BDS–256XL Monitor

Product Description Guide

Vertiv Corporation
1050 Dearborn Drive
Columbus, OH 43085
Tel: (954) 377-7101 Fax: (954) 377-7042
www.vertivco.com
590-2097-501A/SL-29412/4200-064

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Drawings

Important Note: The drawings in this manual may not be the most recent revision and are included for reference only. Refer to the Engineering Drawing Package included with your system for the newest drawings.

General Assembly, RTM–XLR	BDS–1277–B1202
General Assembly, CM–XL8	BDS–1278–B1203
General Assembly, DCM–XL48	BDS–1279–B1204
General Assembly, DCM–XL48d	BDS–1280–B1205

List of Figures

1. Product Description

The BDS–256XL is a stand–alone monitor for UPS applications. What sets Vertiv monitors apart from others is their ability to provide early warning of battery problems. The monitors check the state of health of each cell by performing a proactive resistance test, a reliable predictor of battery performance. In addition, to indicate immediate battery health and monitor status of a given location, the system reports to a Central computer/a generic PC displaying status screens.

Using polling and data transfer algorithms, the Battery Monitor Data Manager program lets a Central computer manage over 1000 monitor systems. Data is stored in the computer database for later analysis and reporting. At any time, service personnel may call a battery location from the Central computer or a remote location, such as from home, or directly connect to the monitor without losing contact with the computer.

The Data Manager string and monitor status indicators make central battery monitoring easy. Terms such as Discharging, Alarm or Warning for string status or Active for monitor status quickly summarize events. Conditions reported to the Central computer are displayed as a list, to easily identify trouble spots. The system also features several methods of automated reporting of alarm occurrences, such as contacting key personnel via a pager, email or fax.

Flexibility was a major design consideration. Because the monitors are stand–alone units with no external computer needed, a primary protocol using MODBUS ASCII was selected to let you incorporate the monitor into large–scale facility monitors. This allows third–party interfaces to access all the stand–alone features of the monitor, yet leaves the advanced features of the Data Manager remote communication software available for service personnel.

1.1 Measurement Capabilities

- 256 Cells/modules per string
- 8 Strings maximum
- Overall Voltage OV
- 1 Float/Discharge sensor per string
- 10 Temperature sensors/string 2 maximum per DCM
- Cell Resistance
  Intercell Resistance – DCM model dependent
  Intertier Resistance

1.2 Features

This section describes standard and optional BDS–256XL features:

Standard

- Auto detects discharges based on Overall Volts OV or Discharge Current DC, and stores data for real time or accelerated time playback,
- Communicates with an external computer via USB, RS–232, modem, and LAN,
- Is SQL server compatible,
- Performs a scheduled resistance test of all cells/jars, intercells and intertiers, and stores results for trending analysis, and
- Scans all pertinent battery parameters, such as overall voltage, cell voltages, intertier or intercell voltages – DCM dependent.

Optional Features

- Hall effect current transducer for measuring discharge and float current
- Is network compatible with a network card
- Monitors up to 16 digital inputs, 8 control outputs with a digital I/O card
- Performs Continuous Load Unit CLU control
- Temperature sensor: Electrolyte Probe or Contact Ambient Probes

Alarm Features

- 8 control outputs, trigger able on any alarm event
- The monitor may be set to signal if any parameter is outside user–programmed limits, energizes a Form C relay contact, and calls a Central computer to report the alarm condition.
- The monitor may be set to automatically call the Central computer to report an alarm condition when detected.
- High and low alarm levels may be programmed on all voltage and temperature parameters, and a high alarm level for resistance.
- When any parameter goes outside the normal range, the monitor stores the event in memory, the Alarm LED lights, and an alarm relay with a Form C contact energizes.
- The alarms may be set for latching or nonlatching.

1.3 Model Numbers

The BDS–256XL system consists of:

1. CM–XL8 Controller Module
2. DCM–XL48 Combined Reading or DCM–XL48d Discrete Reading Data Collection Modules DCMs
3. RTM–XLR Resistance Test Modules RTMs

Additional components may include a Personal Computer PC, a cabinet to house the PC and Controller, a LAN adaptor, DCM tower enclosures, and a supplementary external power supply.

CM–XL8 Controller Model Number Description

The CM–XL8 Controller model numbers are structured as 1002–nnn xxx, described below.

CM–XL8 Controller Model Number Description	
1002–210	4 Amp output for DCM and RTM power
1002–211	10 Amp output for DCM and RTM power
1002–212	20 Amp output for DCM and RTM power
1002–210–230	4 Amp output for DCM and RTM power
1002–211–230	10 Amp output for DCM and RTM power
1002–212–230	20 Amp output for DCM and RTM power
1002–nnnAxx	A = a modem card is installed
1002–nnnBxx	B = a LAN card is installed
1002–nnnCxx	C = Both a modem and LAN are installed
1002–nnnDxx	D = No modem or LAN is installed
1002–nnnxDx	D = a digital I/O card is installed
1002–nnnx x	Blank = no I/O card
1002–nnnxxL	L = an MLC option is installed
1002–nnnxx	Blank = no MLC option

Figure 1. CM–XL8 Controller Model Number Description

Note: Assume 450mA per DCM and 1A per RTM–XLR. A typical CM–XL8 Controller part number might be 1002–210CDL

DCM–XL48d Model Number Description

1003–100	DCM–XL48 is Combined Reading
1003–101	DCM–XL48d is Discrete Reading
1003–102	DCM–XL48d is Discrete Reading DCM (field replacement for older units)
1003–103	DCM–XL48d is Combined Reading DCM (field replacement for older units)
1003–106	DCM–XL48 is Combined Reading (intertier greater than five count)

BSD-256XL External Power Supplies Model Number Description

1002–276	10 Amp output power supply
1002–277	20 Amp output power supply
1002–276 230	10 Amp output power supply
1002–277-230	20 Amp output power supply

RTM–XLR Model Number Description

Model Number	Where Used	Model Number	Where Used
1002–244	48V/68V	1002–288	36V/32V
1002–245	48V/80V	1002–289	48V/32V
1002–246	44V	1002–290	48V/16V
1002–247	21V	1002–291	36V/42V
1002–248	48V/40V	1002–292	44V/40V
1002–250	36V	1002–293	48V/8V
1002–251	36V/48V	1002–294	36V/24V
1002–253	36V/72V	1002–295	12V
1002–256	48V	1002–296	24V/32V
1002–257	48V/56V	1002–297	48V/52V
1002–258	48V/54V	1002–298A	24V/16V
1002–259	46V/38V	1002–299	44V/36V
1002–260	44V/42V	1002–301	48V/64V
1002–261	48V/40V	1002–302	10V
1002–263	46V/50V	1002–303	60V/48V
1002–264	48V/36V	1002–304	36V/48V
1002–265	48V/50V	1002–305	36V/30V
1002–278	48V/72V	1002–306	20V
1002–279	48V/60V	1002–307	16V
1002–280	24V/28V	1002-308	23V/22V
1002–281	24V	1002-309	20V/16V
1002–282	60V/36V	1002-310	4V
1002–283	40V		
1002–283	40V		
1002–284	48V/24V		
1002–285	32V		
1002–286	12V/8V		

Figure 2. RTM–XLR Model Number Description Table

1.4 BDS–256XL Configurations

This section is an overview of the BDS–256XL monitor configurations. The BDS–256XL can accommodate virtually any battery configuration. The following list describes the more commonly used BDS–256 XL configurations.

Configuration	*Description*
BDS–256–1 x 98 x 1	1 string of 98–1v cells in series
BDS–256–1 x 104 x 1	1 string of 104–1v cells in series
BDS–256–1 x 58 x 2	1 string of 58–2v cells in series
BDS–256–1 x 108 x 2	1 string of 108–2v cells in series
BDS–256–1 x 122 x 2	1 string of 122–2v cells in series
BDS–256–1 x 180 x 2	1 string of 180–2v cells in series
BDS–256–1 x 182 x 2	1 string of 182–2v cells in series
BDS–256–1 x 184 x 2	1 string of 184–2v cells in series
BDS–256–1 x 188 x 2	1 string of 188–2v cells in series
BDS–256–1 x 192 x 2	1 string of 192–2v cells in series
BDS–256–1 x 198 x 2	1 string of 198–2v cells in series
BDS–256–1 x 210 x 2	1 string of 210–2v cells in series
BDS–256–1 x 216 x 2	1 string of 216–2v cells in series
BDS–256–1 x 220 x 2	1 string of 220–2v cells in series
BDS–256–1 x 232 x 2	1 string of 232–2v cells in series
BDS–256–1 x 234 x 2	1 string of 234–2v cells in series
BDS–256–1 x 236 x 2	1 string of 236–2v cells in series
BDS–256–1 x 238 x 2	1 string of 238–2v cells in series
BDS–256–1 x 239 x 2	1 string of 239–2v cells in series
BDS–256–1 x 240 x 2	1 string of 240–2v cells in series
BDS–256–1 x 241 x 2	1 string of 241–2v cells in series
BDS–256–1 x 244 x 2	1 string of 244–2v cells in series
BDS–256–1 x 246 x 2	1 string of 246–2v cells in series
BDS–256–1 x 252 x 2	1 string of 252–2v cells in series
BDS–256–1 x 89 x 4	1 string of 89–4v modules in series
BDS–256–1 x 90 x 4	1 string of 90–4v modules in series
BDS–256–1 x 120 x 4	1 string of 120–4v modules in series
BDS–256–1 x 121 x 4	1 string of 121–4v modules in series
BDS–256–1 x 122 x 4	1 string of 122–4v modules in series
BDS–256–1 x 123 x 4	1 string of 123–4v modules in series
BDS–256–1 x 60 x 6	1 string of 60–6v modules in series
BDS–256–1 x 64 x 6	1 string of 64–6v modules in series
BDS–256–1 x 78 x 6	1 string of 78–6v modules in series
BDS–256–1 x 80 x 6	1 string of 80–6v modules in series
BDS–256–1 x 81 x 6	1 string of 81–6v modules in series
BDS–256–1 x 60 x 8	1 string of 60–8v modules in series
BDS–256–1 x 61 x 8	1 string of 61–8v modules in series
BDS–256–1 x 16 x 12	1 string of 16–12v modules in series
BDS–256–1 x 27 x 12	1 string of 27–12v modules in series
BDS–256–1 x 30 x 12	1 string of 30–12v modules in series

Configuration	Description
BDS–256–1 x 31 x 12	1 string of 31–12v modules in series
BDS–256–1 x 32 x 12	1 string of 32–12v modules in series
BDS–256–1 x 33 x 12	1 string of 33–12v modules in series
BDS–256–1 x 34 x 12	1 string of 34–12v modules in series
BDS–256–1 x 36 x 12	1 string of 36–12v modules in series
BDS–256–1 x 40 x 12	1 string of 40–12v modules in series
BDS–256–1 x 42 x 12	1 string of 42–12v modules in series
BDS–256–1 x 18 x 16	1 string of 18–16v modules in series
BDS–256–1 x 20 x 16	1 string of 20–16v modules in series
BDS–256–1 x 21 x 16	1 string of 21–16v modules in series
BDS–256–1 x 24 x 16	1 string of 24–16v modules in series
BDS–256–1 x 27 x 16	1 string of 27–16v modules in series
BDS–256–1 x 30 x 16	1 string of 30–16v modules in series

Figure 3. Configuration Options

1.5 Normal Operating Mode

In normal mode, the system scans all parameters in one to five seconds, depending on the configuration. As readings are taken, they are compared to user–programmed alarm levels. The monitor can then call a Central computer and energize an alarm contact if a parameter exceeds a level. Front panel LEDs indicate scan and alarm status, and alarm events are stored in memory for future analysis. The BDS can be programmed for critical and maintenance alarms.

1.6 Discharge Mode

If a discharge is detected, the system goes into a data logging mode and stores battery voltages and discharge current into a discharge record.

1.7 Resistance Test Mode

A battery resistance test may be performed at user–set intervals. The test is similar to that performed by the Vertiv Cellcorder. On a BDS–256XL, up to fifteen intertiers can be configured for this measurement. Certain models are capable of separate intercell connection measurements.

1.8 Battery Monitor Data Manager BMDM Program Features

- Automatic paging, emailing, and faxing of alarm events.
- Automatic polling for over 1000 monitor sites for monitor and string status reporting.
- Automatically receives calls from monitors and updates the central database for data analysis.
- Complete memo tracking down to the cell/module level.
- Easy to read string and monitor status.
- Historical event list for complete string history.
- Instant trend graphs of any selected parameter.
- Microsoft Access™ database compatible, with management of all stored data. Optional SQL.
- Network compatible.
- Playback of discharge rundown test and controlled rundown test data.
- Service mode for service personnel, and local USB direct connect viewing of string details and system setup when loaded on a laptop computer.
- Status display can be customized for multi–customer monitoring.
- Windows™ 2000, XP, 7 and 8 compatible Central computer control software.

1.9 Optional Accessories

- Continuous Load Unit CLU control
- Digital I/O card for monitoring 16 digital inputs or controlling eight control outputs
- Hall effect Current Transducer CT for measuring discharge and float current
- Network interface, modem
- Temperature sensor: Electrolyte Probe or Contact Ambient Probe

2. Panel Controls and Indicators

This section describes the front and rear panels of the discreet components that comprise a typical BDS–256 XL system. Additional descriptions may appear elsewhere in this manual or in related manuals.

Panel indicator colors are:

- Red (R)
- Yellow (Y)
- Green (G)

2.1 BDS–256 XL System

The BDS–256XL system consists of:

1. CM–XL8 Controller Module
2. DCM–XL48 Combined Reading or DCM–XL48d Discrete Reading Data Collection Modules DCMs
3. RTM–XLR Resistance Test Modules RTMs

Additional components may include a Personal Computer PC, a cabinet to house the PC and Controller, a LAN adaptor, DCM tower enclosures, and a supplementary power module.

2.2 CM–XL8

Front Panel Connectors

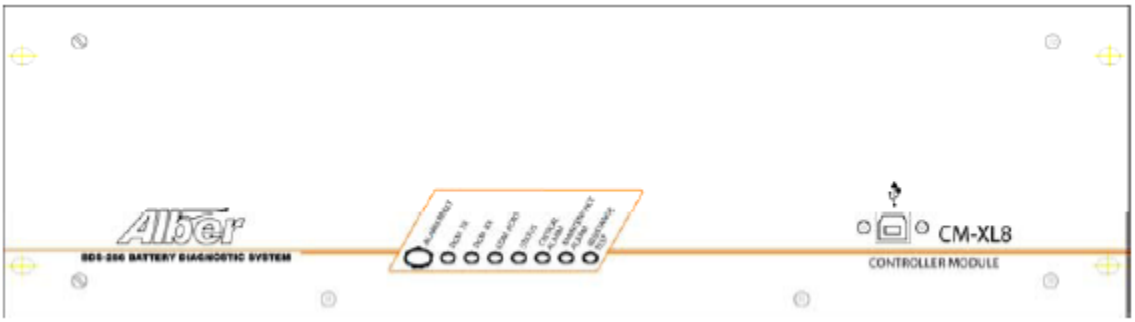

Figure 4. Controller Front Panel With USB

LOCAL PORT		USB port. Connects to a laptop computer

Front Panel Controls/Alarm Reset Switch

ALARM RESET Switch	During normal operation, clears latched alarms. If held during power up, clears existing names in the BDS, disables alarms, disables dial out, and resets the password to alber.

Front Panel Indicators/DCM TX /RX/COM/Status/Alarms And Test

Figure 5. CM–XL8 Front Panel Indicators LEDs Explained

DCM TX GREEN (G)	Flashes during fiber optic transmit
DCM RX GREEN (G)	Flashes during fiber optic receive
COM PORT GREEN (G)	Flashes to indicate communication via LAN port or an incoming call
STATUS GREEN (G)	Flashes during normal operating conditions
CRITICAL ALARM RED (R)	Critical alarm detected
MAINTENANCE ALARM YELLOW (Y)	Maintenance alarm detected
RESISTANCE TEST GREEN (G)	Performing a manual or automatic resistance test

Rear Panel Connectors

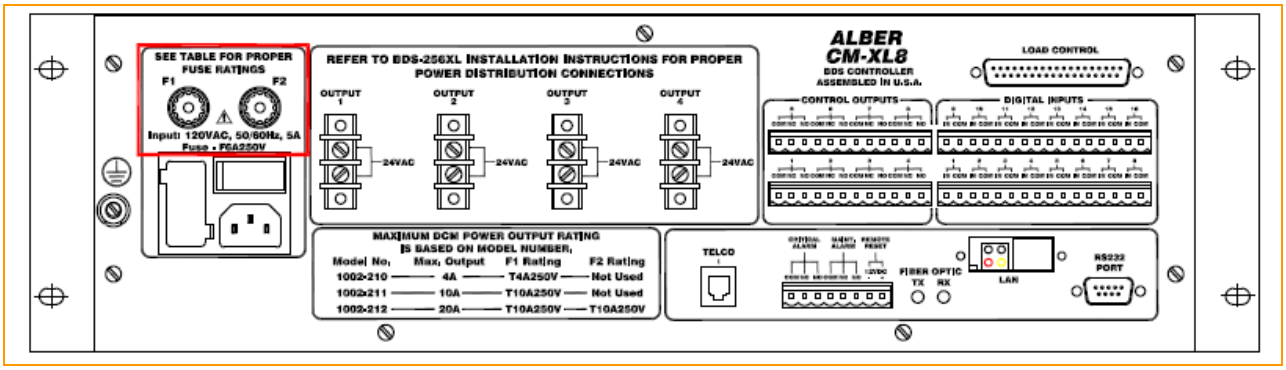

Figure 6. User Replaceable Fuses 1 And 2

Fuses

T10A250V 2 user replaceable fuses. Values based on CM–XL8 model number. See table below.

F1 and F2 Fuse Ratings Table*			
Model Number	Max Output	Fuse F1 Rating	Fuse F2 Rating
1002–210	4A	T4A250V	Not Used
1002–211	10A	T10A250V	Not Used
1002–212	20A	T10A250V	T10A250V

Figure 7. F1 And F2 Fuse Ratings Table*

WARNING: This table is provided as a reference only and may not agree with the actual capacity of your system. You must refer to the table on the rear panel of your CM–XL8 to determine the actual fuse values required by your system and the system output capabilities.

Input/AC Power Block

- 115VAC 50/60Hz or 230VAC 50/60Hz (Optional)
- User replaceable fuse and receptacle for AC power cord
- Power switch for system on/off

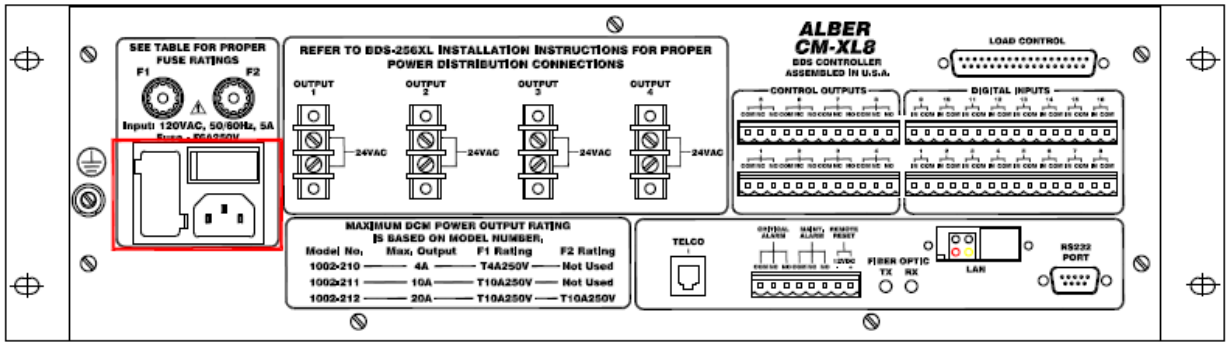

Figure 8. CM–XL8 Input/AC Power Block

Output/Load Control/Control Outputs/Digital Inputs

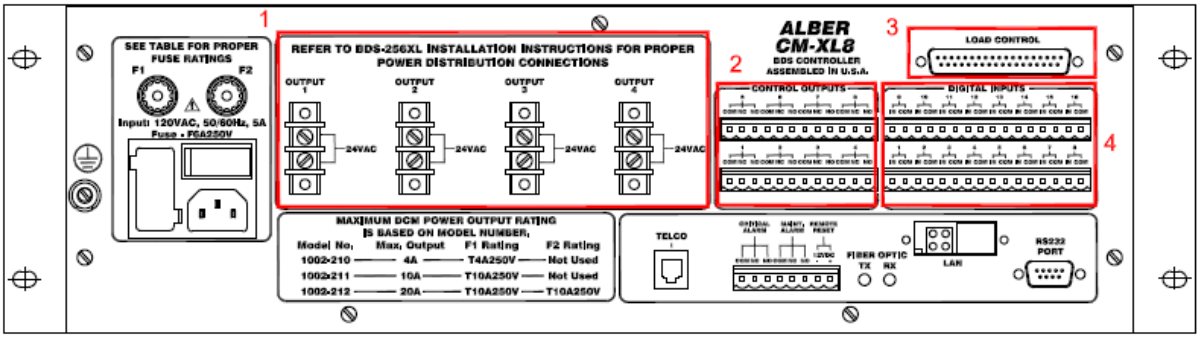

Figure 9. CM–XL8 Output/Load Control/Control Outputs/Digital Inputs

1.	4 Pairs of screw terminals	Provide 24VAC.
2.	Control Outputs 1 to 8	Form C contacts for controlling external devices.
3.	Load Control	Connects to an Albér CLU Series load bank (not a Resistance Test Module).
4.	Digital Inputs 1 to 16	Optically isolated inputs for sensing contact closures.

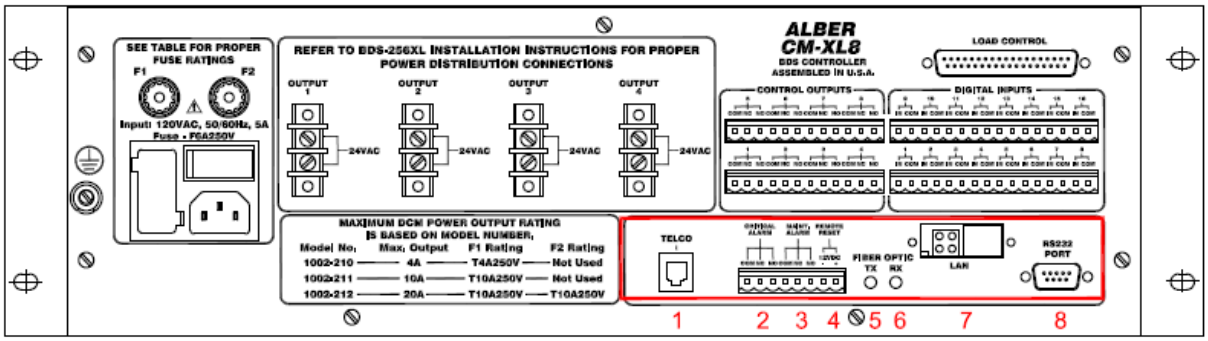

Figure 10. CM–XL8 TELCO, Alarms, Reset, Fiber Optic, LAN, RS232

1. Telco	RJ–11 jack; Communicates with a remote computer via telephone
2. Critical Alarm	Form C alarm contacts, software configurable
3. Maint. Alarm	Form C alarm contacts, software configurable
4. Remote Alarm	Reads momentary contact closure Requires a user–supplied 12V to 32V signal
5. Fiber Optic TX 6. Fiber Optic RX	Fiber Optic transmit/receive ports for DCM communication
7. LAN	RJ–45 port; Communicates with a remote computer via network
8. RS 232 Port	RS–232 port; Connects to a computer (Local port USB is on front panel.)

2.3 DCM–XL48d

Front Panel Indicators

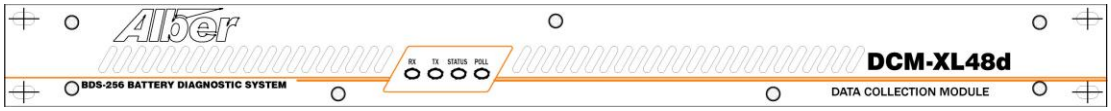

Figure 11. DCM–XL48d Front Panel

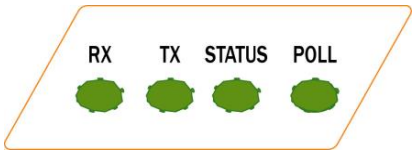

Figure 12. DCM–XL48d Front Panel Indicators Explained

RX GREEN (G)	Flashes during fiber optic receive
TX GREEN (G)	Flashes during fiber optic transmit
STATUS GREEN (G)	Flashes during normal operating conditions

POLL GREEN (G)	Flashes during polling from Controller

Rear Panel Connectors

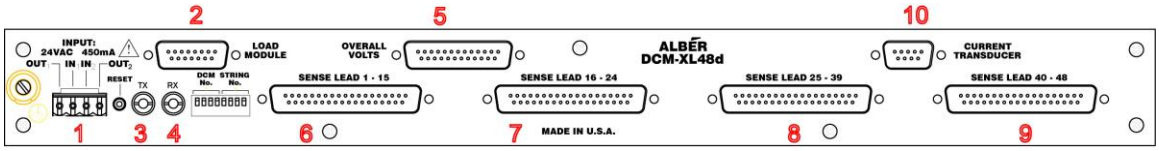

Figure 13. DCM–XL48d Rear Panel Connectors Explained

1. 24VAC 450MA Power Input / Output	A 4–pin connector for daisy–chaining 24VAC to other DCMs.
2. Load Module	Control port for Resistance Test Module communication.
3. TX 4. RX	Fiber Optic transmit / receive ports for communicating with a Controller or other DCMs.
5. Overall Volts	DB–25 port. Connection for strings Overall Voltage.
6. Sense Lead 1 to 15, 7. Sense Lead 16 to 24/ **Temperature 1 and Intertiers 1–5 on DCM Model 1003–103 8. Sense Lead 25 to 39 9. Sense Lead 40 to 48/ **Temperature 2 and Intertiers 6–10 on DCM Model 1003–103	DB–25 ports. Connects voltage sense leads to the batteries. **For sense and power connections for temperature sensors.
10. Current Transducers/Float and Discharge	9 pin. For sense and power connections for float current and discharge current transducers.

Rear Panel Controls

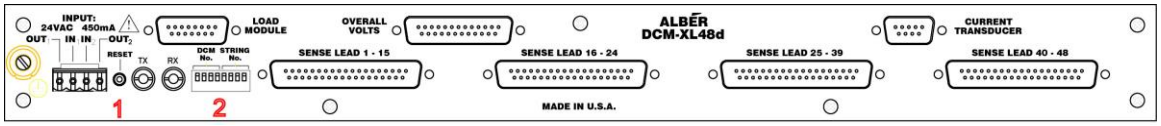

Figure 14. CDM–XL48d Rear Panel Controls

1. Reset	Push button to reset the DCM.
2. DCM NO. and String NO.	DIP switches. Sets DCM/string identification.

2.4 DCM–XL48

Front Panel Indicators

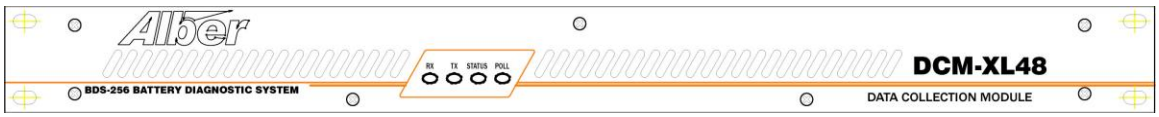

Figure 15. DCM–XL48 Front Panel

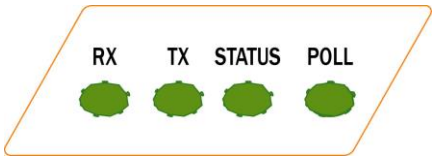

Figure 16. DCM–XL48 Front Panel Indicators Explained

RX GREEN (G)	Flashes during fiber optic receive.
TX GREEN (G)	Flashes during fiber optic transmit.
STATUS GREEN (G)	Flashes during normal operating conditions.
POLL GREEN (G)	Flashes during polling from Controller.

Rear Panel Connectors

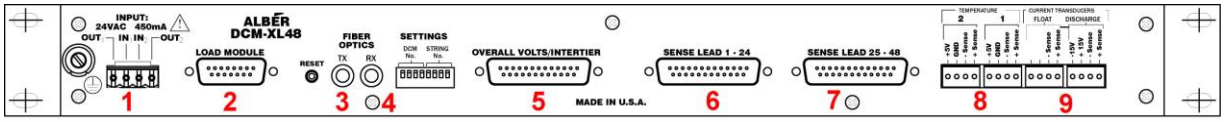

Figure 17. DCM–XL48 Rear Panel Connectors Explained

1. 24VAC 450MA Power Input / Output	A 4–pin connector for daisy–chaining 24VAC to other DCMs.
2. Load Module	Control port for Resistance Test Module communication.
3. TX 4. RX	Fiber Optic transmit / receive ports for communicating with a Controller or other DCMs.
5. Overall Volts/Intertier	DB–25 port. Connects Overall Voltage and Discharge sense leads when connecting a shunt.
6. Sense Lead 1 to 24 7. Sense Lead 25 to 48	DB–25 ports. Connects voltage sense leads to the batteries.
8. Temperature 1 and 2	4 pin. For sense and power connections for temperature sensors.
9. Current Transducers/Float and Discharge	4 pin. For sense and power connections for float current and discharge current transducers.

Rear Panel Controls

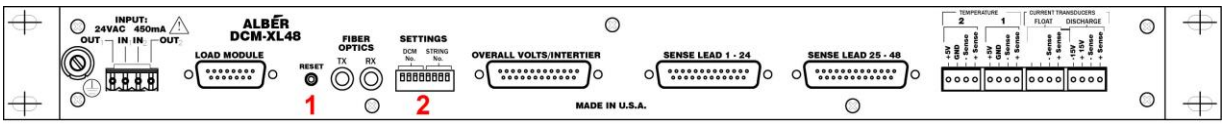

Figure 18. DCM–XL48 Rear Panel Controls

1. Reset	Push button to reset the DCM.
2. DCM NO. and String NO.	DIP switches. Sets DCM/string identification.

2.5 RTM–XLR

Front Panel Indicators

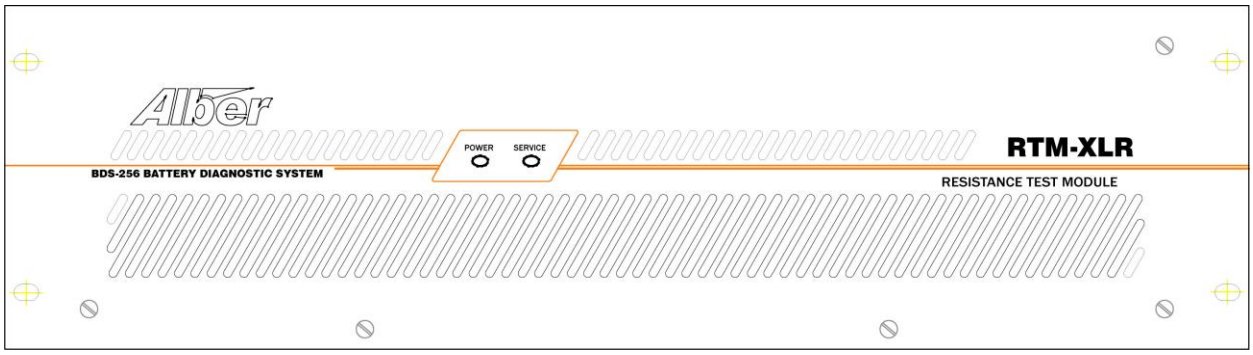

Figure 19. RTM–XLR

Figure 20. RTM–XLR LEDs

1. Power **GREEN (G)**	24VAC power is applied
2. Service **RED (R)**	Unit requires factory service, usually because internal temperature exceeded specifications

Rear Panel Connectors

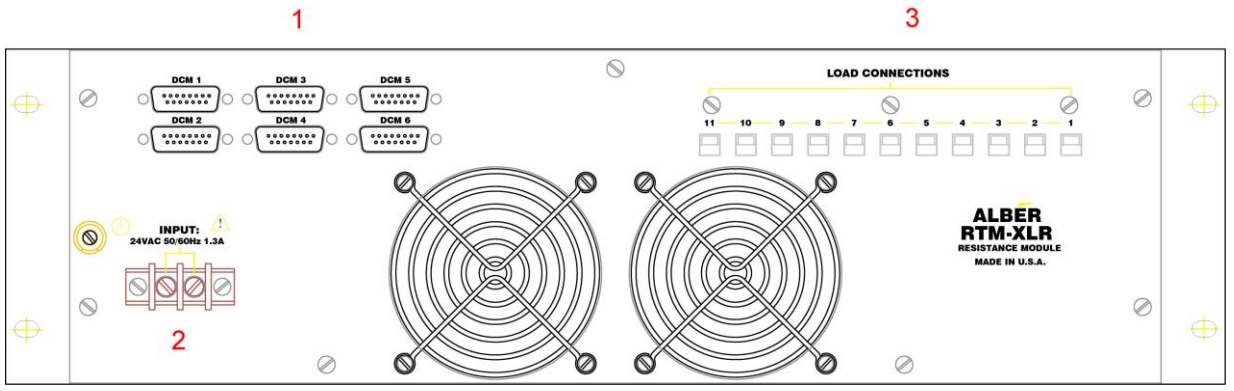

Figure 21. RTM–XLR Rear Panel Connectors

1. DCM 1 to 6	Ports for DCM communication
2. Input 24VAC 50/60HZ AC Power	Power input
3. Load Connections 1 to 11	Provide load to the batteries when activated

2.6 BDS-256XL External Power Supply

Front Panel Indicators

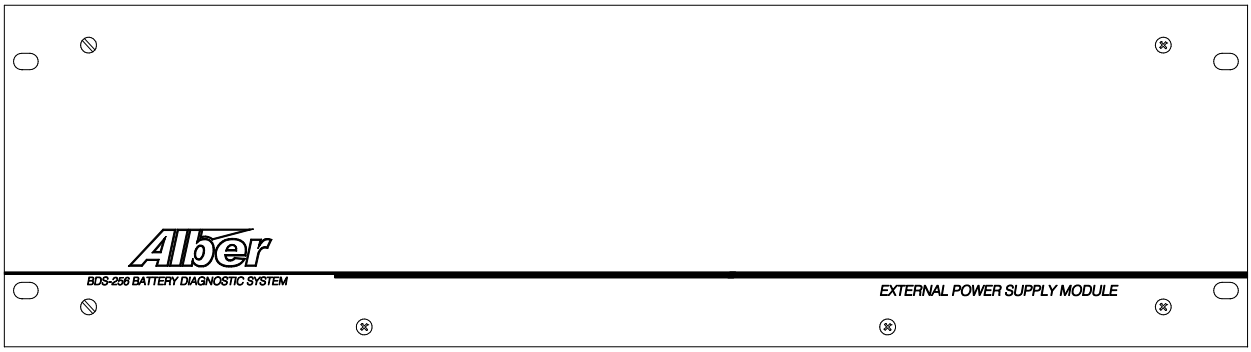

Figure 22. BDS-256XL External Power Supply Module Front Panel

Rear Panel Connectors

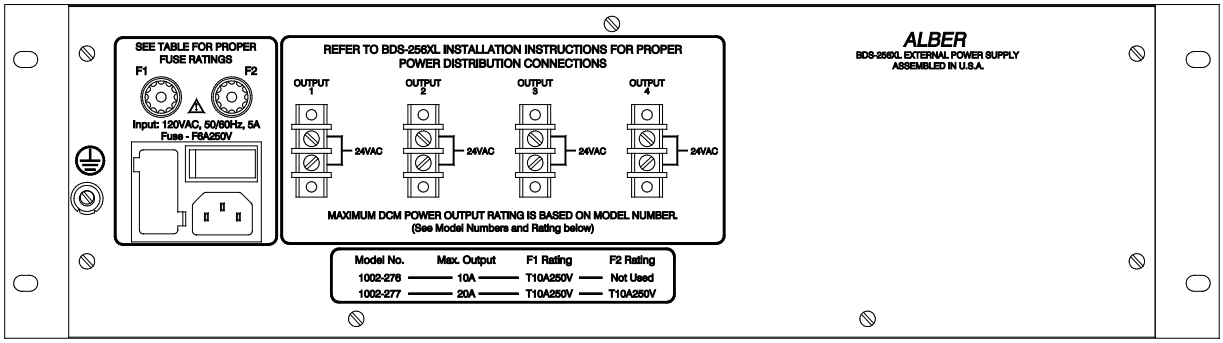

Figure 23. BDS-256XL External Power Supply Module Rear Panel Connectors

1. Input 24VAC 50/60HZ AC Power	Power input
2. Output power connections terminal strips	Power source for DCMs and RCMs

Fuses

T10A250V 2 user replaceable fuses. Values based on model number. See table below.

F1 and F2 Fuse Ratings Table*			
Model Number	Max Output	Fuse F1 Rating	Fuse F2 Rating
1002–276	10A	T10A250V	Not Used
1002–277	20A	T10A250V	T10A250V

3. Specifications

3.1 BDS-256 XL Specifications

Inputs

- Cell voltage: 1V (NICAD), 2V, 4V, 6V, 8V, 12V and 16V ranges
- 10 intertier resistance channels per DCM. (Models 1003-101, 1003-102, 1003-103, and 1003-106 only)
  Optional 6 DCMs total, with 15 intertiers per string
- String voltage
- 10 (maximum) temperature channels per string.* 2 per DCM
- Discharge Current*
- Float Current*
- 16 digital inputs (Optional)

*Optional temperature and current transducers are required.
*Optional temperature transducer can be contact type or immersible.

Outputs
Eight control outputs from the Controller (Optional).

Parameters / Features

Number of cell channels:	Up to 8 strings of 256 cells per string Up to 6 DCM units per string

Measurement Range / Tolerances

Intertier resistance:	0 to 5mΩ, 5% of reading ±5μΩ		
Cell voltage:	1V range	0–2V	0.1% ±1mV
	2V range	0–4V	0.1% ±1mV
	4V range	0–8V	0.1% ±2mV
	6V range	0–8.5V	0.1% ±2mV
	8V range	0–10V	0.1% ±10mV
	12V range	0–16V	0.1% ±10mV
	16V range	0-20V	0.1% ±20mV
Cell resistance:	0 to 32,000μΩ, 5% of reading ±1μΩ		
Intercell Resistance:	0 to 500μΩ, 0.25% of reading ±5μΩ Optional harness required		
String Voltage:	0 to 80.00 volts, 0.2% of reading ±0.02 volts 0 to 400.0 volts, 0.2% of reading ±0.1 volts 0 to 600.0 volts, 0.2% of reading ±0.2 volts		
*Discharge Current:	0 to 4000A ±5% of full scale		
*Float Current:	0 to 5000mA ±50mA		
*Temperature:	0°C to 80°C (32°F to 176°F), ±1°C.		
*	Optional Current Transducer CT required Transducer accuracy affects overall current/temperature reading accuracy.		

Operating Environment

Temperature range: 5°C to 40°C (41°F to 104°F)
Humidity range: 0% to 80% RH (non condensing) at 5°C to 31°C
0% to 50% RH (non condensing) at 32°C to 40°C
Indoor use only
Installation category II
Pollution degree 2
Altitude 0 to 2000 meters above sea level

WARNING: A BDS–256 XL system, comprising a CM–XL8 Controller, DCM–XL48d or XL48, RTM–XLR Resistance Test Modules and External Power Supply module, may be mounted in a 19" wide rack enclosure. If using such rack enclosure, be certain it is properly earth grounded and adequate ventilation is provided to prevent equipment overheating. Refer to the respective installation manual for more information. The receptacle for the AC cord from the cabinet must have protective earth connection, three prong plug. Never defeat the use of the earth connection prong.

BDS–256 XL Cabinet Specifications

A BDS–256 XL system consists of:

- one CM–XL8 Controller Module
- one or more DCM Data Collection Modules
- RTM–XLR Resistance Test Modules.
- External Power Supply (configuration dependent)

Power

- 115VAC ±10% 60Hz 5 amps maximum

Model

Part number 1100–262, where the computer, monitor, UPS, Controller, DCM, and Resistance Test Module may be mounted within as required.

Maximum Dimensions

24" wide x 26" high x 37" deep with folding keyboard tray down

Installation Requirements

- Only equipment that is part of the BDS system should be installed in the BDS cabinet.
- The 4 corners of the cabinet must be securely bolted to the floor.

Operating Environment

- Temperature range: 5°C to 40°C (41°F to 104°F)
- Humidity range: 0% to 80% RH (non condensing) at 5°C to 31°C
  0% to 50% RH (non condensing) at 32°C to 40°C
- Indoor use only
- Installation category II
- Pollution degree 2
- Altitude 0 to 2000 meters above sea level

3.2 CM–XL8 Controller Specifications

Power

- 115VAC/230VAC ±10% 60Hz, 5 amps maximum for a configuration of 8 strings of 240 cells

Fuses

- One 500mA Slo-Blo and one 2A Slo-Blo On PC board Not user replaceable
- Fuse #1 and #2 on the rear panel (For values, refer to the model number description):
  - one 6A fast acting (4301-006) or 3A Slo-Blo (4301-007) for 115VAC or 2.5A for 230VAC, ABC or equivalent
  - AC power block–rear panel

Inputs

- Remote alarm reset User–supplied 12V signal, 15mA maximum **Note**: Momentarily applying voltage initiates the reset action

- Digital input (Optional). Sixteen 12V, 15mA maximum **Note**: For monitoring external dry contacts

Outputs

- 24VAC power for up to 8 strings of DCMs and Resistance Test Modules (configuration dependent).
- Alarm contacts: 2 Form C, 2A at 30VDC. One for critical alarm, and one for maintenance alarm.
- User programmable relay contacts (Optional). 8 Form C, 2A at 30VDC
- LEDs (one each):
  GREEN (G) DCM TX transmit
  GREEN (G) DCM Rx receive
  GREEN (G) com port
  GREEN (G) status
  RED (R) critical alarm
  YELLOW (Y) maintenance alarm
  GREEN (G) resistance test

Communication

- MODBUS protocol, ASCII, and SNMP to PC, Vertiv proprietary to DCMs.
- Local port, USB connector–front panel
- Local port, RS–232 DB–9 connector –rear panel
- LAN port, RJ–45–Optional–rear panel
- RJ–11 TELCO line, internal 14.4Kbs modem–rear panel
- Fiber optic ports–DCM communication link

Data Storage

- SRAM 8 MB nonvolatile memory for all configuration settings and data
- Flash memory for firmware upgrades

Control Switches

- Power on/off: Main DCM power switch on rear panel of CM–XL8 Controller module. Rocker switch.
- Alarm Reset: On front panel of CM–XL8 Controller module. Momentary push button.

Tolerances

Tolerances are described in section 3.1.4 Measurement Range / Tolerances on page 18.

Packaging

19" rack mount

Dimensions

- 19"W x 8"D x 5"H
- 16 lbs.

Agencies

- UL listed. File number E212234
- CE approved

3.3 DCM Specifications

Power

- 24VAC ±10%, 450mA maximum

Fuses

- One 2A Slo-Blo and one 0.75A Slo-Blo On PC board. **Note**: Not user replaceable

Inputs Rear Panel

- 48 cell/intercell voltage channels
- 2 temperature channels that are part of voltage channel connections
  Optional temperature transducer required
- One discharge current/Float current channel
  Optional current transducer required
- One overall voltage channel (Optional)

Outputs Front Panel

- LEDs (one each):
  GREEN (G) DCM Rx receive
  GREEN (G) DCM TX transmit
  GREEN (G) status
  GREEN (G) poll

Outputs Rear Panel

- +15VDC, –15VDC power output (Optional) for discharge current transducer
- Resistance Test Module control cable output

Combined Input / Output Connectors Rear Panel

- 24VAC
- 2 fiber optic ports

Communications

- Fiber optic Vertiv proprietary

Data Storage

- E^2 nonvolatile memory for setup
- Flash memory for firmware upgrade

Control Switches Rear Panel

- Reset switch
- DCM addressing: PC board mounted DIP switches in DCM

Tolerances

Tolerances are described in section 3.1.4 Measurement Range / Tolerances on page 18.

Packaging

19" rack mount

Dimensions

- 19"W x 10"D x 1.75"H
- 6 lbs.

Agencies

- UL listed. File number E212234
- CE approved

3.4 RTM–XLR Resistance Test Module Specifications

Power

- 24VAC ±10%, 1A maximum

Fuses

- 2 0.5A Slo-Blo. On PC board. **Note**: Not user replaceable

Inputs (rear panel)

- One 24VAC
- 6 load control cable connectors for DCM 1 to DCM 6
- 11 load connections

Outputs (front panel)

- LEDs (one each):
  GREEN (G) power and
  RED (R) service

Tolerances

Tolerances are described in section 3.1.4 Measurement Range / Tolerances on page 18.

Packaging

19" rack mount

Dimensions

- 19"W x 12"D x 5"H
- 16 lbs.

Agencies

- UL listed. File number E212234
- CE approved

4. BDS-256XL Drawings

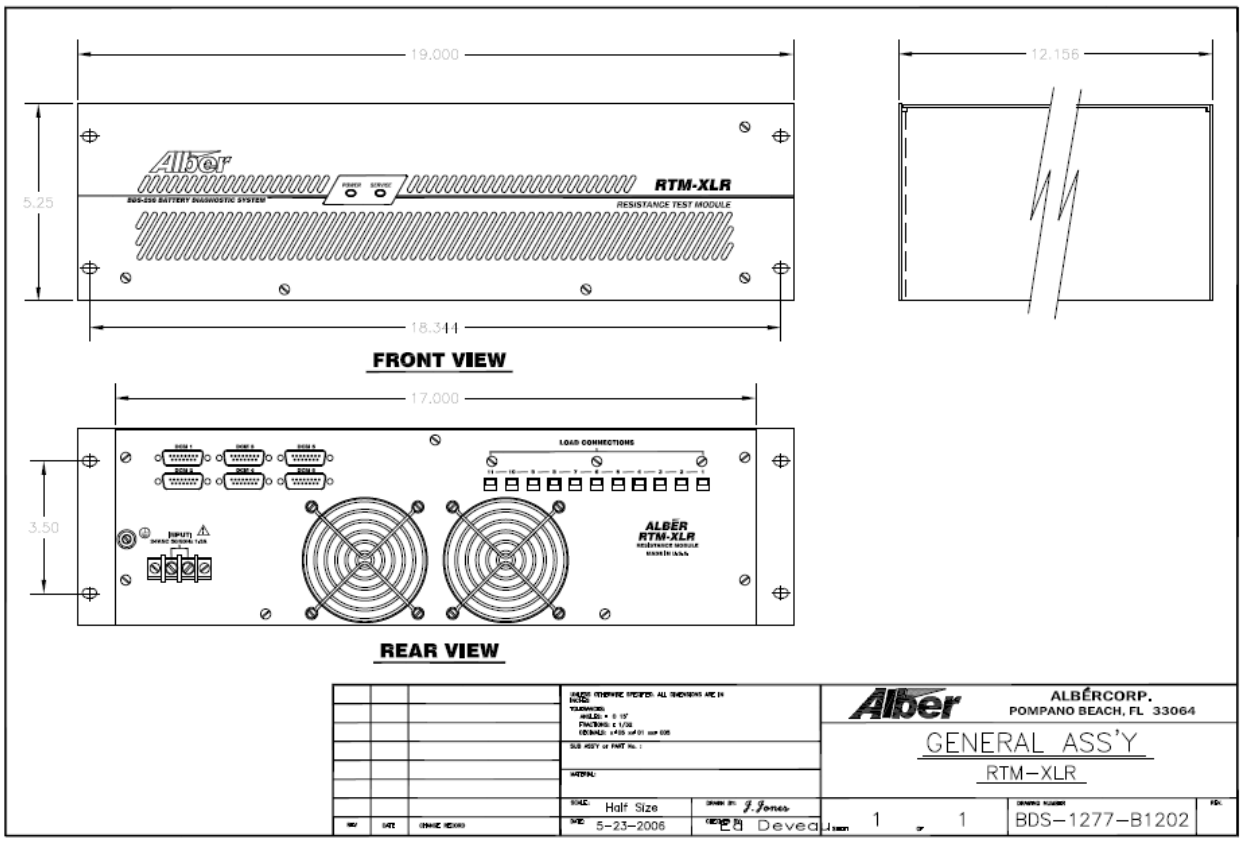

Figure 24. BDS-256XL Front and Rear View General Assembly RTM-XLR Drawing

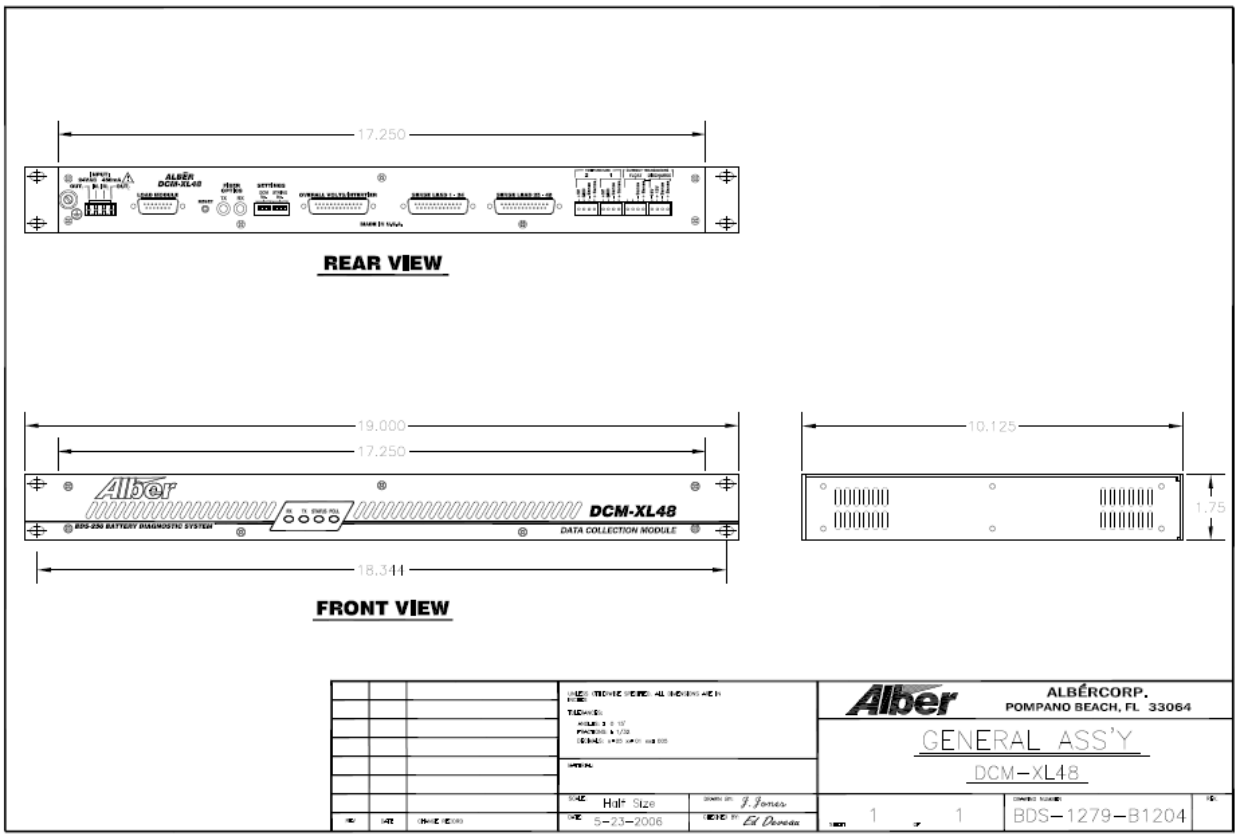

Figure 25. BDS-256XL Front and Rear View General Assembly DCM-XL48 Drawing

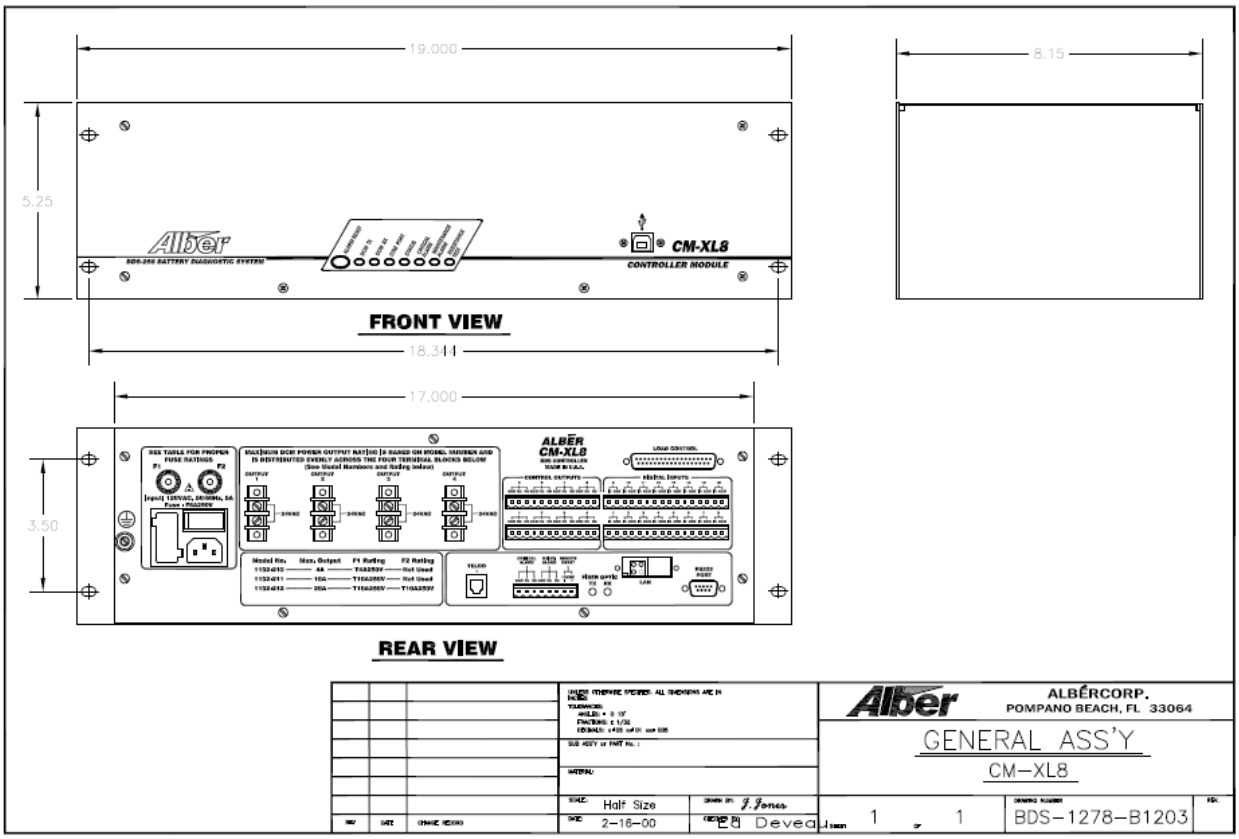

Figure 26. BDS-256XL Front and Rear View General Assembly CM-XL8 Drawing

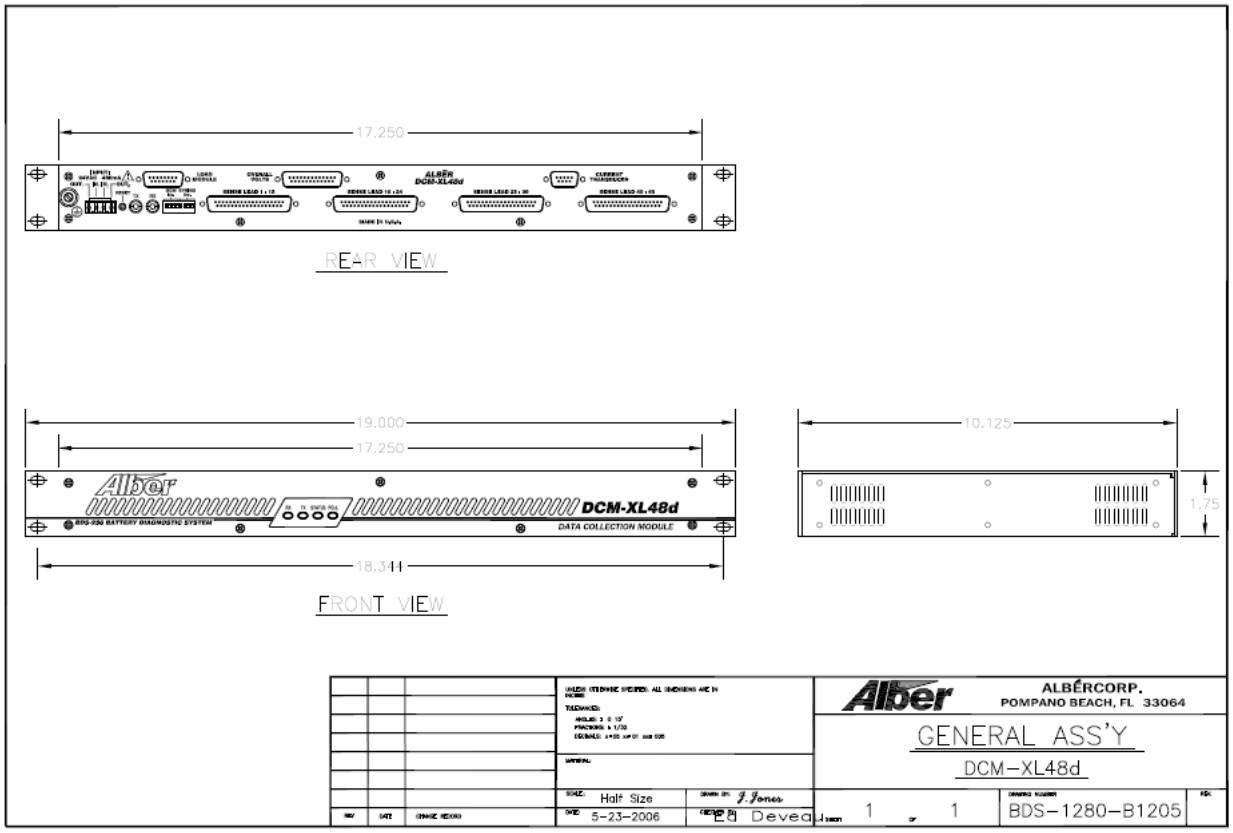

Figure 27. BDS-256XL Front and Rear View General Assembly DCM-XL48d Drawing