Market Central ®

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D1000 SERIES LAYER-1 A/B SWITCH

USERS MANUAL

February 2022

Market Central, Inc.

D1000 Standard Models and Part Numbers
(additional models available on request)

FEATURES	CAT6 RJ45	DB9	62.5 um MM, LC	62.5 um MM, SC	62.5 um MM, ST	50 um MM, LC	50 um MM, SC	50 um MM, ST	SM, LC	SM, SC	SM, ST
DATA DEADBOLT D1000 REMOTELY CONTROLLABLE A/B SWITCH MODELS											
latching, manual & dry contact control	6100900	6100984	6100968	6100960	6100964	6100968-50	6100960-50	6100964-50	6100980	6100972	6100976
non-latching, manual & dry contact control	6100901	6100986	6100970	6100962	6100966	6100970-50	6100962-50	6100966-50	6100982	6100974	6100978
latching, manual & dry contact & serial RS232 control	6100902	6100988	6100958	6100954	6100956	6100958-50	6100954-50	6100956-50	6100936	6100938	6100934
non-latching, manual & dry contact & serial RS232 control	6100903	6100989	6100959	6100955	6100957	6100959-50	6100955-50	6100957-50	6100937	6100939	6100935
latching, manual & dry contact & serial RS232 & Ethernet control	6100904	6100985	6100969	6100961	6100965	6100969-50	6100961-50	6100965-50	6100981	6100973	6100977
non-latching, manual & dry contact & serial RS232 & Ethernet control	6100905	6100987	6100971	6100963	6100967	6100971-50	6100963-50	6100967-50	6100983	6100975	6100979

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FEDERAL COMMUNICATIONS COMMISSION
AND INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

1. Specifications

Connectors:
A/B Switch Ports: (3) RJ45 on CAT6 models, (3) DB9F on DB9 models, (3) duplex ST, SC or LC on Fiber Optic models

Ethernet Control Port: (1) RJ45 10Base-T port for remote control interface (E/N controllable models only)
Serial Control Port: Female DB9 (serial controllable models only)
Remote Control/Status Port: (1) 6 Position Terminal Block (12 – 24 AWG wire)

Indicators:
Switch position LEDs: (2) position A and position B
Command status LED: (1) command executing

Switches:
A/B switch control: (2) momentary push button switch for A/B switch port control

Ethernet Management Interface (E/N controllable models only):
10Base-T, Half-Duplex, does not support Auto MDI-X

Power: 100-240VAC, 50/60-Hz wall mount supply, 12VDC output

Power Consumption (typical):

Model	12 VDC load	120 VAC load
Base Model without Serial Control	20 mA DC	15 mA (AC RMS)
Serial Control Model	40 mA DC	20 mA (AC RMS)
Ethernet and Serial Control Model	110 mA DC	35 mA (AC RMS)
Switching Load (CAT6)	Additional 65 mA DC	Additional 20 mA (AC RMS)
Switching Load (DB9)	Additional 80 mA DC	Additional 20 mA (AC RMS)
Switching Load (Multimode Fiber)	Additional 95 mA DC	Additional 25 mA (AC RMS)
Switching Load (Singlemode Fiber)	Additional 75 mA DC	Additional 20 mA (AC RMS)

On latching units, the switching load is applied for approximately 0.15 seconds during switching. On non-latching units, the switching load is constant in the B state, and therefore must be added to the steady state load.

Remote Control Inputs: External dry contact not to exceed 100 ohms resistance including cable.

Output Status Relay Contact Rating: 30 VDC, 1A maximum (resistive)

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Data Rates: switch ports on all models are transparent to data rates, formats & protocols
RJ45 CAT6 models support 10/100/1000 and 10G Ethernet
DB9 models support data rates in excess of 10 Mbps
Fiber Optic models support data rates in excess of 10Gbps

Switch Leads Support: RJ45 CAT6 (all eight leads switched)
DB9 (all nine leads switched all 3 shells tied common)
Fiber Models (Duplex Fiber, 2 fibers per port switched)

Optical Wavelength: 800 through 1600 nm (latching multimode models)
850 and 1310 nm (non-latching multimode models)
1310 and 1550 nm (latching and non-latching single mode models)

Insertion Loss: 2.0 dB maximum (multimode models)
1.5 dB maximum (single mode models)

Optical Isolation: 35 dB minimum (multimode models)
55 dB minimum (single mode models)

Physical: 2.5"(H) 8.1"(W) X 6.25"(D) desktop enclosure, Plastic
4 lbs, including power supply

Switching Durability: 1,000,000 operations

Altitude Tolerance: 10,000 ft. (3048 m)

Temperature Tolerance: Operating: 32° to 122° F (0° to 50° C)
Storage: 14° to 158° F (-10° to 70° C)

Humidity Tolerance: Up to 80% non-condensing

2. Introduction

The D1000 Layer 1 A/B Switch is available in various models with different interface options and user control capabilities. All models provide the same basic A/B switch functionality which is to connect port A or port B to the C (Common) port, through latching or non-latching relays or fiber optic switch mechanisms. For models using latching mechanisms, the connection state will be maintained if power fails or is removed. Non-latching versions will revert to the port C to port A connection state when power is lost, and will remain in that state when power is restored until a new switch command is received.

Manual control of the switch port connection state is supported through pushbutton switches on the front of the unit. A 6 position terminal strip on the rear of the unit provides remote control capability and accepts external dry contact closures as inputs. See section 5.1 and section 5.2 for additional details

Models with Serial control capability include an RS232 console port that can be used to control the switch port connection state, as well as monitor switch status using a serial RS232 terminal type device. See section 5.3 and section 7 for additional details.

Models with Ethernet control include an Ethernet network interface that can be used to control the switch port connection state, as well as monitor switch status via a web browser, telnet, or using SNMP. These models also have intelligent automatic switching capabilities which are described in section 5.5 and section 7, and they support sending SNMP traps or syslog messages (user configurable) for various events and errors. See section 10 and section 11 for additional details.

3. Configuration

There are no user configurable settings on the D1000 A/B Switch models for basic operation. There are some parameters related to Ethernet remote access / control operations which are configurable through the serial RS232 port. These settings are described later in this manual.

The internal jumpers and DIP switches inside the D1000 A/B Switch have been pre-configured at the factory and should not be changed from their default settings. They are shown here for reference only.

Jumper W1   1-2 position = no Ethernet control module
              2-3 position = Ethernet control module installed

Jumper W2   1-2 position = no Ethernet control module
              2-3 position = Ethernet control module installed

Dipswitch SW1 (resistors may be installed for "closed" positions)
              Position 1: open – Latching Relays, closed – Non-Latching Relays
              Position 2: open – No Ethernet control module, closed – Ethernet control module installed
              Positions 3 thru 8: open (reserved for future use)

4. Installation

- Find a location suitable for installing the D1000 A/B Switch, with access to AC power and the connections you intend to switch through the unit.
- If you intend to use serial control, connect a serial cable to the DB9 RS232 console port. The baud rate is fixed at 9600 baud, no parity, 8 data bits, and 1 stop. See table 6.1 for the console port connector pin assignments.
- If you intend to use external dry contact closures to control the D1000, connect the external contacts to the 6 position terminal block as described in section 5.2.
- Connect the provided 12 VDC power supply to an AC source and to the 3.5 mm power supply connector on the D1000. When power is first applied, it is recommended that the user change connection states on the D1000 switch from A to B and back again to be sure that all the relays are in a known state, prior to connecting any external devices. Press and hold (for approximately 1 second) the appropriate front panel pushbutton switch until the D1000 A/B Switch changes connection state. One of the LEDs, A or B, on the front of the unit will indicate the selected connection state and also serves to show that the switch has power.
- Depending on the model of the D1000 being installed, connect RJ45 cables, DB9 cables or fiber optic cables between the A, B and C ports on the switch and your devices. The D1000 A/B Switch connects the C (Common) port to either the A or B port. Note that the D1000 A/B Switch ports provide straight thru connections and are bidirectional, i.e. they have no preference to signal direction. If your application requires a cross-over cable, use only 1 cross-over cable in that path. Use a straight through cable on the other side of the switch.
- If you are connecting the Ethernet control interface on the D1000 A/B Switch to your network, you must first set the IP address, subnet mask and gateway address parameters of the D1000 using the serial port. You should set these parameters before attaching a cable to the NETWORK port, as the default parameters may not work or could interfere with the operation of your Ethernet network. See section 6 for more information regarding IP setup.

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5. Operation

When power is applied to the D1000 A/B Switch, one of the LED switch position indicators (A or B) on the front of the unit will illuminate to show the connection state of the switch. Indicator A lights when the switch is in position A, and Indicator B lights when the switch is in position B. If neither or both LEDs are lit, then a fault has occurred, or power has been removed.

The STATUS LED will blink while performing a switching action. On Ethernet controllable models, the STATUS LED will also blink whenever the internal processor receives a command from the internal Ethernet module.

5.1 Manual Switching

All D1000 A/B Switch models can be manually switched using the push button switches located on the front of the unit. To select the connection state, the appropriate push button switch must be held for one second before the unit will switch. This is to minimize the risk of inadvertently switching the D1000 A/B Switch.

5.2 Dry Contact Closure Switching

You can also switch connection states and monitor the status of the D1000 switch using the remote control connections on the six position terminal block, located on the rear of the unit. Connecting (shorting) input A (pin 1) to Ground (pin 2) for a minimum of approximately 100 msec will cause the unit to switch to the A position, and connecting (shorting) input B (pin 3) to Ground (pin 2) for a minimum of approximately 100 msec will cause the unit to switch to the B position. If desired, the A or B control input can remain connected to the Ground input, which will disable all other control interfaces including the front panel pushbutton switches from being able to switch connection states of the D1000. Note that to insure reliable operation, the external dry contacts and any associated cable connected to the 6 position terminal block should not exceed 100 ohms resistance. Once the D1000 A/B Switch has switched connection states, the status relay contact pin 5 will be internally connected (shorted) to either pin 4 (switch in position A) or pin 6 (switch in position B). See table 5.1 for the pin assignments on the 6 position terminal block.

Pin 1	A control input
Pin 2	Ground
Pin 3	B control input
Pin 4 (connected to pin 5 = A)	Status Relay A contact
Pin 5	Status Relay COMMON
Pin 6 (connected to pin 5 = B)	Status Relay B contact

Table 5.1 Six position terminal block pin assignments

5.3 Serial RS232 Switching

D1000 models that support serial remote control can be switched using commands over a serial RS232 communications line. The parameters of the D1000 console port are fixed at 9600 baud, no parity, 8 data bits, and 1 stop bit (commonly abbreviated as 9600, 8, N, 1). To communicate with the D1000 you will need a serial terminal or similar device configured to these settings. Use a straight thru M/F cable to connect the D1000 console connector to this terminal or other device that follows the standard IBM PC DB9 serial port pinout. See table 6.1 for the D1000 console port connector pin assignments.

When the D1000 A/B Switch powers up, it will send a sign-on message followed by a prompt character ">" to your serial terminal device. After each command and the associated response, the D1000 will again issue a prompt

character. For systems where the console port is being commanded by software, the software should wait for this prompt character before sending each and every command to the D1000 A/B Switch. All commands are case insensitive and can be entered in upper or lower case. Note however, that password parameters are case sensitive. All commands must be terminated with a carriage return (ASCII 13 or hex 0x0D) before they will be accepted by the D1000. Several commands can be abbreviated by using just the first character of each command word, for example the set/get system commands can be abbreviated using "g s" for "get system" or "s s a" for "set system a".

5.3.1 Serial RS232 Switching on models without Ethernet modules

Typing the word "help" or typing the question mark character "?" followed by a carriage return will cause the D1000 to display a list of available commands. Models of the D1000 that include an RS232 console port but that do not also include an Ethernet module support a basic set of serial commands as shown in the example output below.

```
>help

Rev. D1.D
Commands:
get system
set system X (X = A or B)
help or ? (displays this list)
>
```

These commands allow you to switch connection states to either the A or B state by using the "set system A" command or the "set system B" command, and you can query the switch port connection status by using the "get system" command.

5.3.2 Serial RS232 Switching on models with Ethernet modules

D1000 A/B Switch models that have an Ethernet module installed support the same serial commands as listed in section 5.3.1 above, but also include a number of additional commands. These additional commands provide access to the configuration parameters and auto switching features that are supported via the Ethernet module. Refer to section 7 for a complete list of the enhanced console commands.

5.4 Ethernet Switching

D1000 A/B Switch models that support Ethernet remote control can be switched using commands sent over an Ethernet network. In order to use the Ethernet Network port on the D1000 you must set the IPADDRESS, SUBNETMASK and GATEWAY address parameters before connecting to your network. See section 6 for more details on how to do this. After setting up the system and powering up for the first time, you may also need to change other parameters for your application. All configuration parameters are stored in non-volatile memory. They are immediately active when a change is made, but they will not become permanent until the SAVE command, followed by the RESET command has been executed.

Once the Ethernet remote control port has been configured, the D1000 can be switched using SNMP commands - see the MIB path summary in the appendix for a list of SNMP variables and their functions.

The D1000 A/B Switch also supports remote telnet access, and can be controlled via a telnet session using the same commands as supported by the RS232 serial interface. Refer to section 7 for the complete list of console commands.

As an additional option, D1000 models that support Ethernet remote control also include a built in http server application that allows all of the console commands listed in section 7 to be accessed via a web browser interface. See section 8 for more details about the web browser interface feature.

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The D1000 also has the ability to issue either SNMP traps, or UDP syslog messages. These messages can be sent to one or more network administrator systems to provide notification when the D1000 changes connection states either automatically (auto bypass switching or auto recovery switching) or via manual control (front panel toggle switch or commands received on the RS232 or Ethernet interfaces), and when certain other events occur. See section 10 and section 11 for additional details.

To restrict access to the D1000, each of the Ethernet interface options (SNMP, telnet, and web browser) can be independently enabled/disabled, and if enabled, can be configured to require a login password. Additionally, user access can be restricted by IP address so only commands received from pre-defined "administrator" IP addresses will be acknowledged and acted upon. See section 7 for additional information regarding these commands.

5.5 Automatic Switching

The D1000 A/B switch models that support Ethernet remote control can also be configured to automatically switch the connection state (port C connected to port A or port C connected to port B). In order to be able to perform the auto-switching functions, the D1000 issues ICMP echo request (PING) packets from its Ethernet network interface to a user configurable IP address on the network. The auto-switching function can be configured to operate in one of two modes. In FAILOVER mode (the default mode), the auto-switching function switches to the "failover" or "bypass" connection state (port C connected to port A) when PING responses are not received, and if configured to "auto recover" it switches to the "normal" connection state (port C connected to port B) when PING responses are received. In TOGGLE mode, the auto-switching function toggles the connection state from A to B or from B to A when PING responses are not received, and maintains the connection state port C connected to port A or port B when PING responses are received. User configurable parameters control the auto-switching functions to allow the switch to be used in a variety of applications.

In FAILOVER mode, if the "normal" network path connections between the D1000 and the device being monitored go down for any reason, the D1000 will no longer be able to PING the specified IP address, and will then automatically switch from the "normal" connection state (port C connected to port B) to the "bypass" or "failover" connection state (port C connected to port A). Once the problems on the primary path have been identified and corrected, the user can issue a command to cause the D1000 to switch from the failover connection state back to the normal connection state. If auto recovery is enabled, the D1000 will automatically re-connect the normal path connections when it is again able to PING the user specified IP address. When using the auto recovery feature, it is important that the Ethernet network port on the D1000 be connected to the user's network such that the normal path is continuously being monitored even when the backup path has been selected, otherwise the D1000 could repeatedly switch (flap) back and forth between the failed primary path and the functioning backup path.

In TOGGLE mode, if the "current" network path connections between the D1000 and the device being monitored go down for any reason, the D1000 will no longer be able to PING the specified IP address, and will then automatically switch to the "alternate" connection state, trying to restore successful PING responses. In this mode, the auto-switching function will toggle between (port C connected to port B) and (port C connected to port A), until it receives responses to its PING requests. The D1000 will then remain in the current connection state (port C connected to port B or port C connected to port A), until the user issues a command to cause the D1000 to switch connections, or should the D1000 fail to receive PING responses. When in TOGGLE mode, it is important that the D1000 Ethernet network port be connected to the user's network such that the current path is being monitored.

See the diagrams below for examples of auto switching configurations.

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Network Connections for Auto Failover & Manual Recovery (FAILOVER mode) OR TOGGLE mode

Note: The D1000 monitors the WAN connections by PINGing the far side router thru the primary WAN link. In FAILOVER mode, if the primary WAN link fails, the D1000 auto switches to the backup WAN link. Auto recovery is disabled in this configuration to prevent flapping. In TOGGLE mode, if the selected WAN link fails, the D1000 will toggle between the primary and backup WAN until a working link is established.
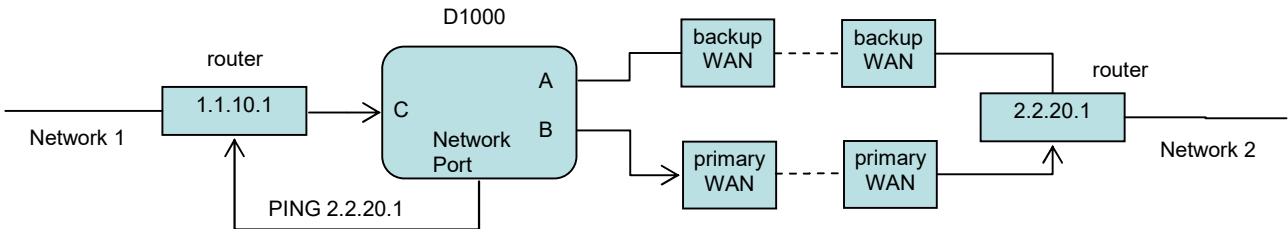
Network Connections for Auto Failover & Auto Recovery (FAILOVER mode)

Note: The D1000 monitors the WAN connections by PINGing the far side router thru the primary WAN link. If the primary WAN link fails, the D1000 auto switches to the backup WAN link. When the primary WAN link is available again, the D1000 auto switches back to the primary. This configuration will not function properly in TOGGLE mode, since the connection between the D1000 Network Port and the far side router is not affected by switching the C port connection state.
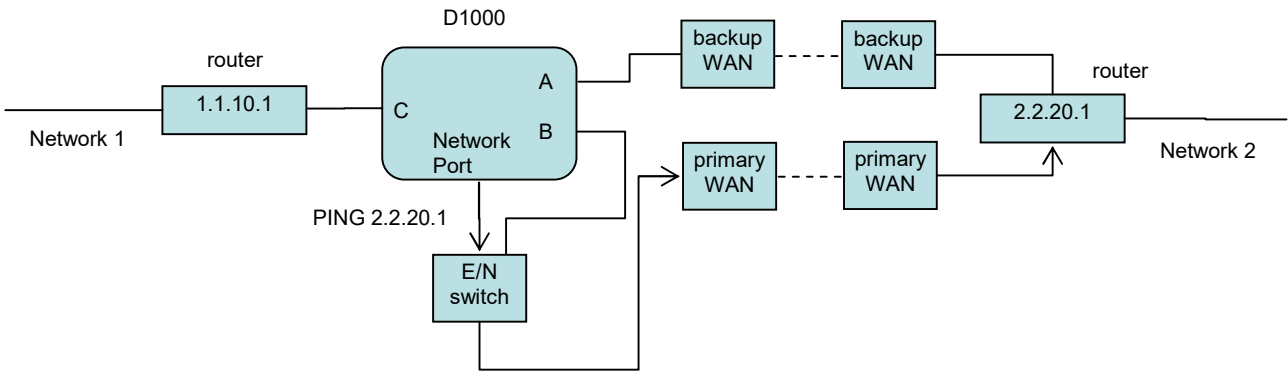
In most network environments, you can configure the D1000 to automatically determine the proper MAC address required for the PING packet. Enter the monitorip address of the device to be monitored, and leave the monitormac address parameter set to the default value 00 00 00 00 00 00. This causes the D1000 to issue an ARP request to determine the appropriate MAC address for the PING packet. To eliminate the D1000 ARP request, enter the monitormac address as follows. If the monitored device is on the same subnet as the D1000's internal Ethernet node, set the monitormac address to the MAC address of the monitored device. If the monitored device is on a different subnet than the D1000's internal Ethernet node, set the monitormac address to the MAC address of the gateway router, so the gateway router can route the PING packet to the target device on a different subnet.

NOTE: When the Auto Switch feature is enabled, manual switching can be performed, but will be overridden by any auto switching commands that are subsequently issued by the D1000.

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6. Ethernet Network Interface Setup (Ethernet remote control capable models)

To perform initial setup of the network management interface on the D1000 you will need a serial terminal capable of 9600 baud, no parity, 8 data bits, and 1 stop bit. Connect this terminal to the DB9 console connector on the D1000. A straight thru M/F cable is required to connect to an IBM PC standard DB9 serial port. For connection to other device types a custom cable pinout may be required - see Table 6.1 below for the DB9 pin assignment on the D1000.

Table 6.1 – DB9 Pin Assignment

DB9	SIGNAL	DIRECTION
2	RECEIVED DATA	TO TERMINAL
3	TRANSMITTED DATA	FROM TERMINAL
5	GROUND	

Apply power to the system.

After initialization is complete you will see a sign-on message displayed on the serial console, e.g.

```
Network Agent Version 2.9U MAR 2016
Copyright (c) 2016
All rights reserved
System starting ...
Rack position A
Console ready

>
```

At this point the D1000 is ready to accept the configuration commands that are necessary before you will be able to communicate with the unit over an Ethernet network. You will need to enter an IP address, subnet mask, and gateway address information for basic access. You will also need to set the read and write SNMP community names if using SNMP, or a web password to allow web browser access, or a telnet password if you plan to control the D1000 via telnet. After entering these parameters you will need to save them into non-volatile memory on the D1000. Any time one or more of these parameters is changed; they must be saved followed by a system RESET in order for the changes to become permanent. The following shows a typical setup session. Change the entered parameters to suit your application requirements. All of the console level commands are described in detail in section 7.

```
>set ipaddress 192.168.1.200
IP Address: 192.168.1.200

>set subnetmask 255.255.255.0
Subnet Mask: 255.255.255.0

>set gateway 192.168.1.1
Gateway IP Address: 192.168.1.1

>set readcommunityname public
Read Community Name: public

>set writecommunityname private
Write Community Name: private

>save
saving...

>reset
resetting, please wait...
```

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After the system reinitializes, you will again be greeted by the sign-on message as before. At this time you can connect an Ethernet cable to the 10Base-T network port on the D1000 A/B Switch and to an available port on your Ethernet switch or router. The D1000 will respond to SNMP, telnet and HTTP messages at the assigned IP address.

7. Console Commands

The following commands are available from the RS232 console port or from the Ethernet network port on models of the D1000 that support these remote control interfaces. All commands are case insensitive, although several parameters are case sensitive (read/write community names and web and telnet passwords). All commands must be terminated with a carriage return (ASCII 13 or hex 0x0D) before they will be accepted by the D1000. GET, SET, SYSTEM, and ALL can all be abbreviated by the first letter of the command. This allows shorthand entry of switching commands. Each available command is shown along with an example of a typical response.

GET ALL
Displays all parameters and settings. An example output is shown here.

```
System Status: B
IP Address: 192.168.1.30
MAC Address: 00 06 57 00 00 01
Subnet Mask: 255.255.255.0
Gateway IP Address:  192.168.1.1
PING Reply: Enabled
SNMP Enable: Enabled
Read Community Name: public
Write Community Name: private
Web Enable: Enabled
Web Password: mctech
Web Timeout: 300
Web Port: 80
Telnet Enable: Enabled
Telnet Password: dataman
Telnet Timeout: 80
Telnet Port: 23
Monitor IP Address: 0.0.0.0
Monitor MAC Address: 00 00 00 00 00 00
Monitor Interval: 10
Monitor Fail Count: 5
Monitor OK Count: 5
Monitor Delay Count: 0
Monitor Mode: FAILOVER
Authentication Trap: Disabled
Alert Type: TRAP
Model 3: 2.9U MAR 2016, Rev. D1.D
ADMIN IP Addresses:
SNMP Managers:
1: 192.168.1.113
2: 192.168.1.115
```

GET VERSION
Displays the software revision of the system.

```
Model 3: 2.9U MAR 2016, Rev. D1.D
```

GET SYSTEM
Displays the system status. This is the same as the status returned by the SNMP variable d1000SwitchControl. It will report "A" if the switch is in position A, and "B" if the switch is in position B.

```
System Status: B
```

SET SYSTEM A[B]
Sets the system to position A or B.

SET IPADDRESS X.X.X.X
GET IPADDRESS
Set or display the current IP address of the network module. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET SUBNETMASK X.X.X.X
GET SUBNETMASK
Set or display the current subnet mask of the network module. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET GATEWAY X.X.X.X
GET GATEWAY
Set or display the current gateway IP address of the network module Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET PINGREPLY ON[OFF]
GET PINGREPLY
Set or display whether or not the D1000 will respond to incoming PINGs (ICMP echo requests). Any change will not become permanent until a SAVE operation is performed.

SET SNMPENABLE ON[OFF]
GET SNMPENABLE
Set or display whether or not the SNMP interface on the D1000 is enabled. Any change will not become permanent until a SAVE operation is performed.

SET READCOMMUNITYNAME string
GET READCOMMUNITYNAME
SET WRITECOMMUNITYNAME string
GET WRITECOMMUNITYNAME
Set or display the current read or write community name as specified. Note that in general these are case sensitive fields. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBENABLE ON[OFF]
GET WEBENABLE
Set or display the current state of web based access. The network module will not accept any HTTP requests when web enable is off. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBPASSWORD string
GET WEBPASSWORD
Set or display the current web password. Note that this is a case sensitive field. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBTIMEOUT seconds
GET WEBTIMEOUT
Set or display the current web timeout in seconds. After a period of inactivity of this many seconds, the network module will request a login. Note that the web timeout cannot be disabled any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET WEBPORT N
GET WEBPORT
Set or display the current web port number. Changing the web port number from the default can be used to provide an additional level of security. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETENABLE ON[OFF]
GET TELNETENABLE
Set or display the current state of telnet based access. The network module will not accept any telnet requests when telnet enable is off. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETPASSWORD string
GET TELNETPASSWORD
Set or display the current telnet password. Note that this is a case sensitive field. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETTIMEOUT seconds
GET TELNETTIMEOUT
Set or display the current telnet timeout in seconds. After a period of inactivity of this many seconds, the network module will disconnect any current telnet session. Note that the telnet timeout cannot be disabled, it can however, be set arbitrarily large. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET TELNETPORT N
GET TELNETPORT
Set or display the current telnet port number. Changing the telnet port number from the default can be used to provide an additional level of security. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET MONITORIP [X.X.X.X]
GET MONITORIP
Set or display the IP address of the device that the D1000 A/B Switch is to PING to determine the appropriate auto-switching action. Setting this to 0.0.0.0 disables the auto-switching function. Any change will not become permanent until a SAVE operation is performed. When the auto-switching function is enabled, the D1000 will send PING packets to the specified MONITORIP address and perform auto-switching actions dependent on the selected MONITORMODE and dependent on weather or not the PING responses are received.

SET MONITORMAC [X X X X X X]
GET MONITORMAC
Set or display the MAC (Ethernet) address of the device that the D1000 A/B Switch is to PING to determine the appropriate auto-switching action. This value is entered as a series of six HEX characters with spaces between each HEX character. If the MONITORMAC address is set to 00 00 00 00 00 00, the D1000 A/B Switch will automatically determine the proper MAC address required for the PING packet by issuing an ARP request. You can also manually set the MONITORMAC address. If monitoring connectivity to a device on the same subnet as the D1000 A/B Switch internal Ethernet node, set the MONITORMAC address parameters to the MAC address of the device being monitored. If monitoring connectivity to a device on a different subnet/network than the D1000 A/B Switch internal Ethernet node, set the MONITORMAC address parameter to the MAC address of the gateway router on the D1000 A/B Switch subnet. Any change will not become permanent until a SAVE operation is performed.

SET MONITORINTERVAL [N]
GET MONITORINTERVAL
Set or display the time interval between PINGs issued by the internal Ethernet node in the D1000 A/B Switch, measured in 100 millisecond increments. To issue PINGs every 1.5 seconds, set this value to 15. The valid range is 1 to 255 (0.1 seconds to 25.5 seconds). A value of 0 disables the auto-switching function. Any change will not become permanent until a SAVE operation is performed.

SET MONITORFAILCOUNT [N]
GET MONITORFAILCOUNT
Set or display the Monitor Fail Count. In FAILOVER mode, this is the number of successive PING attempts that must fail before the D1000 automatically switches to the "failover" or "bypass" connection state (port C connected to port A). The valid range is 1 to 255. A value of 0 causes an auto-switching "failover" action for every failed PING attempt. In TOGGLE mode, this is the number of successive PING attempts that must fail before the D1000 automatically toggles the connection state (A to B, or B to A); see also Monitor Delay Count. Any change will not become permanent until a SAVE operation is performed.

SET MONITOROKCOUNT [N]
GET MONITOROKCOUNT
Set or display the Monitor OK Count. This parameter is not used in TOGGLE mode. In FAILOVER mode, this is the number of successive PING attempts that must succeed before the D1000 A/B Switch automatically switches to the "normal" connection state (port C connected to port B). The valid range is 1 to 255. A value of 0 disables only the automatic recovery function – automatic switching will still operate if enabled. If auto recovery is disabled the user must manually switch back to the normal path via the front panel switch or by issuing a "set system B" command. Any change will not become permanent until a SAVE operation is performed.

SET MONITORDELAYCOUNT [N]
GET MONITORDELAYCOUNT
Set or display the Monitor Delay Count. This parameter is not used in FAILOVER mode. In TOGGLE mode, this is the number of successive PING attempts which are ignored after toggling the connection state. This can be thought of as a "blank-time" after a switching action to allow the new connection to be established. If the Monitor Delay Count is set to a non-zero value, and the new connection state is also "down", the D1000 attempts to PING MONITORDELAYCOUNT (ignored) plus MONITORFAILCOUNT (failed) times before switching back to the original connection state. The valid range is 0 to 255. Any change will not become permanent until a SAVE operation is performed.

SET MONITORMODE [FAILOVER/TOGGLE]
GET MONITORMODE
Set or display the Monitor Mode. In FAILOVER mode, the auto-switching function switches to the "failover" connection state (port C connected to port A) when PING attempts fail, and if configured to auto-recover, switches to the "normal" connection state (port C connected to port B) when PING attempts succeed. In TOGGLE mode, the auto-switching function toggles the connection state (A to B, or B to A) when PING attempts fail, and maintains the connection state when PING attempts succeed. Any change will not become permanent until a SAVE operation is performed.

SET AUTHENTICATIONTRAP ON[OFF]
GET AUTHENTICATIONTRAP
Set or display the current state of authentication error traps. Authentication traps will be generated when this parameter is set to ON, and not when OFF. Note that this setting only affects the trap generation, and not how the network module handles an authentication failure. An authentication failure generally means that an SNMP access was attempted with an incorrect community name. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

SET ALERTTYPE [TRAP/SYSLOG]
GET ALERTTYPE
Set or display the type of alert messages sent by the D1000 A/B Switch when certain events such as a change in switch state occur. The D1000 A/B Switch can be configured to issue either syslog messages, or SNMP traps. Note that at least one IP address must be entered using the "SET MANAGER N X.X.X.X" command before either syslog messages or traps will be issued. See section 9 for a list of the traps supported by the D1000 A/B Switch, and see section 10 for a list of the supported syslog messages.

SET ADMINIP N X.X.X.X

Set administrator N (1-8) IP address. Up to 8 different administrator IP addresses can be entered. To remove an entry from the list, set the IP address to 0.0.0.0. If all 8 ADMIN IP addresses are 0.0.0.0 (no ADMIN IP addresses are configured) the D1000 will allow access via the Ethernet interface from any IP address, subject to the existing password and enable flags for each interface. If one or more ADMIN IP addresses are non-zero, the D1000 will only process messages received from the configured (non-zero) ADMIN IP addresses. All other messages will be ignored. This ADMIN IP address filtering feature applies to the telnet, web browser and SNMP Ethernet interfaces and to the PING reply functions. The ADMIN IP address filtering does not affect outgoing PING and ARP messages so the D1000 is still able to monitor any IP address for the "auto-switch" features. The administrator IP addresses can be different than the manager IP addresses. Any change will not become permanent until a SAVE operation is performed.

GET ADMINIP N

Display the IP address of administrator N (1-8). If no value is entered for "N", then all administrator IP addresses will be displayed.

```
ADMIN IP Addresses:
1: 192.168.1.113
2: 192.168.1.115
```

SET MANAGER N X.X.X.X

Set SNMP manager N (1-16) IP address. Up to 16 SNMP MANAGER IP addresses can be entered for destinations of trap messages. Trap messages will be sent to all enabled MANAGER IP addresses. To remove an entry from the list, set the IP address to 0.0.0.0. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

```
SNMP Managers:
1: 192.168.1.113
2: 192.168.1.115
```

GET MANAGER N

Display SNMP manager N (1-16) IP address.

GET MANAGER

Display all SNMP manager IP addresses.

PING X.X.X.X

Causes the D1000 to issue a single ICMP echo request packet to the designated IP address. If a response is received, the D1000 will display the message "Reply from X.X.X.X". If no response is received within 5 seconds, the D1000 will display the message "Request timed out".

SAVE

Save settings for next startup. All settings are stored in NV memory and restored upon power on. Any change will not become permanent until a SAVE and RESET operation sequence is performed.

RESET

Causes a network system reboot and reloads all parameters from stored settings. Note that you will lose your connection and have to log in again if giving this command from a telnet or web interface session.

SET DEFAULTS

Causes the D1000 configuration parameters to be restored to the factory settings. Any changes to the settings will not become permanent until a SAVE and RESET operation sequence is performed.

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?
HELP
Displays a list of console commands.

```
CONSOLE COMMANDS:
GET          ALL (display all parameters)
GET          VERSION (display software versions)
GET[SET]     SYSTEM [A/B]
GET[SET]     IPADDRESS [X.X.X.X]
GET[SET]     SUBNETMASK [X.X.X.X]
GET[SET]     GATEWAY [X.X.X.X]
GET[SET]     PINGREPLY [ON/OFF]
GET[SET]     SNMPENABLE [ON/OFF]
GET[SET]     READCOMMUNITYNAME [string]
GET[SET]     WRITECOMMUNITYNAME [string]
GET[SET]     WEBENABLE [ON/OFF]
GET[SET]     WEBPASSWORD [string]
GET[SET]     WEBTIMEOUT [N] (seconds)
GET[SET]     WEBPORT [N]
GET[SET]     TELNETENABLE [ON/OFF]
GET[SET]     TELNETPASSWORD [string]
GET[SET]     TELNETTIMEOUT [N] (seconds)
GET[SET]     TELNETPORT [N]
GET[SET]     MONITORIP [X.X.X.X] (0.0.0.0 to disable)
GET[SET]     MONITORMAC [X X X X X X] (X = HEX CHARS)
GET[SET]     MONITORMODE [FAILOVER/TOGGLE]
GET[SET]     MONITORDELAYCOUNT [N]
GET[SET]     MONITORINTERVAL [N] (1/10 seconds, 0 to disable)
GET[SET]     MONITORFAILCOUNT [N]
GET[SET]     MONITOROKCOUNT [N] (0 = no auto recover)
GET[SET]     AUTHENTICATIONTRAP [ON/OFF]
GET[SET]     ALERTTYPE [TRAP/SYSLOG]
GET[SET]     ADMINIP N [X.X.X.X] (0.0.0.0 to disable an entry)
GET          ADMINIP (display all administrator IP addresses)
GET[SET]     MANAGER N [X.X.X.X] (0.0.0.0 to disable an entry)
GET          MANAGER (display all SNMP managers)
PING         X.X.X.X (ICMP ECHO to remote host)
SAVE         save settings for next startup
RESET        restart (use after SAVE)
SET          DEFAULTS (restore default user settings, save required)
```

Notes:
- Commands can be entered in upper or lower case. Passwords are case sensitive.
- All commands must be terminated with a carriage return (ASCII 13) or (hex 0x0D).

8. Web Interface (Ethernet remote control capable models)

The network module installed in Ethernet remote control capable models of the D1000 also provides access to console commands through a web browser interface. When enabled (see SET WEBENABLE command) entering the D1000's IP address (index.html) in your web browser's URL address line will present a log on page for the D1000 similar to the following example. **Note:** If using a pop up blocker on your web browser, be sure to allow pop ups from the IP address of the D1000 A/B Switch, otherwise you could experience trouble receiving a response through the interface.

Web Interface Version 1.0
Copyright (c) 2016.
All rights reserved.

Please logon:

Password: [   ]

[Submit]

Figure 8.1 Logon Screen

After successfully entering the correct web password (see SET WEBPASSWORD command) you will get the following page (or similar).

Web Interface Version 1.0
Copyright (c) 2016.
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Command console:

Enter new command: [   ]

[Send Command]   [Logoff]

Figure 8.2 Initial Command Screen

At this point you may enter any valid command into the text box and click "Send Command" to execute. The following is an example result of the GET SYSTEM command.

Web Interface Version 1.0
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Command console:

Output from last command...

System Status: A

Enter new command: [   ]

[Send Command]   [Logoff]

Figure 8.3 Example Command Results Screen for GET SYSTEM command

The D1000 A/B Switch will only allow 1 telnet or web access session. To free up a session without waiting for the web timeout, click "Logoff". For this reason, the web timeout should be set to a workable time. Resetting the D1000 will also clear the current web session.

9. SNMP MIB Path Summary

[internet] – 1.3.6.1
  [private] – 1.3.6.1.4
    [enterprises] – 1.3.6.1.4.1
      [mctech] – 1.3.6.1.4.1.9477

[mctech] – 1.3.6.1.4.1.9477
        Market Central, Inc. private enterprise number

[mcAgent] – 1.3.6.1.4.1.9477.1
        Market Central, Inc. SNMP Agent

The following is a list of the SNMP variables corresponding to:
D1000 A/B Switch.

[d1000] – 1.3.6.1.4.1.9477.1.7
        D1000 Switch

        [d1000SwitchControl] – 1.3.6.1.4.1.9477.1.7.1
        [d1000KeyStat] – 1.3.6.1.4.1.9477.1.7.2
        [d1000PowerStat] – 1.3.6.1.4.1.9477.1.7.3
        [d1000SoftwareVersion] – 1.3.6.1.4.1.9477.1.7.4
        [d1000Name] – 1.3.6.1.4.1.9477.1.7.5

[mcIpRequester] – 1.3.6.1.4.1.9477.2
[mcTrapInfo] – 1.3.6.1.4.1.9477.3
        [mcGenericTrap] – 1.3.6.1.4.1.9477.3.1
        [mcSpecificTrap] – 1.3.6.1.4.1.9477.3.2
[mcManagerTable] – 1.3.6.1.4.1.9477.4
        [mcManagerIndex] – 1.3.6.1.4.1.9477.4.1.1.ManagerIndex
        [mcManagerIp] – 1.3.6.1.4.1.9477.4.1.2.ManagerIndex

D1000 Switch SNMP Variable Definitions:

[d1000SwitchControl] – 1.3.6.1.4.1.9477.1.7.1
D1000 Switch Control. This variable is used to control the selected channel. When set to A, the switch will connect channel A to C. When set to B, the switch will connect channel B to C.

[d1000KeyStat] – 1.3.6.1.4.1.9477.1.7.2
D1000 Key-Lock Switch Status. This is a read only variable. This variable can be used to determine if the Key-Lock Switch is in the OFF or ON position. Although the standard D1000 does not have a Key-Lock Switch, this feature is supported and could be added on future models.

[d1000PowerStat] – 1.3.6.1.4.1.9477.1.7.3
D1000 Power Status. This is a read only variable. Since the D1000 is powered via a single power supply, the Power Status will report "OneSupply".

[d1000SoftwareVersion] – 1.3.6.1.4.1.9477.1.7.4
D1000 Software Version. This is a read only variable, and is limited to a maximum of 14 characters.

[d1000Name] – 1.3.6.1.4.1.9477.1.7.5
D1000 Identification String. The string is limited to a maximum of 14 characters.

[mcIpRequester] – 1.3.6.1.4.1.9477.2
The IP address of the remote entity that last accessed branch 1.3.6.1.4.1.9477.1. This variable can be used to identify the last IP address to access any mcAgent variable. It is returned in the authenticationFailure message.

[mpTrapInfo] – 1.3.6.1.4.1.9477.3
Group of trap information variables. This variable is not directly accessible.

[mcGenericTrap] – 1.3.6.1.4.1.9477.3.1
Indication of generic trap events. This variable is bit mapped such that bit 0 is trap 0, bit 1 is trap 1, etc. Write an integer with 1 in bit positions to clear particular trap indications. For example write 17 to clear traps 0 & 4.

[mcSpecificTrap] – 1.3.6.1.4.1.9477.3.2
Indication of specific trap events. This variable is bit mapped such that bit 1 is trap 1, bit 2 is trap 2, etc. Write an integer with 1 in bit positions to clear particular trap indications. For example write 18 to clear traps 1 & 4.

[mcManagerTable] – 1.3.6.1.4.1.9477.4
Table for SNMP Manager IP addresses. This variable is not directly accessible.

[mcManagerIndex] – 1.3.6.1.4.1.9477.4.1.1.ManagerIndex
Index used to identify unique entries in the Manager IP address table.

[mcManagerIp] – 1.3.6.1.4.1.9477.4.1.2.ManagerIndex
SNMP Manager IP address. Destination IP address for TRAP or SYSLOG messages.

10. Traps Summary

The D1000 A/B Switch can be configured to issue an SNMP trap when certain events occur. Use the "SET ALERTTYPE" command to enable traps, and use the "SET MANAGER N X.X.X.X" command to specify the IP addresses of up to 16 different NMS computers that you want to send these traps to (see section 7 for details regarding these commands). The following traps are generated by the D1000 A/B Switch. For additional details regarding theses traps, and the SNMP MIB objects supported by the D1000 A/B Switch, please refer to the d1000.mib file supplied with your switch.

generic trap 0   coldStart – issued when the unit is powered up, or after a RESET command
generic trap 4   AuthenticationFailure – issued when an invalid SNMP read/write community name is used when attempting to access the D1000 A/B Switch
specific trap 6   SystemSwitchChange – issued in response to a switching action caused by a user initiated command, front panel push button action, or remote dry contact closure
specific trap 8   AutoSwitchChange – issued when the D1000 automatically changes connection states via the auto-switch function

11. Syslog Messages

The D1000 A/B Switch can be configured to issue a syslog message rather than an SNMP trap when certain events occur. To configure the D1000 A/B Switch to issue syslog messages, you must use the "SET ALERTTYPE" command to select SYSLOG messages, and you need to specify the IP address(es) of the device(s) that will be receiving the syslog messages by using the "SET MANAGER N X.X.X.X" command (see section 7 for details regarding these commands). Once these configuration changes have been made, the D1000 A/B Switch will issue syslog messages for the following types of events:

- power up cold start, or restart using the RESET command
- SNMP authentication failure (access attempted using incorrect read or write community name)
- switching action caused by a user initiated command, front panel push button action, or remote dry contact closure
- auto-switch function

The syslog messages issued by the D1000 A/B Switch conform where possible to the general recommendations as described in RFC 3164. There is no real time clock within the D1000 A/B Switch however, so each syslog message uses a default timestamp value of Jan 1 00:00:00. The device receiving the syslog messages will need to apply a timestamp or other identifier if this information is needed. The general format for each syslog message from the D1000 A/B Switch is as follows:

Jan 1 00:00:00 [IP address] Bypass Switch: [specific message based on the event that occurred]

Listed below is each type of syslog message that the D1000 A/B Switch can issue, followed by the actual syslog message that the D1000 A/B Switch will send.

Syslog Messages

    power up cold start (or RESET command)
    Jan 1 00:00:00 192.168.1.151 Bypass Switch: Switch has been reset.

    SNMP authentication failure
    Jan 1 00:00:00 192.168.1.151 Bypass Switch: SNMP authentication failure.

    system switch A to B via S S B command (or toggle switch)
    Jan 1 00:00:00 192.168.1.151 Bypass Switch: System switch to B position.

    system switch B to A via S S A command (or toggle switch)
    Jan 1 00:00:00 192.168.1.151 Bypass Switch: System switch to A position.

    auto switch B to A via auto-switch function
    Jan 1 00:00:00 192.168.1.151 Bypass Switch: Automatic switch to A position.

    auto switch A to B via auto-switch function
    Jan 1 00:00:00 192.168.1.151 Bypass Switch: Automatic switch to B position.

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