3.11 Temperature Display Scale (SCALE C/F:)

This function sets the same temperature display scale for all connected rectifiers.

2.3.3.12 Current Limit Alarm (I LIM ALM)

This function allows the user to enable or disable the current limit alarm. This alarm, if enabled, is extended to the SM04 anytime a rectifier enters the current limit mode.

2.3.3.13 Equalize Time-out (EQ TO)

This function controls the maximum equalize (or "boost" charge) time setting for all connected rectifiers. This control is designed to prevent accidental overcharge of the batteries. This setting forces the rectifier to return to the float mode once the time-out expires.

If the SM04 fails during autoequalize, the rectifier equalize time-out will return the rectifiers to float mode to prevent battery overcharge.

Temperature compensator and automatic equalize must be disabled during load-share or download routines.

2.3.3.14 Loadshare Initialize (LOADSHARE INIT)

Automatic load-sharing initiates once the user presses the Enter key. This operation can take several minutes to complete. Load-sharing will balance current output within 5% or rated output of each rectifier.

2.3.3.15 Settings Initiate (DOWNLOAD & SAVE)

This function saves all of the Rectifier menu item parameters to the SM04 memory. It then downloads each new parameter separately to the rectifiers. This process can take several minutes to complete. This function is particularly useful when adding a new rectifier to a power system. This function also performs voltage adjustments and load-sharing.

2.3.3.16 Initiate Inventory Update (INVENTORY UPDATE)

This command prompts the SM04 to poll all connected rectifiers to ensure their status file information matches the setting parameters in the SM04. It is also forces an inventory update. This clears the SM04 memory of active units and re-acquires them. This must be done when a rectifier is removed from service to clear the Rectifier Fail Alarm.

2.3.4 Digital Inputs

This function allows the user to view the status and configure the digital inputs.

Digital events occurring on one of the digital inputs can be programmed to the output alarm relays using the programming feature for the relay contact similar to analog alarms.

The sub-menus can provide, where applicable, the means to:

- enable or disable the associated input
- change the text string as displayed
- choose active high or active low logic response (see Installation chapter).

2.3.5 Relay Outputs

This function allows the user to view the status and configure the relay outputs.

The sub-menus can provide, where applicable, the means to:

- enable or disable the associated output
- change the text string as displayed
- choose active high or active low logic response (see Installation chapter)
- choose from a list of alarms or "map" one or more alarms to trigger the associated relay.

2.3.6 Low Voltage Disconnect/Connect Alarm-Controls (LVD1, LVD2)

The LVD feature controls a relay that disconnects the load during extremely low voltage conditions – such as an extended AC failure – and automatically reconnects the load once AC power returns. Discharging the battery down to an extremely low voltage can cause load damage as well as over discharge of the battery.

With the SM04, the user can program connect/disconnect settings to govern the operation of two separate LVD controls (i.e. LVD1 and LVD2). The LVD also extends an alarm signal and the message LOW VOLTAGE DISCONNECT 1 (or 2) will display on the LCD.

The sub-menus can provide, where applicable, the means to:

- enable or disable the associated LVD
- set the OUT levels to disconnect the load
- set the IN levels to reconnect the load.

2.3.7 Batteries

This menu category consists of battery controls. Operators can set/access parameters such as automatic temperature compensation and auto equalize. Please consult the data supplied by the battery manufacturer.

2.3.7.1 Temperature Compensation (TEMP CMP)

Temp Comp Enable/Disable – this function allows the user to enable or disable the SM04's temperature compensation feature (see Software Features section for explanation of temperature compensation).

Slope – this function allows the user to program the slope compensation rate (see Software Features section and Operations chapter for more information).

Upper/Lower Breakpoints (UPR BRKPNT, LWR BRKPNT) – this function allows the user to program the temperature at which automatic voltage changes in the system will cease (see Software Features section for more information).

Interval – this function allows the user to program the time, in minutes, between corresponding voltage adjustments.

Sensor (1 and 2) Enable/Disable – this function allows the user to enable or disable operation of the corresponding temperature sensor. Up to two temperature sensors can be connected to the SM04 (see section on Battery Temperature Compensation for more information).

2.3.7.2 Autoequalize

When autoequalize is enabled the front panel ENTER key will toggle between interval function and duration function.

Enable/Disable - this function allows the user to enable or disable the SM04's auto equalize feature. See Software Features section for an explanation of battery autoequalization.

Interval – this function allows the user to program the time between automatic equalize charging of the battery string (see Software Features section for more information). Consult battery manufacturer for suggested equalize charge time interval.

Duration – this function allows the user to program the duration of the auto equalize cycle (see Software Features section for more information). Consult battery manufacturer for suggested duration of equalize charge cycles.

High Voltage Threshold (HV LIMIT) – this function allows the user to program the voltage at which the autoequalize charging will activate (see previous). Normally this value is set slightly below the normal float voltage.

Low Voltage Threshold (LV LIMIT) – this function allows the user to program the voltage at which the autoequalize charging will "arm" (see previous). Normally this value is set at a voltage level representing a significant discharge of the battery.

2.3.8 Configuration

This menu category consists of miscellaneous system identifiers and calibration controls. Operators can set/access time and date clocks, software notes, passwords, etc. This is also where the operator calibrates the analog input channels.

2.3.8.1 Software Version (VERSION)

This is where the SM04's software version number is displayed.

2.3.8.2 Software Timestamp (TS mmm dd yyyy)

This is where the SM04's software creation date is displayed.

2.3.8.3 Rectifier ID's

This is where the serial numbers of all connected rectifiers are displayed.

2.3.8.4 Supervisor Code (SET SUP. CODE)

This function allows the operator to program a supervisor password. Passwords can be entered as alphanumeric, and once set, cannot be modified unless accessed with a supervisor password.

2.3.8.5 Alarm Scroll Rate (SCROLL RATE)

This setting determines how long each alarm message is displayed on the LCD.

2.3.8.6 SM04 Temperature Display Scale (TEMP SCALE: C/F)

This function allows the user to toggle between Fahrenheit and Celsius display scales used for the SM04's temperature compensation feature.

2.3.8.7 Reset Settings

Reset the SM04 to factory default settings based on the voltage detected at V1. Input less than 35V defaults to 24V, greater than 35V defaults to 48V.

Text changes made by the user are not reset to factory defaults.

2.3.9 Communications

This menu category consists of rectifier communications controls. Operators can set/access rectifier baud rates, etc.

2.3.9.1 Rectifier Baud Rates (RECT RATE)

This function sets the baud rate (select from 1200/2400/4800/9600/19200/38400) at which the rectifiers communicate with the SM04.

3 INSPECTION

3.1 Packing Materials

All Argus products are shipped in rugged, double walled boxes and suspended via solid polyurethane foam inserts to minimize shock that may occur during transportation. Packaging assemblies and methods are tested to National Safe Transit Association (NSTA) standards.

Products are also packaged with Cortex. This plastic wrap contains a corrosive-inhibitor that protects the system from corrosion for up to two years.

3.1.1 Returns for Service

Save the original shipping container. If the unit needs to be returned for service, it should be packaged in its original shipping container. If the original container is unavailable, make sure the unit is packed with at least three inches of shock-absorbing material to prevent shipping damage. Argus Technologies is not responsible for damage caused by the improper packaging of returned units.

3.2 Check for Damage

Prior to unpacking the equipment, note any damage to the shipping container. Unpack the equipment and inspect the exterior for damage. If any damage is observed contact the carrier immediately.

Continue the inspection for any internal damage. In the unlikely event of internal damage, please inform the carrier and contact Argus Technologies for advice on the impact of any damage.

Verify that you have all the necessary parts per your order for the proper assembly of your system.

4 INSTALLATION

The SM04 must be mounted in a clean and dry environment.

This chapter is provided for qualified personnel to prepare the SM04 for wiring and setup.

4.1 Preparation and Mounting

The SM04 is available in two versions: rack (Figure 1) and door mount (Figure 3).

4.1.1 Rack Mount (stand-alone)

The rack models are designed for mounting in a 19" or 23" EIA relay rack as shown in drawing #018-543-06.

The SM04 should be mounted to the rack using two, #12 – 24 x 1/2", screws in each bracket. A captive type of drive, such as the Philips head, is preferred to reduce the possibility of slippage and scratching of the unit's exterior.

4.1.2 Door Mount

The door version mounts inside an Argus integrated distribution center. The preparation and mounting is done at the factory.

Figure 3–Front view of SM04 door mount version

To aid the user with installation, frequent reference is made to foldout drawings located at the rear of the manual.

5 WIRING AND CONNECTIONS

Connections to the supervisory panel should comply with all local electrical codes and ordinances.

WARNING

Ensure that input power and output power is removed before attempting work on the SM04's wiring connections.

For safety reasons, ensure the SM04's cabinet is properly bonded to the building's ground grid.

Both the SM04 chassis ground via power system chassis ground and common return must be connected to the site ground to ensure correct operation of the SM04 and to prevent drifting floating analog (especially current) readings.

Terminal blocks can accommodate wire sizes per the specifications section near the front of this manual. All cables should be routed through the access holes, bundled together with clips and clamped directly into applicable terminal blocks.

For the stand-alone SM04, all wiring connections are accessible through the top. To gain access to the terminal block connectors, loosen the cabinet's rear screws and remove the rear plate (see drawing 018-543-06).

For the door mount SM04, all wiring connections are accessible through the front door of the integrated distribution center. To gain access to the terminal block connectors, loosen the cabinet's front screws and swing the door open (see Figure 4 and drawing 018-543-06).

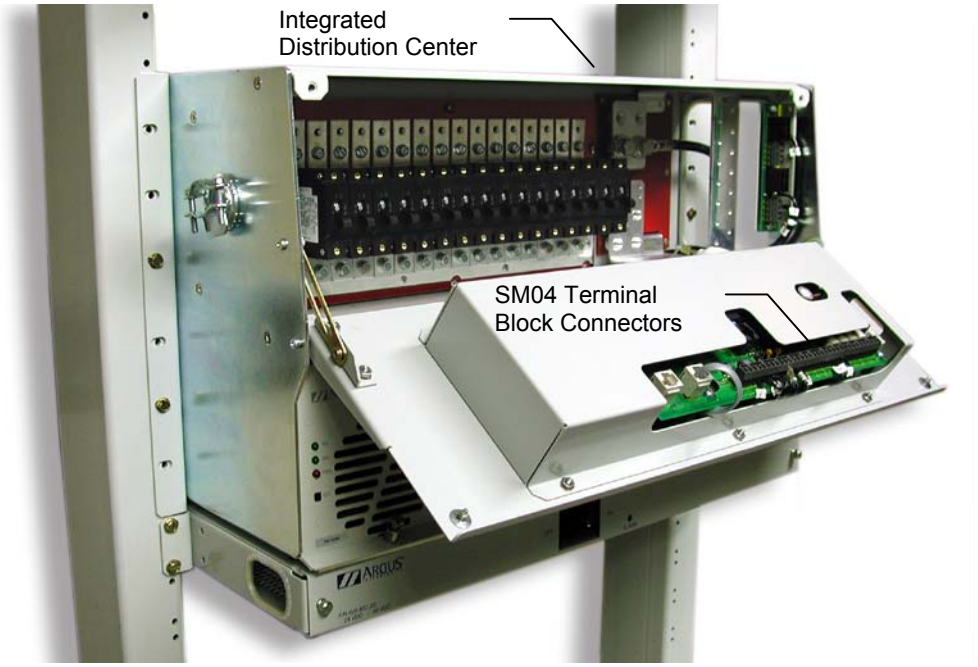


Figure 4–Showing location of terminal block connectors, SM04 door mount

5.1 Tools Required

Various tools are essential for product installation. Use this list as a guide:

- Slot head screwdriver (blade size 1/4")
- Slot head screwdriver (blade size 1/8")
- Philips head screwdriver, #2 (tip size 3/16")
- Anti-static wrist strap
- Cutters and wire strippers (#14 to #22 AWG) [0.34 to 2.5 mm^2].

WARNING For safety reasons, ensure the tools used are properly insulated. Extreme caution must be used to ensure that any exposed metal on tools does not contact hot and ground points in the system causing a short circuit.

Refer now to drawing 018-543-06 (foldout drawings located at the rear of the manual).

5.2 Power Connections

System can operate from a ±24 or ±48VDC input with no configuration required.

The SM04 cannot function without DC power to the motherboard. Power must be connected as follows:

1. Connect system (+) power bus lead to (+) TB1-24
2. Connect system (-) power bus lead to (-) TB1-23
   (see Table A and drawing 018-543-08, for more detail).

For systems equipped with battery disconnect, the secondary power source input TB1-21 (-) and TB1-22 (+) must be used to provide an alternate power source to maintain the SM04 operation during an extended power outage. Connect as follows:

1. Connect system (+) power bus lead to (+) TB1-22
2. Connect system (-) power bus lead to (-) TB1-21
   (see Table A and drawing 018-543-08, for more detail).

5.3 Analog Input Connections

WARNING Ensure the correct polarity is used for all input cable terminations.

The analog input channels are used to monitor various types of electrical signals. The analog channels are reserved for specific signals. The input cables should be bundled together and routed through the cabinet's entry holes, if applicable.

Default configurations and terminal numbers described below have been summarized in Table A (next page). Refer also to foldout drawings located at the rear of the manual.

5.3.1 Voltage and Current Connections

Terminal TB1 5-8, provides connections for system and converter voltages and TB1 9-12 for current.

To aid the user with installation, frequent reference is made to foldout drawings located at the rear of the manual.

5.3.2 Temperature Sensor

Terminal TB1 1-4, provides connections for up to two temperature sensors. For example, to connect a temperature sensor to T1 temperature terminal:

1. Connect positive (+) wire from sensor to TB1-2.
2. Connect negative (-) wire from sensor to TB1-1.
3. Connect shield wire to ground stud located adjacent to terminal blocks (see page 1 of drawing 018-543-08).
4. Attach sensor directly to negative (-) post on the middle of the battery string or in appropriate location (away from drafts, etc.) if measuring room temperature.

** See Table B for logic definitions.*

*** Output relays are in a de-energized condition. During an alarm or control condition, relays will energize.*

**** See drawing 018-543-08 for more detail.*

Terminal #	Description	Signal Type	Range	Jumper
TB1-1 and 2	Temp. Input 1	Neg (-) or Pos (+)	Temp	N/A
TB1-3 and 4	Temp. Input 2	Neg (-) or Pos (+)	Temp	N/A
TB1-5 and 6	Voltage Input 1	Neg (-) or Pos (+)	0—65VDC	N/A
TB1-7 and 8	Voltage Input 2	Neg (-) or Pos (+)	0—65VDC	N/A
TB1-9 and 10	Current Input 1	Neg (-) or Pos (+)	±0—50mV	N/A
TB1-11 and 12	Current Input 2	Neg (-) or Pos (+)	±0—50mV	N/A
TB1-13 and 14	Digital Input 1	Neg (-) or Pos (+)	0—65VDC*	N/A
TB1-15 and 16	Digital Input 2	Neg (-) or Pos (+)	0—65VDC*	N/A
TB1-17 and 18	Digital Input 3	Neg (-) or Pos (+)	0—65VDC*	N/A
TB1-19 and 20	Digital Input 4	Neg (-) or Pos (+)	0—65VDC*	N/A
TB1-21 and 21	Secondary Power	Neg (-) or Pos (+)	20—60VDC	N/A
TB1-23 and 24	Power	Neg (-) or Pos (+)	20—60VDC	N/A
TB1-25 and 26	Output 1**	NC or NO	60VDC / 1A	Selectable***
TB1-27 and 28	Output 2**	NC or NO	60VDC / 1A	Selectable***
TB1-29 and 30	Output 3**	NC or NO	60VDC / 1A	Selectable***
TB1-31 and 32	Output 4**	NC or NO	60VDC / 1A	Selectable***
TB1-33 and 34	Output 5**	NC or NO	60VDC / 1A	Selectable***
TB1-35 and 36	Output 6**	NC or NO	60VDC / 1A	Selectable***
TB1-37 and 38	Output 7**	NC or NO	60VDC / 1A	Selectable***
TB1-39 and 40	Output 8**	NC or NO	60VDC / 1A	Selectable***
P7	Digital Input 5	Open or Closed	N/A	N/A
P8	Digital Input 6	Open or Closed	N/A	N/A

Table A–SM04 wiring summary

5.4 Digital Input Connections

The digital input channels (TB1 13-20) are used to monitor various alarm and control signals. All input channels are voltage activated and accept a bipolar (i.e. negative or positive) DC signal directly.

Voltage Range (VDC)	Voltage Level (VDC) Considered As "0" (Off)	Voltage Level (VDC) Considered As "1" (On)
0—65 (system voltage setting)	0—3	18—65

Table B–Voltage level definitions

Digital input 5 (P7 on the motherboard) is factory set to provide: monitoring of Low Voltage Disconnect #1 and control in LVD1.

Digital input 6 (P8 on the motherboard) is factory set to provide: monitoring of Low Voltage Disconnect #2 and control in LVD2.

5.5 Relay Output Connections

Terminals TB1 25-40 provide eight Form C contacts for extending various alarm or control signals. Relay contacts are high capacity and are intended to be used for controlling LVD contactors. Each relay output can be wired for NO or NC operation during an alarm or control condition (see drawing 018-543-08).

Relays K1 and K2 are factory set (default) for LVD control.

Relay K4 is set for Power System Minor Alarm and activates the Yellow Power System Minor Alarm LED. Relay K5 is set for Power System Major Alarm and activates the Red Power System Major Alarm LED.

Relay K6 is factory set for AC Fail Alarm.

Relays K3, 7 and 8 may be reprogrammed to meet the system requirements.

All alarm conditions should be programmed to the appropriate relay.

5.5.1 LVD Control

The LVD control functions can be hardwired directly from the assigned relay output channels (see Table F) to the LVD contactor panel.

5.6 Rectifier Connections

The RS-485 port allows communications between the SM04 and Pathfinder Series rectifiers; daisy-chain to subsequent units.

6 GETTING STARTED

Refer also to the SM04 setup card: Argus #954-397-10 to guide you.

The following section is for qualified personnel to startup and test the SM04.

6.1 Basic Turn Up and Test

1. Initiate startup routine by inserting or turning rectifier(s) ON. The SM04 will perform a short self-test as it boots up.
2. Alarm conditions are normal and may take several minutes to clear.
3. Check and adjust alarms and control levels in the SM04's submenus.
4. Perform INITIATE INVENTORY UPDATE procedure.
5. Check and adjust settings in the RECTIFIERS submenus; e.g. float, equalize voltage, etc.
6. Perform DOWNLOAD AND SAVE procedure.
7. Program the SM04's TEMP COMP and AUTOEQUALIZE settings as needed.
8. Verify COMMUNICATIONS settings as needed.
9. Test relay OUTPUT ALARM/CONTROLS as needed; e.g. PS Major Alarm.

7 OPERATION AND ADJUSTMENTS

Illumination of the front panel LED's is normal as the system status is displayed; i.e. Green for system OK.

7.1 Startup Procedure

When the SM04 is powered-up or reset, it will first perform a self-test before displaying the power system's parameters during "Normal" operating mode.

7.1.1 Resetting the SM04 Microprocessor

Depress the down arrow key, Enter, and Esc key at the same time to reset the SM04 microprocessor. This function is used to reboot the microprocessor without losing any stored settings.

7.1.2 Resetting the SM04 To Factory Defaults

Scroll to RESET SETTINGS in the CONFIGURATION submenu. Press Enter. This resets all settings to factory defaults including text and ranges. Calibration information is not lost.

The menu "tree" is shown on the SM04 setup card: Argus #954-397-10.

7.2 Menu Structure

The SM04 menu structure consists of two basic components: Menu Categories and Sub-Menu Items. To scroll through these items, press the up and down arrow keys to display the correct item and then press the Enter key to select that item/enter a submenu. At any time you may exit the current menu by pressing the Esc key).

7.3 Normal Operation

This is the default operating mode when the SM04 is not being interrogated. The LCD displays various system status information and monitors all input channels.

When the user attempts to scroll through the menu, he will be first prompted to enter a password. Once the password is verified, appropriate access will be granted. To be granted "viewer" access, the user must enter all characters as blanks for the password. In this mode, the user can navigate through menus, but cannot make changes to parameters.

7.4 Using Keys for SM04 Programming

The table below lists definitions for the keys on the SM04. You will need to use these keys when programming new parameters and user alarm triggering equations.

Key	Function
ESC	Escape or Exit/Abort key. Cancels current operation or returns to previous menu.
↵	ENTER/Select key. Enters command or permits access to submenu.
ALCO	Alarm Cut-off key. Used to silence audible alarms.
∧	Scroll up key.
∨	Scroll down key.

Table C–SM04 Key Definitions

7.5 Programming Access Codes (Passwords)

The SM04 provides two levels of operator access: view and supervisor.

7.5.1 View Access

This is the default access mode. In this mode, it's possible for the operator to view all menu items, but he cannot enter commands or change parameters. The user must enter all characters as blanks for the password.

7.5.2 Supervisor Access

This is the highest level of security access. In this mode, the operator can view, program and adjust all of the SM04's commands/parameters, including passwords. To enter this mode, the operator must first input a numerical password. The maximum number of characters that can be used is 6.

NOTE: If a password is less than 6 characters, the balance of the characters must be entered as blank.

NOTE: Once the supervisor password has been changed, the default password will no longer work. For security purposes, we recommend changing the supervisor password immediately upon installing the power system. Write the new password down and put it in a safe place. If you lose your supervisor password, consult an Argus customer service representative for assistance.

7.6 Programming System Operating Modes

The SM04 has two operation modes: float and equalize.

7.6.1 Float Mode

This is the SM04's default mode at start up and during normal system operation. When in this mode, the rectifier's charge (or output) voltage is controlled by the FLOAT VOLTAGE setting found in the SM04's RECTIFIERS menu. The message "FL" will display on the LCD's upper right corner when the SM04 is operating in float mode.

NOTE: Do not adjust the Float voltage of the rectifiers when they are in Current Limit or Power Limit.

7.6.2 Equalize Mode

The Equalize mode is used to equalize or "boost charge" a battery string (temperature compensation must first be disabled). This mode can be selected by holding down the enter key. When in this mode, the rectifier's charge (or output) voltage is controlled by the EQ VOLTAGE setting found in the SM04's RECTIFIERS menu. While making the transition from Float to Equalize mode, the message "FL" will flash on the screen and then the message "EQ" will display when the SM04 is operating in Equalize mode.

NOTE: A maximum time limit for equalize charging can be programmed to prevent accidental overcharge of a battery string. This limit is determined by the setting found In the Equalize Timeout menu. Do not adjust the equalize level of the rectifiers while they are In current limit or power limit.

7.7 Inventory Update

To initiate an inventory update in the RECTIFIERS menu:

1. Using the down arrow key, scroll to INVENTORY UPDATE.
2. Press the Enter key.
3. Once all the rectifiers have been acquired press any key to exit.

7.8 Programming Rectifier Settings Parameters

To adjust settings in the RECTIFIERS menu:

1. Using the down arrow key, scroll to the item to be changed; e.g. FLOAT VOLTAGE.
2. Press the Enter key.
3. Enter a new value using the SM04's up/down scroll keys.
4. Press the Enter key.
5. Repeat the steps above for any change to rectifier settings.

To immediately download new settings to all connected rectifiers:

1. Turn off temperature compensator and auto equalize.
2. Scroll to the submenu DOWNLOAD & SAVE.
3. Press the Enter key.
4. The SM04 will begin downloading new settings to the rectifiers immediately.

7.9 Initializing Rectifier Load-sharing Function

Turn off temperature compensator and auto equalize.

To balance the load evenly between rectifiers, use the LOADSHARE INITIALIZE function.

1. To immediately implement load-sharing among all connected rectifiers:
2. Turn off temperature compensator and auto equalize.
3. Scroll to the submenu item LOADSHARE INITIALIZE.
4. Press the Enter key. The SM04 will begin the load-sharing procedure immediately.

NOTE: When setting the Loadshare Initialize function, ensure the Slope Setting is set to 1.00% or greater (recommended for optimal load sharing).

7.10 SM04 Factory Defaults and Ranges

Submenu Item	Programmable Range	Default Setting (24VDC Systems)	Default Setting (48VDC Systems)
Float Voltage	10 – 70V	27.00V	54.00V
Equalize Voltage	10 – 70V	27.50V	55.00V
Slope Adjust	0 – 2%	1%	1%
Current Limit	18 – 125A	110A	70A
Start Delay	1 – 250 seconds	1 seconds	1 seconds
OVP	10 – 70V	29V	57.0V
HVA	20 – 70V	28V	55.5V
LVA	10 – 55V	22V	44V
Rect. Sec. Code	0 – 999	123	123
Backlight Timeout	1 – 60 minutes	10	10
Temp Display	Celsius/Fahrenheit	Celsius	Celsius
Current Limit Alm	Enable/Disable	Disable	Disable
Equalize Timeout	1 – 250 hours	30 hours	30 hours
Local Access Alm	Enable/Disable	Enable	Enable
Loadshare Init.	N/A	N/A	N/A
Settings Initiate	N/A	N/A	N/A
Initiate Inventory Update	N/A	N/A	N/A

Table D–Rectifiers Menu Defaults

Submenu Item	Programmable Range	Default Setting (24VDC Systems)	Default Setting (48VDC Systems)
HVA 1	20 – 70V	28V	55.5V
HVA 2	20 – 70V	29V	56.5V
LVA 1	10 – 55V	24V	48V
LVA 2	10 – 55V	23.25V	46.5V

Table E–Alarms Menu Defaults

Submenu Item	Programmable Range	Default Setting (24VDC Systems)	Default Setting (48VDC Systems)
LVD 1 OUT	10 – 55V	21V	42V
LVD 2 OUT	10 – 55V	21V	42V
LVD 1 IN	10 – 55V	25V	50V
LVD 2 IN	10 – 55V	25V	50V

Table F–Controls Menu Defaults

Submenu Item	Programmable Range	Default Setting (24VDC Systems)	Default Setting (48VDC Systems)
Temp Comp	Enable/Disable	Disable	Disable
Temp Comp Slope	0 – 4.5mV/cell/°C	2.5mV/cell/°C	2.5mV/cell/°C
Temp Comp Upper BP	-40 – 80°C	50°C	50°C
Temp Comp Lower BP	-40 – 80°C	0°C	0°C
Temp Comp Interval	1 – 10 minutes	10 minutes	10 minutes
Temp Comp Sensor 1	Enable/Disable	Disable	Disable
Temp Comp Sensor 2	Enable/Disable	Disable	Disable
Auto Equalize	Enable/Disable	Disable	Disable
Auto Equalize Interval	0 – 255 days	0	0
Auto Equalize Duration	0 – 255 hours	0	0
Auto EQ HV Threshold	10 – 70V	26V	52V
Auto EQ LV Threshold	10 – 55V	24V	48V

Table G–Batteries Menu Defaults

Submenu Item	Programmable Range	Default Setting (24VDC Systems)	Default Setting (48VDC Systems)
Rectifier Baud Rate	1200 – 38400 baud	9600 baud	9600 baud

Table H–Communications Menu Defaults

NOTE: If text label is less than 9 characters, the balance of the characters must be entered as blank.

Submenu Item	Programmable Range	Default Setting (24VDC Systems)	Default Setting (48VDC Systems)
Analog Input Calibration	See Calibration section	N/A	N/A
Supervisor Access Code	0 – 999999	1234	1234
Alarm Scroll Rate	1 – 99 seconds	3 seconds	3 seconds
SM04 Temp. Scale	Celsius/Fahrenheit	Celsius	Celsius

Table I–Configuration Menu Defaults

7.11 Changing Title Text String Labels

Most title text string labels are changeable and can be customized to indicate a particular alarm condition, or relay output label (maximum 9 characters). Any reoccurrence of labels in other menus will also be changed.

To change the text:

1. Scroll to the title string section of the target label in the SM04 menu tree.
2. Press the Enter key. You will see the first character flashing.
3. Use the up/down scroll keys to select the new character.
4. Press the Enter key. You will see the next character flashing.
5. Repeat steps 3 and 4 for ALL characters.

7.12 Miscellaneous Defaults/Adjustments/Controls

7.12.1 Adjusting the LCD Viewing Angle

Adjustment of the viewing angle/LCD contrast can only occur in the Normal Operation mode.

NOTE: In the event that the LCD is extremely light or dark, making it difficult to see where you are in the menu structure, press the Esc key 5 times to ensure that you are in normal operation mode.

Press and hold the Enter key. Then press the Esc key. Release the keys. Toggle the up/down scroll keys for best viewing. Press enter upon completion of adjustment to return to normal operation mode.

7.12.2 SM04 LCD Screen Defaults

After about 5 minutes of inactivity, the SM04 LCD screen will default back to normal operation mode.

7.12.3 Using the Manual Override Switch (Located on the LVD Panel)

This function allows the user to manually bypass the LVD contactor by placing the switch in the "IN" position. When in the "AUTO" position, the SM04 resumes automatic control of the LVD contactor. An alarm is extended each time the LVD contactor is disengaged. The Manual Override Switch allows operators to perform test and maintenance procedures on the SM04 without disturbing the load.

WARNING Do not leave the switch in the "IN" position. Doing so may result in a complete discharge of the batteries during a power failure situation.

7.12.4 Temperature Compensation Adjustments

1. Turn off Temperature Compensation.
2. Set rectifier float voltage to the setting recommended by battery manufacturer for 25ºC operation.
3. Download settings to rectifiers.
4. Set Temperature Compensation slope, upper and lower break points per battery manufacturer's guidelines.
5. Turn on temperature compensation.
6. Allow system voltage to stabilize after temperature compensation adjustments have been made – this may take up to 1 hour – check every 10 minutes.
7. Verify that battery float voltage is at the correct temperature compensated float voltage by using the following mathematical formula:

Vtemp.comp.
= slope x (25ºC - batt. temp. ºC) x number of battery cells + (normal battery float V @ 25ºC)

7.13 Configuring Input/Output Channels

Many of the SM04's input and output channels are assigned to send or receive specific analog or digital signals.

7.13.1 Input Channel Configuration

Entering into the menu for the input channels, the following configurations can be made:

V1/ V2/ A1/ A2/ T1/ T2 — press Enter to toggle between Enable/Disable.

7.13.1.1 Voltage Input Range

V1, V2 — analog input range is between 0-60VDC. If monitoring of a higher voltage is required (i.e. ±120V), a device can be used to reduce the measured voltage by 1/2 (120V) or 1/3 (180V). This reduced value can then be read by the SM04 as 0-60VDC. By selecting the I/P range (120, 180) the SM04 doubles (120) or triples (180) this value and displays the actual system voltage.

E.g. 126VDC (Actual system voltage) → 63VDC (Reduced voltage read by SM04) → 126VDC (Displayed by SM04)

7.13.1.2 Current Input Range

A1, A2 — simply adjust your input range to match the value of the shunt you are using to measure the current i.e. for 600A shunts, you set the range = 600.

7.13.2 Programming Analog Input Channels

The majority of the SM04's analog input channels are designed to accept a specific input signal. Refer to the table below and drawing 018-543-08 for channel assignment information.

Channel Description	Factory Default Designation
T1	Temp Sensor 1
T2	Temp Sensor 2
V1	System Volts
V2	Converter Volts
I1	System Load
I2	Converter Load

Table J–Analog Input Channel Assignments

7.13.3 Programming Digital Input Channels

Each digital input channel is designed to detect either a battery or ground (i.e. On/Off) signal as programmed. D1 through D4 have factory default designation but may be reprogrammed.

They can also be programmed as "active high" or "active low" inputs (alarm condition exists when signal is applied or not applied). D5 and D6 are assigned to LVD monitoring.

The following table summarizes the digital channel assignments:

Channel Description	Factory Default Designation
D1	System Fuse
D2	Battery Fuse
D3	Converter Fail
D4	Remote Shutdown
D5	LVD 1 In (P7)
D6	LVD 2 In (P8)

Table K–Digital Input Channel Assignments

7.13.4 Programming Relay Output Channels

Each relay output channel is controlled by triggering equations programmed into the SM04. The table below summarizes the output channel assignments:

Channel Description	Factory Default Designation
K1	LVD 1 Control
K2	LVD 2 Control
K3	User Assigned
K4	Power Minor Alarm
K5	Power Major Alarm
K6	AC Fail Alarm
K7	User Assigned
K8	User Assigned

Table L–Relay Output Channel Assignments

Under the RELAY OUTPUTS menu, relays can be programmed via the TRIGGER submenu of the associated relay. A list of alarm conditions can be "mapped" to each relay.

7.14 Analog to Digital Channel (A/D) Calibration Procedures

7.14.1 Tools Required

- 4 ½ digit digital multimeter (DMM), high impedance (10MΩ)
- Ice bath for temperature channel calibration only (place temp sensors in ice water).

NOTE: There are 6 analog input channels. These channels are calibrated at the factory before shipment. However, these channels may require calibration if different inputs or scaling factors from the original defaults are required. Periodic calibration may be required as part of the unit's maintenance.

WARNING

For safety reasons, ensure the tools used are properly insulated. User must avoid direct contact with any energized electrical termination.

Extreme caution must be used to ensure that any exposed metal on tools does not contact hot and ground points in the system causing a short circuit.

7.14.2 Voltage and Current Input Calibration

NOTE: Null calibration must be performed before scaling factor calibration.

NOTE: For V1 channel, you can observe changes on the display to the left of the current reading. For V2 channel, you must press the Esc key twice to exit calibration menu, then read adjusted channel voltage.

7.14.2.1 CH OFFSET Calibration (Zeroing)

1. Place LVD override switch into the IN position.
2. Remove target channels input wires and place shorting jumper across the input pins.
3. Scroll to the target channel calibration menu and press Enter.
4. Scroll to CH OFFSET and press Enter. Setting should start to flash.
5. Increase or decrease the setting accordingly to adjust reading to 0 and press Enter.
6. Repeat steps 4-5 (3-5 for V2 channel) until channel reading is 0.
7. Remove jumper wire and replace with channel input wires.
8. Ensure SM04 will keep LVD engaged when you place LVD override switch back into AUTO position.
9. Place LVD override switch into AUTO position.

7.14.2.2 CH SCALING

1. Place LVD override switch into the IN position.
2. Apply a known signal (voltage) to input of target channel.
3. Scroll to target channel calibration menu and press Enter.
4. Scroll to CH SCALE and press Enter. Setting should start to flash.
5. Increase or decrease the setting accordingly to adjust reading to known input value and press Enter.
6. Repeat steps 4-5 (3-5 for V2 channel) until channel reading matches known value.
7. Remove known signal and replace with channel input wires if necessary.
8. Ensure SM04 will keep LVD engaged when you place LVD override switch back into AUTO position.
9. Place LVD override switch into AUTO position.

7.14.3 Temperature Input Calibration

7.14.3.1 CH OFFSET Calibration (Zeroing)

1. Place LVD over-ride switch into the IN position.
2. Ensure SM04 is operating in CELSIUS mode.
3. Prepare Ice Bath (0ºC) by adding small amount of water to container filled with ice.
4. Remove temp sensor from battery string and immerse in ice bath.
5. Scroll to the specific analog channel and then to the sub-level calibration.
6. Adjust up or down.
7. Press Enter to read the correct value (0ºC).
8. Ensure SM04 will keep LVD engaged when you place LVD override switch back into AUTO position.
9. Place LVD override switch into AUTO position.

7.14.3.2 CH SCALING

Follow same scaling factor procedure as Voltage and Current Inputs.

7.15 Alarms

7.15.1 Voltage Channels

Four alarms are available for each voltage input channel: High Voltage 1, High Voltage 2, Low Voltage 1, Low Voltage 2. Each alarm can be enabled or disabled and the setting can be adjusted from the appropriate submenu of the channel alarms menu.

7.15.2 Current Channels

All current channels have only a HIGH CURRENT alarm. The alarm can be enabled or disabled and the setting can be adjusted from the appropriate submenu of the channel alarms menu.

7.15.3 Temperature Channels

All temperature channels have only a HIGH TEMPERATURE alarm. The alarm can be enabled or disabled and the setting can be adjusted from the appropriate submenu of the channel alarms menu.

7.15.4 Virtual Channels (C1, C2, C3)

The alarm can be enabled or disabled, and the setting can be adjusted from the appropriate submenu of the channel alarms menu. The text string can be changed.

C1 — can be selected to read current from channels A1, A2 or A1 plus A2 by selecting the particular input from the SOURCE menu.

C2 — a mathematically added value of each rectifier output current to give a total system rectifier output.

C3 — default as battery charge current, this value is calculated by subtracting C1 from C2, if C1 is used to measure current going into the load.

8 MAINTENANCE AND TROUBLESHOOTING

Although very little maintenance is required with Argus systems, routine checks and adjustments are recommended to ensure optimum system performance. Qualified service personnel should do repairs.

The following table lists a few maintenance procedures for this system. These procedures should be performed at least once a year.

WARNING

Use extreme care when working inside the cabinet while the system is energized. Do not make contact with live components or parts. HIGH VOLTAGE AND SHOCK HAZARD.

Ensure redundant modules or batteries are used to eliminate the threat of service interruptions while performing maintenance on the system's alarms and control settings.

Circuit cards, including RAM chips, can be damaged by static electricity. Always wear a grounded wrist strap when handling or installing circuit cards.

Refer to the specification section at the front of this manual for replacement parts.

Procedure	Date Completed
Clean ventilation openings	
Inspect all system connections (re-torque as necessary)	
Verify alarm/control settings	
Verify alarm relay operation	

Table M–Sample maintenance log

8.1 Fuse Replacement

Two fuses are located on the rear of the SM04's motherboard.

WARNING Exercise extreme caution and do not touch any connected equipment.

To replace fuses, remove the unit's rear cover (if applicable) and pull the fuses out carefully. Ensure new fuses are the same as the ones being replaced.

8.2 Troubleshooting

To use the following troubleshooting guide, look for the specific symptom that you are experiencing:

Symptom	Solution
Rectifier Communications Lost (RECT COMMS LOST)	Check RS-485 cable connections for breaks and loose contacts. Ensure all rectifiers are secured and tightly screwed in to the shelf. Perform INVENTORY UPDATE (from RECTIFIERS menu).
Rectifier Lockout (RECT LOCKOUT)	Rectifier modules with LCD option: Check if any rectifiers menu has been accessed. Set all rectifiers for Remote Access enabled and Remote Adjust Access enabled.
Rectifier Out Of Tolerance (OUT OF TOLERANCE)	Check all settings in RECTIFIERS menu; e.g. Float Voltage, Equalize Voltage, etc. Ensure all parameters are properly set. Select DOWNLOAD & SAVE from RECTIFIERS menu.
Download & Save Fails (DOWNLOAD ABORT)	Check all settings in RECTIFIERS menu. Ensure all settings are within acceptable parameters; e.g. OVP is set at least 1.5V above Float and Equalize. Disable Temp Comp and sensors. Enable, if needed, when download is complete. Disable AUTOEQUALIZE. Enable, if needed, when download is complete.

Table N–Trouble-shooting Guide

9 ARGUS CONVENTIONS

9.1 Numbering System

Argus Technologies uses an eight digit drawing number system, which is broken into three blocks. The first three digits describe the category of the product; e.g. rectifier or fuse panel. The next three digits indicate the sequence in which the product number was allocated in a particular category. The last two digits indicate the type of drawing, for example:

"-05" Schematic

"-06" Outline Drawing

"-20" Main Assembly

Argus uses an eight-digit part numbering system for all components and sub assemblies. Each part is covered by its own unique number. Due to the quantity, categories will not be listed within this manual.

9.2 Acronyms and Definitions

AC Alternating current

ALCO Alarm cutoff

AWG American wire gauge

DC Direct current

EIA Electronic Industries Association

ESC Escape

LED Light emitting diode

LCD Liquid crystal display

LVA Low voltage alarm

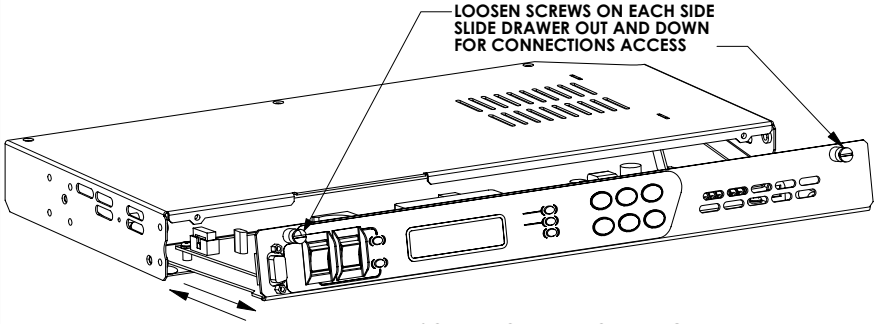
LVD Low voltage disconnect

NC Normally closed

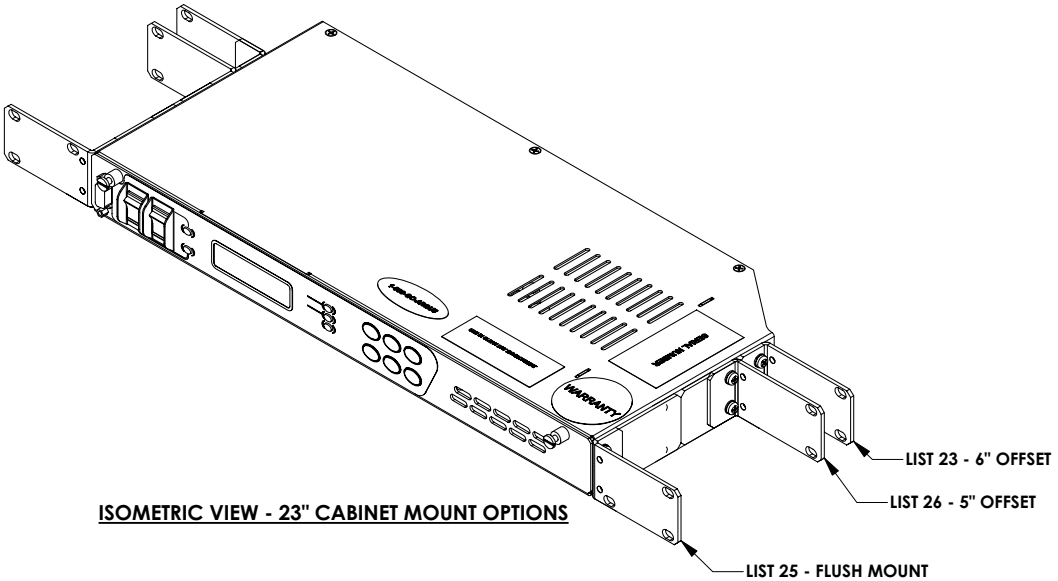
NO Normally open

RU Rack unit (1.75")

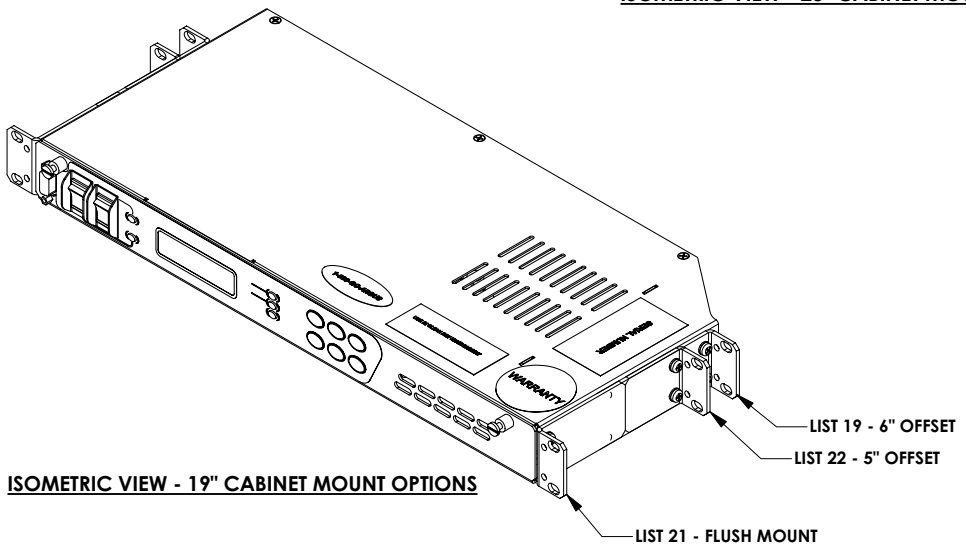
REVISIONS			
LTR	DESCRIPTION	DATE	APPD



ISOMETRIC VIEW - OPENING DETAIL



ISOMETRIC VIEW - 23" CABINET MOUNT OPTIONS



ISOMETRIC VIEW - 19" CABINET MOUNT OPTIONS

DIMENSIONS ARE IN INCHES WITH METRIC [mm] IN BRACKETS: INCHES [mm]

LTR	DESCRIPTION	QTY
	FINISHED HOLE LEGEND	

ARGUS TECHNOLOGIES

DESIGN	C.A.	2001/10	MATERIAL
DRAWN	J.U.	2001/10	
CHECKED			
APPROVED			FINISH

TOLERANCES
X.X ±0.04" [X] ±1mm
X.XX ±0.02" [X.X] ±0.5mm
X.XXX ±0.01" [X.XX] ±0.25mm

PER P.O. and Doc. 070-024-83

SCALE **N.T.S.**

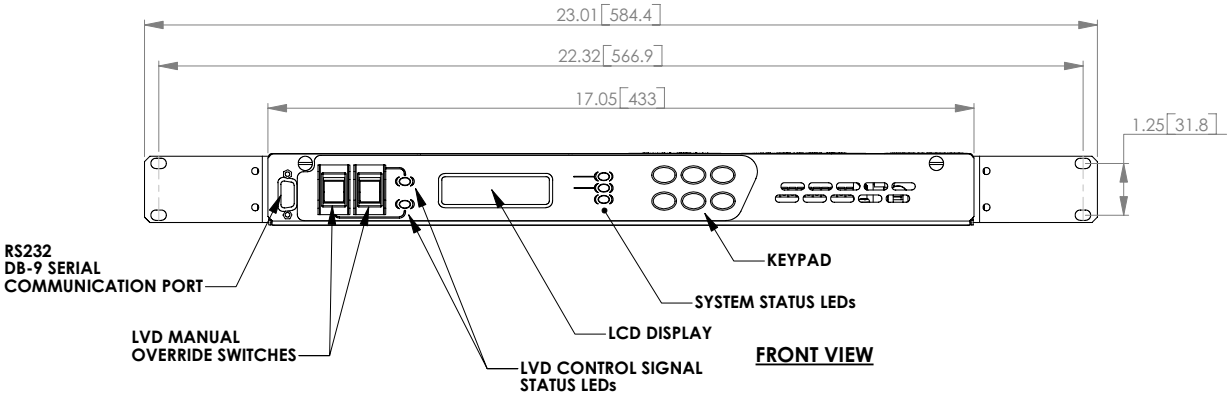
TITLE
OUTLINE, BAFFLE MOUNT
SM04

ISSUE DATE

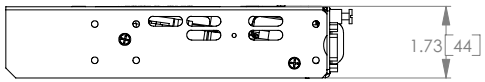
SHEET 1 OF 3

SIZE	TYPE	DWG NO.	REV
B	D2	018-543-06	A

REVISIONS			
LTR	DESCRIPTION	DATE	APPD

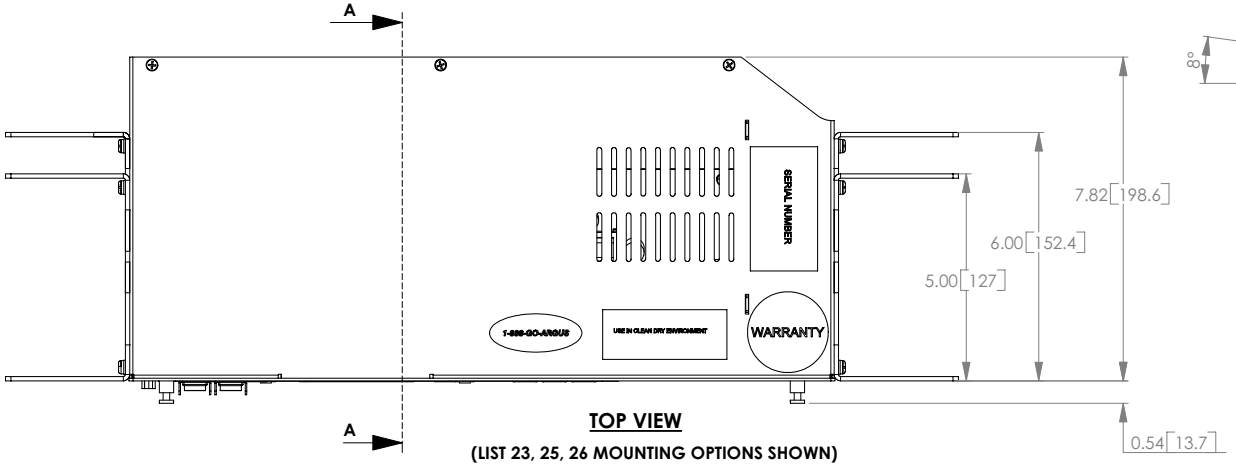


FRONT VIEW



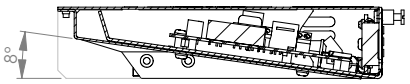
SIDE VIEW

(MOUNTING BRACKET NOT SHOWN)



TOP VIEW

(LIST 23, 25, 26 MOUNTING OPTIONS SHOWN)



SECTION A - A

ANGLED PROFILE TO DEFLECT
HEAT FROM EQUIPMENT BELOW

23" CABINET MOUNTING

DIMENSIONS ARE IN INCHES WITH METRIC [mm] IN BRACKET: INCHES [mm]

LTR	DESCRIPTION	QTY
	FINISHED HOLE LEGEND	

ARGUS TECHNOLOGIES

DESIGN	C.A.	2001/10	MATERIAL
DRAWN	J.U.	2001/10	
CHECKED			
APPROVED			FINISH

TOLERANCES
X.X ±0.04" [X] ±1mm
X.XX ±0.02" [X.X] ±0.5mm
X.XXX ±0.01" [X.XX] ±0.25mm

PER P.O. and Doc. 070-024-83

SCALE **N.T.S.**

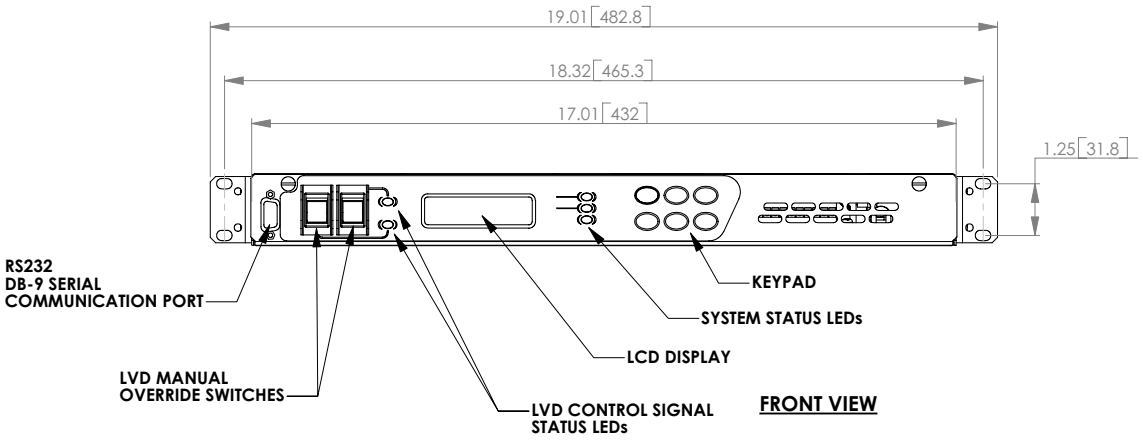
TITLE
OUTLINE, BAFFLE MOUNT
SM04

ISSUE DATE

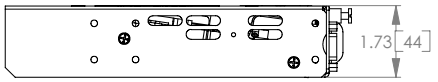
SHEET 2 OF 3

SIZE	TYPE	DWG NO.	REV
B	D2	018-543-06	A

REVISIONS			
LTR	DESCRIPTION	DATE	APPD

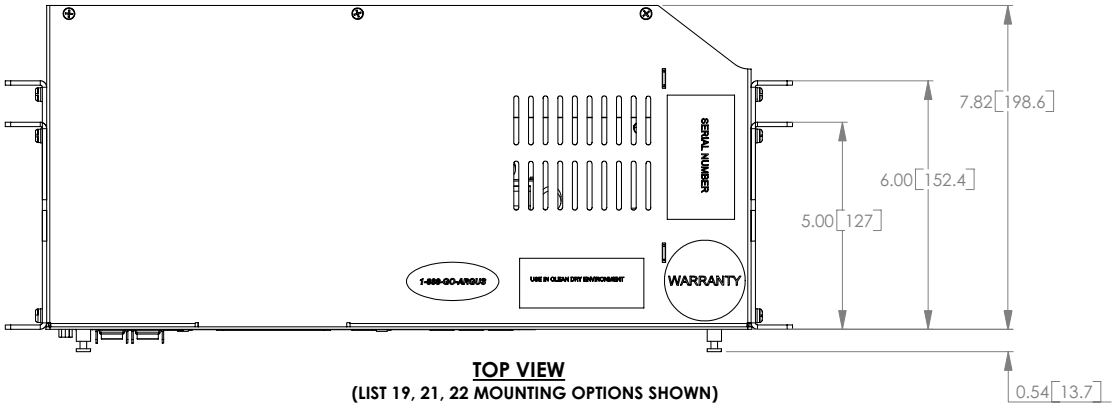


FRONT VIEW



SIDE VIEW

(MOUNTING BRACKET NOT SHOWN)



TOP VIEW

(LIST 19, 21, 22 MOUNTING OPTIONS SHOWN)

19" CABINET MOUNTING

DIMENSIONS ARE IN INCHES WITH METRIC [mm] IN BRACKET: INCHES [mm]

LTR	DESCRIPTION	QTY
	FINISHED HOLE LEGEND	

ARGUS TECHNOLOGIES

DESIGN	C.A.	2001/10	MATERIAL
DRAWN	J.U.	2001/10	
CHECKED			
APPROVED			FINISH

TOLERANCES
X.X ±0.04" [X] ±1mm
X.XX ±0.02" [X.X] ±0.5mm
X.XXX ±0.01" [X.XX] ±0.25mm

PER P.O. and Doc. 070-024-83

SCALE N.T.S.

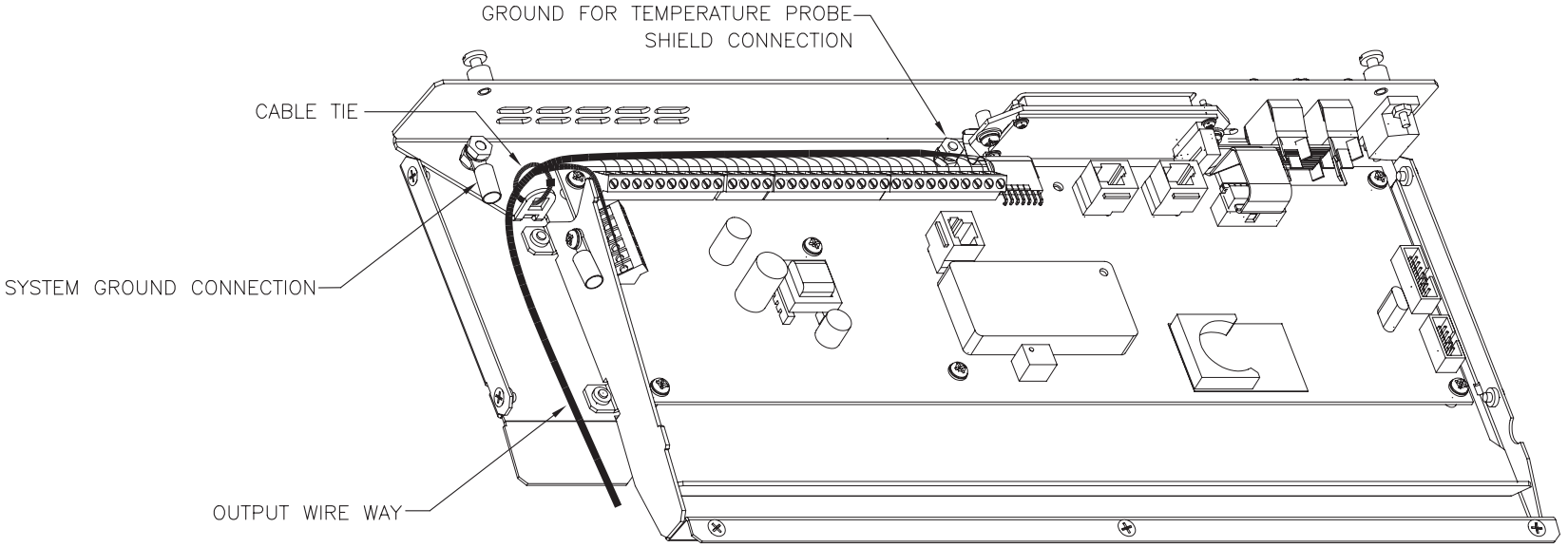
TITLE
OUTLINE, BAFFLE MOUNT
SM04

ISSUE DATE

SHEET 3 OF 3

SIZE	TYPE	DWG NO.	REV
B	D2	018-543-06	A

REVISIONS			
LTR	DESCRIPTION	DATE	APPD



TOP REAR VIEW

TOP COVER REMOVED
PCB DETAILS OMITTED

LTR	DESCRIPTION	QTY
	FINISHED HOLE LEGEND	

ARGUS TECHNOLOGIES

DESIGN	J.K.	2001/10	MATERIAL
DRAWN	J.U.	2001/10	
CHECKED			FINISH
APPROVED			
TOLERANCES (UNLESS OTHERWISE NOTED)			SCALE N.T.S.

TITLE
CUSTOMER CONNECTION
SM04 – BAFFLE MOUNT

ISSUE DATE			SHEET 1 OF 2
SIZE B	TYPE A1	DWG NO. 018-543-08	REV A

REVISIONS			
LTR	DESCRIPTION	DATE	APPD

AUX RS485 CONNECTOR PIN OUT (P11)

1. DIGITAL GROUND
2. Tx1/Rx1 (+)
3. Tx1/Rx1 (–)
4. Tx1/Rx1 (–)
5. Tx1/Rx1 (+)
6. SCI EN1

RS485 CONNECTOR PIN OUT (P13)

1. DIGITAL GROUND
2. Tx2/Rx2 (+)
3. Tx2/Rx2 (–)
4. Tx2/Rx2 (–)
5. Tx2/Rx2 (+)
6. SCI EN2

TELCO CONNECTOR PIN OUT (P10)

1. NOT CONNECTED
2. RING
3. TIP
4. NOT CONNECTED

LVD CONNECTIONS

JUMPER SETTINGS FOR JP10 – JP11

JUMPER OUT

LVD CONTROL SIGNAL STATUS LEDs DISABLED

JUMPER IN

LVD CONTROL SIGNAL STATUS LEDs ENABLED

JUMPER SETTINGS FOR JP2 – 6

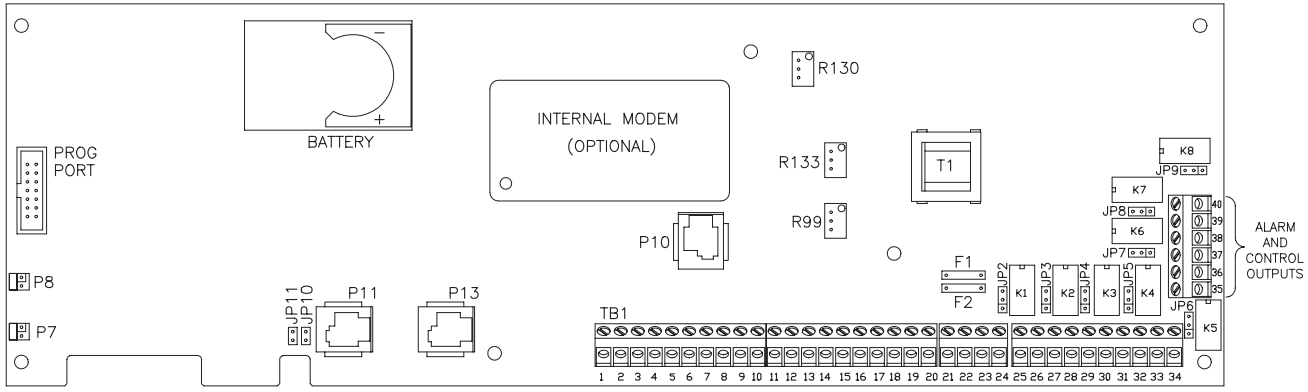
NORMALLY OPEN

NORMALLY CLOSED

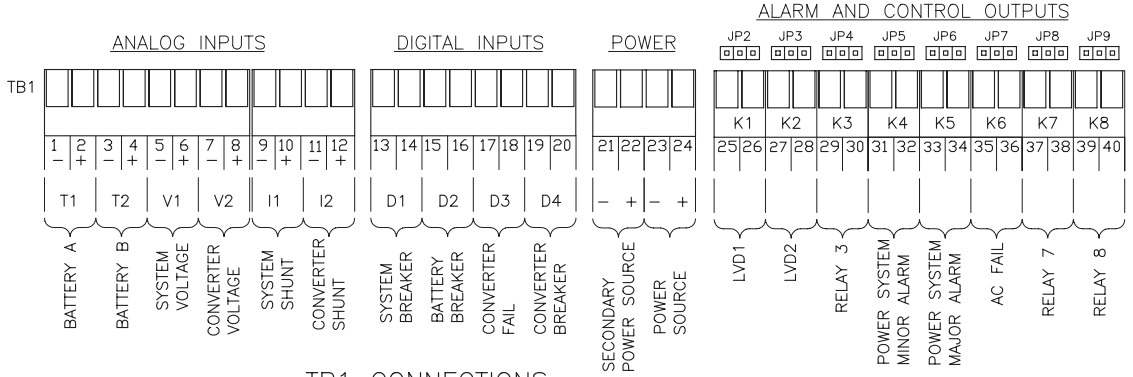
JUMPER SETTINGS FOR JP7 – 9

NORMALLY OPEN

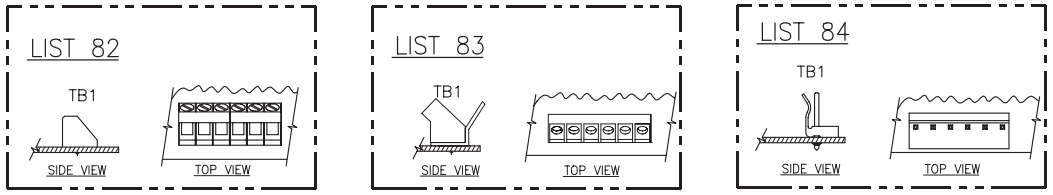
NORMALLY CLOSED



PCB TOP VIEW



TB1 CONNECTIONS



TERMINAL BLOCK OPTIONS

(SOME DETAILS OMMITED, TB1 TERMINALS DETAIL SHOWN ABOVE)

LTR	DESCRIPTION	QTY
	FINISHED HOLE LEGEND	

ARGUS TECHNOLOGIES

DESIGN	J.K.	2001/10	MATERIAL
DRAWN	J.U.	2001/10	
CHECKED			
APPROVED			FINISH
TOLERANCES (UNLESS OTHERWISE NOTED)			SCALE N.T.S.

TITLE

CUSTOMER CONNECTION
SM04 – BAFFLE MOUNT

ISSUE DATE	SHEET 2 OF 2	
SIZE B	TYPE A1	DWG NO. 018–543–08 REV A

FACTORY SERVICE INFORMATION

Technical Support

Technical support staff are available for answering general questions related to installation, operation and maintenance of Argus products. In Canada and the USA, call Argus toll free 7:30 am to 5:00 pm Pacific Standard Time at:

+1-888 GO ARGUS

(+1-888-462-7487)

For emergencies, call +1-888-GO-ARGUS 24 hours a day, seven days a week.
Customers outside Canada and the USA, call +1-604-436-5547 for technical support.

Training

Argus offers various levels of product and technical training. These workshops provide a mix of theory and hands on application for qualified customers. Please consult your sales representative for course schedules, locations and costs, or visit our website at ***www.argusdcpower.com***.

Factory Repair and Servicing

All service, beyond initial adjustments, should be carried out by qualified factory service personnel. For these procedures, please contact Argus Technologies at the locations listed to the right.

Product Returns

Before returning any product for service, please obtain a Return Material Authorization (RMA) number from an Argus factory service representative. The representative will require the model and serial number, as well as a brief description of the problem prior to issuing the RMA number. All material must be pre-authorized before being returned.
See document 048-507-10 "Warranty and Repair Information" for more details.

Moving and Storage

Units must be suitably packed in the original shipping container (or equivalent) prior to re-shipping. The box should be completely enclosed and constructed of wood or double-wall, corrugated cardboard. At least 3" of foam or shock absorbing packing material must surround the unit.

Factory Service Centers

Canada and International
Argus Technologies Ltd.
ATTN: RMA Returns
7033 Antrim Avenue
Burnaby, BC, V5J 4M5 Canada
Tel: +1 604 436 5900
Fax: +1 604 436 1233
Email: returns@argusdcpower.com

USA
Argus Technologies Inc.
ATTN: RMA Returns
3116 Mercer Avenue
Bellingham, WA, 98225 USA
Tel: +1-360 756 4904
Fax: +1-360 647 0498
Email: returns-usa@argusdcpower.com

Asia-Pacific
PCM Electronics (Dong Guan) Co., Ltd.
Hongli Industrial Area, Miaobian, Liaobu Town,
Dongguan City, Guangdong Province,
523400 China
Tel: +86 755 8895 3310
Fax: +86 755 8895 3307

Authorized Service Center

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Fax: +61 02 9822 8077

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Unit 3, 30 Heathcote Road
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New Zealand Sales & Service
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