



IONPURE®

Touch Panel

**For use with
Ionpure DCR-M
and DC3 Power
Controllers**

**Instruction
Manual**

**IP-MAN-TPDSP-0319-EN
Rev 3
March 2019**

Manual Covers Model #:

**IP-POWERDSP-TP
(W2T829935)**

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Table of Contents

PROPRIETARY RIGHTS STATEMENT	4
MANUAL REVISION HISTORY	4
1 INTRODUCTION	5
1.1 Caution and Warning Messages.....	5
1.2 General Description.....	5
2 INSTALLATION.....	7
2.1 Requirements.....	7
2.2 Panel Mount.....	8
2.3 Connections	9
2.3.1 Connecting the Touch Panel to Power.....	9
2.3.2 Connections to the DCR (Modbus RTU).....	9
2.3.3 Connections to the DC3 Power Controller (Modbus TCP)	9
3 OPERATION.....	10
3.1 Initial Power-Up of Touch Panel Display.....	10
3.2 Control/Navigation Buttons.....	10
3.3 Overview Screen.....	10
3.4 Detail Screen.....	11
4 GETTING STARTED	13
4.1 Setup of Touch Panel IP address.....	13
4.2 Unit ID Selection	13
4.3 Initial Start-up of CEDI System.....	14
4.4 Adjustment of DC Current Output to CEDI Module(s).....	14
5 TROUBLESHOOTING.....	15
6 DC3 ALARM CODES	16
6.1 First position: DC3 Inhibit Alarm Status	16
6.2 Second position: DC3 Warning Alarm Status	16
7 DCR ALARM CODES.....	17
7.1 First position: DCR Inhibit Alarm Status.....	17
7.2 Second position: DCR Warning Alarm Status.....	17

List of Figures

Figure 1: IONPURE Touch Panel Front 6
Figure 2: IONPURE Touch Panel Back..... 6
Figure 3: IONPURE Touch Panel Dimensions 7
Figure 4: Panel Cutout Dimensions..... 8
Figure 5: Installation In Panel..... 8
Figure 6: Overview Screen..... 11
Figure 7: Detail Screen 11

List of Tables

Table 1: Unit ID Selection 13
Table 2: Problem Analysis Chart..... 15

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The operation and maintenance manual should provide complete and accurate information to meet your operating and/or service requirements based on the information available at the time of publication. The information in this manual may not cover all operating details or variations or provide for all conditions in connection with installation, operation and maintenance. Should questions arise which are not answered specifically in this manual, contact your equipment supplier.

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Manual Revision History

Event	Date	Description
Revision 0	October 2016	Original publication
Revision 1	January 2018	Revised content for DC3 Updated images for new screen designs
Revision 2	October 2018	Revised error code tables Added sections on Initial Power Up and Output Current Adjustment
Revision 3	March 2019	Revised to cover software v4.02

1 INTRODUCTION

1.1 Caution and Warning Messages

WARNING and CAUTION labels are used to attract attention to essential or critical information in this manual. The labels are located to the left of the associated messages. Caution and Warning messages will be located immediately before related text.



Warnings indicate condition, practices, or procedures that must be observed to avoid personal injury or fatalities.



Cautions indicate a situation that may cause damage or destruction of equipment or may pose a long-term health hazard.

Notes are also used to draw attention to information. Notes may be located before or after the related text. Notes are used to add information, state exceptions, and point out areas that may be of greater interest or importance.

1.2 General Description

The IONPURE Touch Panel, IP-POWERDSP-TP, is a slim-form operator interface with a bright touchscreen display designed specifically to function as the human interface that allows an operator to control and monitor the IONPURE Digital Communication Rectifier, IP-DCR600V15A-M, and the IONPURE DC3 Power Controller, IP-DC3PH600V-M1.

The touchscreen display employs a bright 480 x 272-pixel touchscreen display for a clear view of data under most lighting conditions. IONPURE and Nexed module operating parameters can be adjusted and screens can be navigated using the on-screen buttons.

The COM (DB-9) port on the back of the unit is used for connection with the DCR Power Controller utilizing an RJ45 to DB-9 to RJ45 cable adapter (included) together with a standard Ethernet cable (CAT 5 or greater, not included). One touchscreen display can independently operate up to sixteen DCR Power Controllers when they are linked together in a daisy chain with standard Ethernet cables.

The RJ-45 port (Ethernet) on the back of the unit is used for connection with the DC3 Power Controller utilizing an Ethernet cable. One touchscreen display can independently operate up to sixteen DC3 Power Controllers when they are linked together in a daisy chain with a standard Ethernet cables.

A 24 VDC, 16-watt external power supply is required with the IONPURE Touch Panel, whether connecting to a DCR Power Controller or a DC3 Power Controller.

The TP software can be updated in the field. See Ionpure Field Service Bulletin IPSB-2019-01-EN.pdf.



Figure 1: IONPURE Touch Panel - front



Figure 2: IONPURE Touch Panel - back

2 INSTALLATION

2.1 Requirements

The IONPURE Touch Panel meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel with the supplied gasket to provide a seal at the panel cutout and it is secured from the back with the provided hardware.

The environmental limits for operation are 0 to 50 °C, at up to 95% relative humidity (non-condensing). Consider the touchscreen's dimensions, shown in Figure 3 below.

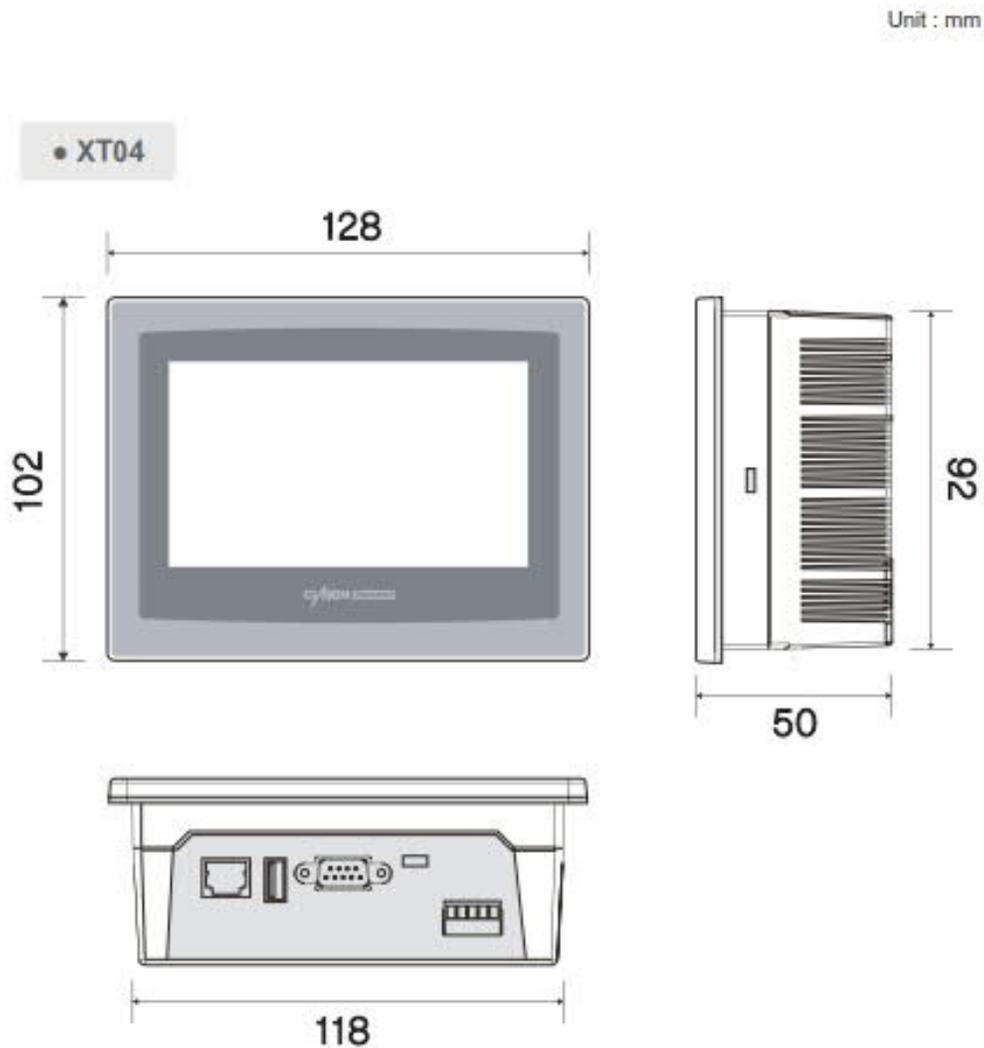


Figure 3: IONPURE Touch Panel Dimensions (mm)



All connections and settings in this section should be made without energizing the power controller(s). Review other safety procedures prior to working in the panel.

2.2 Panel Mount

To mount the IONPURE Touch Panel into a panel:

- Prepare a cutout in the door of the panel as shown in Figure . All cutouts should be clean and free of burrs.

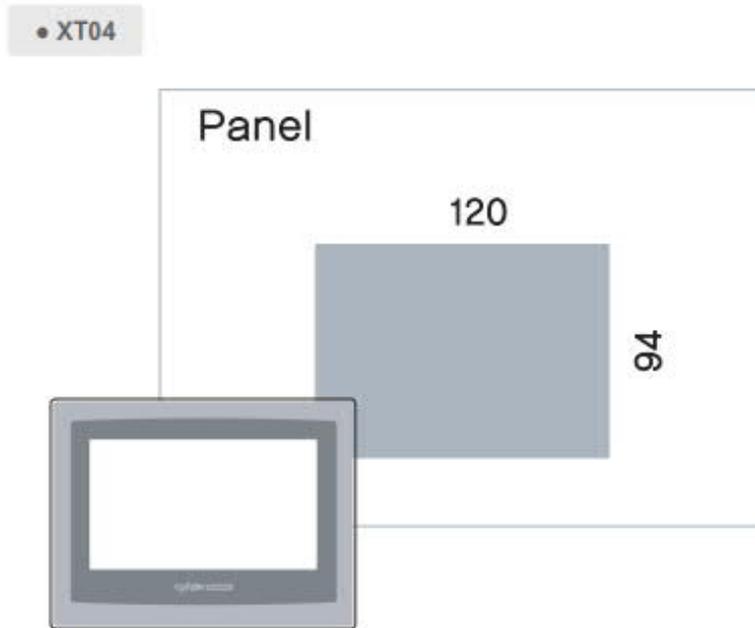


Figure 4: Panel Cutout Dimensions (mm)

- Install the touchscreen on the door of the enclosure using the supplied hardware and gasket.

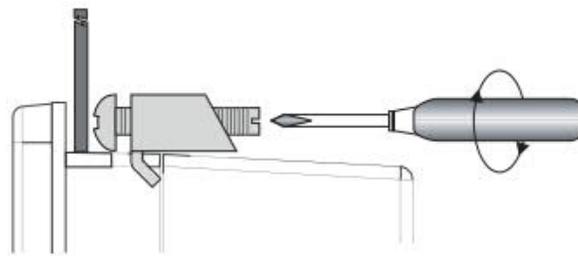


Figure 5: Installation in Panel

2.3 Connections

2.3.1 Connecting the Touch Panel to Power

The IONPURE Touch Panel requires a 24 VDC, 0.65 A (16 watt) power source to power the touchscreen. Use the 3-wire connector supplied with the Touch Panel to provide power to the touchscreen using 18 AWG (1 mm²) or larger wire.

NOTE: Touch Panel software v4.02 allows the Ionpure Touch Panel Display to remember the DC current setpoint(s) after loss of the 24 VDC control power.

Wire Color	Power Supply Output	Touch Panel Input
Red	24VDC+	+
Black	24VDC-	-
Ground/Shield	GND	FG or 

2.3.2 Connections to the DCR (Modbus RTU)

- Connect the DB9-RJ45 adapter (shown below) to the DB-9 port on the back of the display.

Ionpure part number
W2T862236



- Connect one end of a standard Ethernet cable to the adapter.
- Connect the other end of the cable to one of the two RJ45 ports on the first DCR Power Controller.
- For multiple-DCR installations, use additional standard Ethernet cables to daisy-chain other power controllers (up to 16 total).
- Once the power controllers and touch screen are turned on, there should be communication between all devices.

2.3.3 Connections to the DC3 Power Controller (Modbus TCP)

- Connect one end of a standard Ethernet cable to the RJ-45 port on the back of the display. **NOTE: the DB9-RJ45 adapter is not used with the DC3.**
- Connect the other end of the cable to one of the two RJ45 ports on the first DC3 Power Controller.
- For multiple-DC3 installations, use additional standard Ethernet cables to daisy-chain other power controllers.
- Once the power controllers and touch screen are turned on, there should be communication between all devices.

3 OPERATION

3.1 Initial Power-Up of Touch Panel Display

The IONPURE Touch Panel takes about a minute to power up and load the software when power is first applied, as described below (times are approximate).

- Apply 24 VDC control power
- 10 seconds to background page
- 20 seconds to IONPURE Overview / Page 1 screen
- 40 seconds to display 0.0 VDC, 0.0 ADC, 0.00 Ω and the three-bar icon (\equiv).
- 50 seconds to  or  (depends on AC power status of connected power controllers).
- 70 seconds to actual values for volts / amps / ohms.

3.2 Control/Navigation Buttons

LEFT / RIGHT: Press the left \blacktriangleleft or right \blacktriangleright buttons at the bottom of the Overview screen to scroll between the four pages of information (Modules 1-4, 5-8, 9-12, 13-16).

DETAIL: The three-bar icon (\equiv) takes you from the Overview page to the Detail page of the selected power controller.

BACK: Press the red back button  to return to the Overview screen from the Detail screen.

3.3 Overview Screen

This is the startup screen, which provides operational data and access to adjust the DC output current of each power controller, via the Detail screens. There are four overview screens (1 – 4, 5 – 8, 9 – 12, and 13 – 16). Data is grouped as follows:

Module Number: A unique identification number assigned to each power controller that is connected to the IONPURE Touch Panel, so they can be recognized without conflicts.

VDC: Actual DC output voltage from the power controller to the selected CEDI module.

ADC: Actual DC output current from the power controller to the selected CEDI module.

Ω (Ohms): Actual electrical resistance in Ohms (Ω) of the selected CEDI module ($VDC \div ADC$).

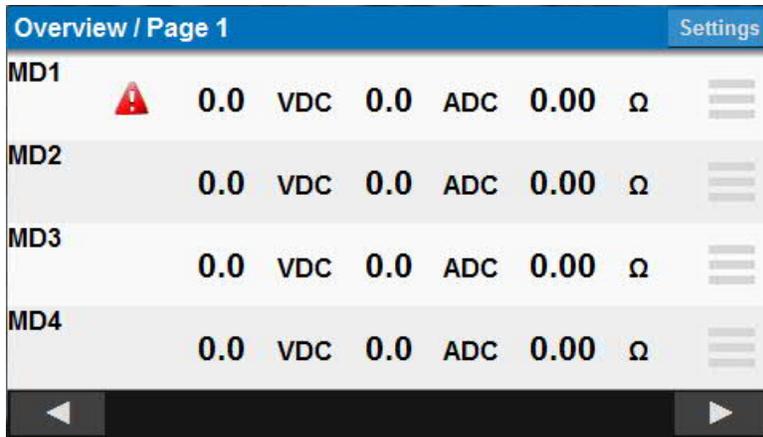


Figure 6: Overview Screen – Page 1 of 4

Unused channels are represented with no (blank) information. If a value cannot be measured, it will be represented with asterisks (*).

A blinking icon on the Overview page indicates an alarm condition for a specific power controller. The alarm type can be identified using the tables in Sections 6 (DC3) and 7 (DCR).

3.4 Detail Screen

There is one selectable screen (per module) accessed from the overview screen, shown below:

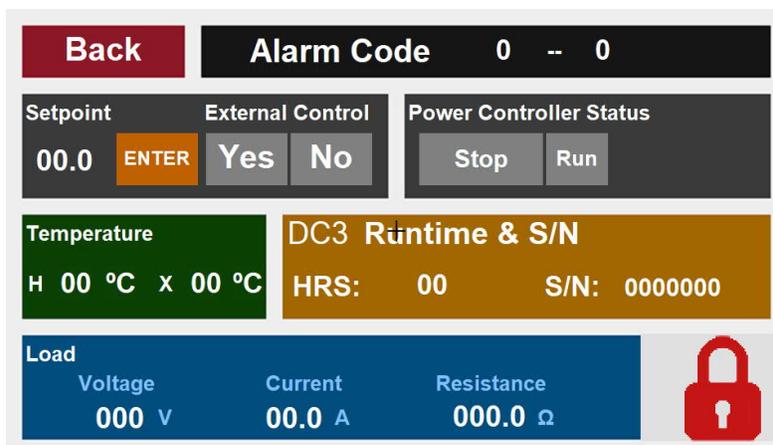


Figure 7: Detail (Current Setpoint) Screen

Data for the Detail/Current Setpoint Screen is grouped as follows:

Alarm Code: The alarm code is represented by two numbers separated by a dash, that indicates the alarm state or fault of the power controller. The first position is the Inhibit Alarm Status, and the second position is the Warning Alarm Status. Alarm codes are given in Sections 6 (DC3) and Section 7 (DCR).

Setpoint: Setpoint for the DC output current from the power controller to the selected CEDI module. Adjust this value using the built-in number pad. This setpoint cannot be set to a value outside the current range selected in the power controller via dip switch.

Enter: This button must be pushed to send the entered setpoint to the DC power controller.

External Control: The default setting is “No”. Changing this setting to “Yes” disables the DC output current control capabilities of the touch panel so an analog device can be used to control the DC output current of the power controller with a 4 – 20 mA signal at terminals Ic+/Ic-.

Power Controller Status: Run is indicated when the unit is in normal operation. Stop can indicate either a Standby or Fault condition.

Temperature: Temperature in degrees Celsius of the power controller heatsink (H) or the transformer (X, DC3 only).

Runtime & S/N: This box shows the type of power controller (DCR or DC3), the power controller time in service (hours), and the power controller serial number (S/N).

Load: Actual DC voltage, DC current, and resistance (DC Voltage ÷ DC Current),

Padlock: This is for locking and unlocking the Setpoint, Enter, and External Control fields.

4 GETTING STARTED

4.1 Setup of Touch Panel IP address

It may be necessary to set the IP address of the touch panel to make sure that it does not conflict with the IP address of a connected DC power controller. The procedure is as follows (requires 24 VDC power):

- Touch the lower left corner, the lower right corner, and then the upper right corner of the active Touch Screen in this order, and it will open a window called “Xpanel Config”. Here, you will press ‘Exit’. After a few seconds the box Ethernet Loader v1.3.5 will be visible.
- Click on the numbers of the IP Address. Click on backspace (BS) and delete “.100” and replace with “.99”. Then click on “Apply this new setting”.
- Click “OK” several times to restart the Touch Panel.

4.2 Unit ID Selection

A unique identification number/letter needs to be assigned to each power controller that is connected to an IONPURE Touch Panel, so they can be recognized without conflicts. This is done via rotary switch of the power controller. Each position corresponds to a channel or module identification number on the display board, as shown in Table 1. If two or more power controllers are mistakenly set to the same rotary switch position, the IONPURE Touch Panel will show asterisks for that channel.

Table 1: Unit ID Selection

Rotary Switch Position	IONPURE Touch Panel Channel	IP Address (for DC3)
0	1	192.168.0.100
1	2	192.168.0.101
2	3	192.168.0.102
3	4	192.168.0.103
4	5	192.168.0.104
5	6	192.168.0.105
6	7	192.168.0.106
7	8	192.168.0.107
8	9	192.168.0.108
9	10	192.168.0.109
A	11	192.168.0.110
B	12	192.168.0.111
C	13	192.168.0.112
D	14	192.168.0.113
E	15	192.168.0.114
F	16	192.168.0.115

4.3 Initial Start-up of CEDI System

The startup sequence depends on the design of the CEDI system. Please consult the Operation Manual for the CEDI system.

The following startup procedure is only an example for a typical single module CEDI system:

- Close the main disconnect switch (or circuit breaker) for the CEDI system.
- Open the appropriate valves and start the pretreatment equipment, such as the reverse osmosis (RO) system, upstream of the CEDI system.
- Adjust the flow rates of the dilute and concentrate streams through the module.
- For each operating channel on the Touch Panel display, adjust the DC current setpoint to the value calculated by the IONPURE Performance Projection Program. See detail in 4.4, below.
- Verify that the DC output is removed when the CEDI module flow is interrupted.



Operation with DC power on and insufficient water flow can cause irreparable damage to the CEDI module(s) and system.

4.4 Adjustment of DC Current Output to CEDI Module(s)

- Once the Touch Panel Overview Page has a green check mark on the left side of the row for a connected power controller, touch the 3-bar icon (≡) on the right to pull up the Detail/Current Setpoint screen for that unit (see Figure 6).
- If the padlock in the lower right corner is red (locked), touch it to pull up the Security box. Enter password 1055 and touch OK. The padlock will change to green (unlocked).
 - Password can not be changed by user.
 - If you try to change or enter the setpoint before you have unlocked the display, a Message box will momentarily pop up saying *Current security level is low*.
- The External Control should be set to NO.
- Touch the setpoint number (initially 0.0) to open an Input Dialog box.
- Enter the desired amperage (from 0-15) and touch OK to close the Input Dialog box. If you enter a number outside the allowable range a box will pop up reminding you it must be between 0 and 15.
- Back at the Detail/Current Setpoint screen hit ENTER (to right of setpoint number) to send the information to the power controller. You will then see numbers populate the Load box (Voltage, Current, Resistance, Power).
- The power controller will maintain the current at that setting if the required voltage to drive the current is lower than the maximum DC voltage available.
- The DC output current may need to be re-adjusted if there is a change in feed water conditions and/or flow rate.

5 TROUBLESHOOTING

Table 2: Problem Analysis Chart

Condition	Possible Causes	Action
Display does not power on	No 24 VDC present, under voltage	Verify 24 VDC, 650 mA is present
	Reverse polarity	Verify 24 VDC, 650 mA is correct polarity
A channel displays asterisks, or blank columns/rows	Bad or incorrect cable(s)	Verify that cable is good (DB9-RJ45 adapter, Ethernet cables) Ethernet cable should NOT be crossover
	Power controller in that channel is not energized	Energize power controller
	Rotary dial position set to a different channel	See Table 1 and make sure rotary dial on the power controller is set for the right channel
	Display and power controller have incompatible firmware revisions	Contact Ionpure to update firmware
A channel row display a blinking icon	Alarm has triggered	Access ALARMS sub-menu to identify the alarm
A channel displays duplicate information	Two or more power controllers set to the same rotary dial position	Set a unique ID to each power controller – See section 4.2
	Display and power controller have incompatible firmware revisions	Contact Ionpure to update firmware
Can't adjust DC output current past a certain value	Current range set too low on DC power controller (dip switch setting).	Select the adequate current range for the CEDI module – See power controller manual
	Power controller has reached maximum DC current output	Verify that input voltage to power controller is adequate Verify that resistance of CEDI module is within specifications
	Voltage limit has reached	Verify DC voltage has reached maximum (90% of AC input voltage)

6 DC3 ALARM CODES

The DC3 alarm code is represented by two numbers, separated by a dash. Together they indicate the alarm state or fault of the power controller.

6.1 First position: DC3 Inhibit Alarm Status

1024	=	I/O Power Supply Failure (Analog Input)
512	=	Loss of Inductor Fan
128	=	Transformer Over Temperature
64	=	DC Link Voltage Low
32	=	DC Link Voltage High
16	=	DC Output Voltage High
8	=	Heatsink Over Temperature
4	=	Over Current Trip (PWM Fault output over current)
2	=	Over Current Trip (PWM Fault input over current)
0	=	No Inhibit Alarm

6.2 Second position: DC3 Warning Alarm Status

64	=	DC Output Short Circuit (Shorted Load)
32	=	DC Output Open Circuit (No Load)
16	=	Transformer High Temperature
8	=	Heatsink High Temperature
4	=	DC Power Limit
2	=	DC Current Limit
1	=	DC Voltage Limit
0	=	No Warning Alarm

NOTE: in the case of multiple simultaneous alarms the values will be added.
For example: I/O Power supply failure (1024) with Input Voltage High (32) = 1056, or
Transformer High Temperature (16) with Heatsink High Temperature (8) = 24.

7 DCR ALARM CODES

The DCR alarm code is represented by two numbers, separated by a dash. Together they indicate the alarm state or fault of the power controller.

7.1 First position: DCR Inhibit Alarm Status

128	=	Watchdog timeout
32	=	Network timeout
16	=	I/O Power supply failure
8	=	Line Phase Loss
4	=	PLL Lock Loss
2	=	Heatsink Over-Temp
1	=	Over Current Trip (PWM Fault input over current)
0	=	No inhibit alarm

7.2 Second position: DCR Warning Alarm Status

1024	=	Network timeout
512	=	Deviation
256	=	Output % high
128	=	Output % low
64	=	Low output
16	=	Shorted SCR
8	=	Heatsink Temp
4	=	Power Limit
2	=	Current Limit
1	=	Voltage Limit
0	=	No Warning Alarm

NOTE: in the case of multiple simultaneous alarms the values will be added.

For example: I/O Power supply failure (16) with Line Phase Loss (8) and PLL Lock Loss (4) = 28, or Deviation (512) with Low Output (64) and Heatsink Temp (8) = 584

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