Datatek

DT-2020

Inter-Networking Mediation Interface

For SAM Concentrators

User's Manual

VERSION 1.0.05

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Datatek
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Contents

1 SAFETY INSTRUCTIONS

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

When installing, operating, or maintaining this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

❑ Read and understand all instructions.

❑ Follow all warnings and instructions marked on this product.

❑ For information on proper mounting instructions, consult the User's Manual provided with this product.

❑ This product should only be operated from the type of power source indicated in the User's Manual.

❑ This unit is intended to be powered from either –48 V dc or AC voltage sources. See User's Manual before connecting to the power source.

❑ The –48 V dc input terminals are only provided for installations in Restricted Access Areas locations.

❑ Do not use this product near water, for example, in a wet basement.

❑ Never touch uninsulated wiring or terminals carrying direct current or leave this wiring exposed. Protect and tape wiring and terminals to avoid risk of fire, electric shock, and injury to service personnel.

❑ To reduce the risk of electrical shock, do not disassemble this product. Service should be performed by trained personnel only. Opening or removing covers and/or circuit boards may expose you to dangerous voltages or other risks. Incorrect re-assembly can cause electric shock when the unit is subsequently used.

❑ For a unit intended to be powered from –48 V dc voltage sources, read and understand the following:

   ❑ This equipment must be provided with a readily accessible disconnect device as part of the building installation.

   ❑ Ensure that there is no exposed wire when the input power cables are connected to the unit.

   ❑ Installation must include an independent frame ground drop to building ground. Refer to User's Manual.

This symbol is marked on the Unit, adjacent to the ground (earth) area for the connection of the ground (earth) conductor.

   ❑ This Equipment is to be Installed Only in Restricted Access Areas on Business and Customer Premises Applications in Accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA No. 70. Other Installations Exempt from the Enforcement of the National Electrical Code May Be Engineered According to the Accepted Practices of the Local Telecommunications Utility.

❑ For a unit equipped with an AC Wall Plug-In Unit, read and understand the following:

   ❑ Use only the Sceptre, Model SA-0515A5U-2 or SINO American Electronic, Model SA10-0515U (Globtek, Model TR9KA1500LCP-S) Wall Plug-In Unit shipped with this product.

   ❑ Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

   ❑ Do not staple or otherwise attach the power supply cord to the building surfaces.

   ❑ Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.

❑ The socket outlet shall be installed near the equipment and shall be readily accessible.

❑ The Wall Plug-In unit may be equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug is intended to fit only into a grounding type power outlet. Do not defeat the safety purpose of the grounding type plug.

❑ Do not allow anything to rest on the power cord. Do not locate this product where the cord may be abused by persons walking on it.

❑ Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a) When the powers supply cord or plug is damaged or frayed.

b) If liquid has been spilled into the product.

c) If the product has been exposed to rain or water.

d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by qualified technician to restore the product to normal operation.

e) If the product has been dropped or the cabinet has been damaged.

f) If the product exhibits a distinct change in performance.

SAVE THESE INSTRUCTIONS

2 OVERVIEW

The DT-2020 is a mediation device, which allows for the re-use of SAM concentrator endpoints on an IP infrastructure without any BNS equipment presence. The DT-2020 is an external unit and provides up to 64 ports of service. The DT-2020 may be used with all types of SAM concentrators, supports all of the current SAM port options, and is compatible with the mediation function of the DT-4000[1].

The DT-2020 provides a TELNET over TCP path or a transparent TCP path for each user port on the SAM concentrator. These ports may then connect to an arbitrary IP host without an intermediary interface. While this is normally the case for asynchronous protocols, it is also true of synchronous protocols where the peer host has implemented the framing interface per the appropriate RFCs.
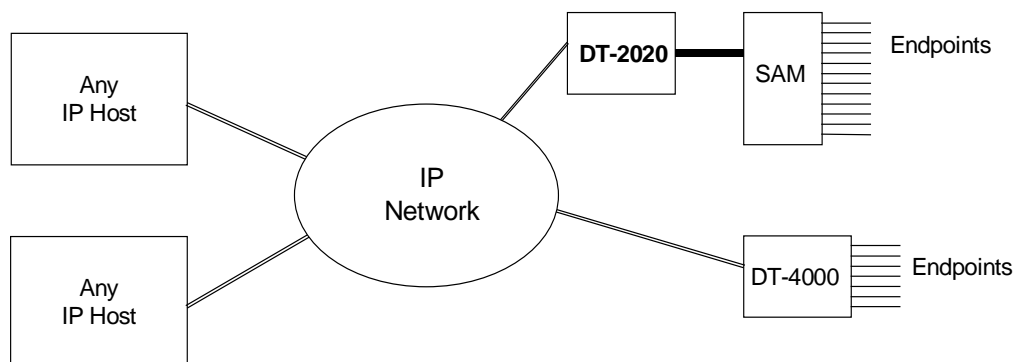
The above configuration is not the only possible one. It depicts some of the networking capabilities of the DT-2020. A port on a DT-2020 connected SAM could be having a session directly with an IP host. A second port on a DT-2020 connected SAM could be having a session directly with a device connected to a DT-4000. A third port could be connected to a fourth port on the same SAM, since local switching is done by the DT-2020.

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[1] The DT-4000 is an inter-networking device, which may exist in BNS and IP, ATM, TDM or Frame Relay networks simultaneously. It acts like a SAM16, but also supports IP inputs and higher port speeds. The DT-4000 communicates via Frame Relay, ATM, TDM or IP across the backbone network, and becomes a stand-alone edge device in non-BNS networks.

The DT-2020 connection to the attached SAM is via a SAM trunk. SAM8/16 concentrators use the DDS protocol, while a SAM64 uses either a SAMSL or Universal Trunk Module[2].

The speed of a trunk between a DT-2020 and SAM is dependent on the SAM type. A SAM8 supports a 56Kbps trunk as does a SAMSL-connected SAM64. A SAM16 supports a 128Kbps trunk. A Universal-Trunk connected SAM could have this link operate up to E1 rate.

The connection to the IP network is via a 10BaseT interface. The network interface is active when the DT-2020 is in-service even if the connected SAM is not in service.

Other protocols, such as SNMP, Telnet, and ARP are supported via the 10BaseT interface as well.

2.1 CLOSED USER GROUPS

The DT-2020 supports the notion of *Closed User Groups* available in BNS networks. This is an important feature for protecting sensitive endpoints in a corporate-wide network without the burden of special "security servers".

Most IP terminal servers provide no protection of any kind with regard to per-port security. Their use in a sensitive environment would require external and expensive "security servers". These external servers are not completely reliable because their protected network segment has multiple entry points. The DT-2020 solves all those issues by implementing a form of *Closed User Groups* for IP networks to provide a similar level of security as in a BNS Network.

2.2 HUNT GROUPS

The DT-2020 supports the notion of *Hunt Groups* available in BNS networks. A Hunt Group is a set of ports that are arranged to receive calls to a common address.

2.3 MNEMONIC HOST NAMES

The DT-2020 can maintain a set of mnemonic host names, analogous to the /etc/hosts file on both UNIX and Microsoft Windows platforms. This allows the DT-2020 to perform a translation between a user provided name and its associated IP address and TCP port number. It is used for non-PDD originating ports. The use of a mnemonic name is optional; the DT-2020 will always accept an IP address in its base form.

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[2] The Universal Trunk is a BNS Module that replaces all existing trunks in the Node, MPC and SAM. It interconnects BNS nodes over Frame Relay, ATM and IP networks.

3 PHYSICAL DESCRIPTION

3.1 DEVICE

Through a DB25 RS530 connector, the DT-2020 supports two software-selectable device interfaces: V.35 and RS-232C. The female connector electrically presents a data communication equipment (DCE) interface.

For V.35, a standard RS-530 to V.35 adapter is available. V.35 is a 34-pin electrical interface.

The DT-2020's DB25 RS530 connector supports RS-232C directly, which in this case is a 25-pin electrical interface.

3.2 10 BASE-T LAN

This interface requires a standard RJ45-terminated Category 5 twisted-pair data cable, which connects to a 10BaseT hub or router on the local LAN segment.

3.3 CONSOLE

This interface requires a standard RJ45-terminated, twisted pair, data cable. It connects as data terminating equipment (DTE) to an asynchronous device and uses RS-232C signaling. Connection to the DT-2020 console is required for any DT-2020 administration or StarKeeper® II NMS alarm collection. Otherwise, the console can be disconnected during normal operation.

The DT-2020 also supports console access through a TCP telnet connection, and makes use of the standard telnet server port (port 23). This service is available only when the unit is in-service.

3.4 RACK-MOUNT PANEL

The DT-2020 rack-mount panel contains twelve slots to accommodate that number of DT-2020 units. Each rack-mount panel fits in a 19 inch or 23 inch EIA standard equipment rack (use extension ears when mounting in a 23-inch rack). The rack-mount panel supports 1 inch, 1.75 inch, and 2 inch spacing between vertical rail mounting holes. Mounting ears for DT-2020 placements in the rack-mount panel are available.

3.5 POWER

Dual power interfaces are present on the DT-2020 faceplate. A circular interface labeled 5V DC mates with the barrel connector of an AC (standard wall outlet) to DC power transformer for 115V/220V AC installations. A three position (accepting return, minus and ground power wires) terminal block labeled 48V DC is commonly used in central office installations.

The DT-2020 is factory configured for 115V/220V AC usage. 48V DC operation requires a different jumper setting on the DT-2020 system board. *(See Installation Section)*

3.5.1 STAND-ALONE AC POWER

For this application, a separate AC power supply is available. The power supply has a six-foot cable that terminates with a barrel connector. The power supply plugs into a standard 115V or 220V AC outlet. The barrel connector plugs into the circular connector labeled 5V AC on the DT-2020 faceplate.

3.5.2 RACK-MOUNT AC POWER

DT-2020 rack-mount AC power is the same as in the stand-alone DT-2020. This configuration requires one AC power supply for each DT-2020 unit. However, it is recommended that your equipment rack be outfitted with sufficient power strips to accommodate all of the AC power supplies.

3.5.3 STAND-ALONE DC POWER

The stand-alone DT-2020 accepts DC power input directly from a 48V DC power source which connects into the three position (accepting return, minus, and ground power wires) terminal block labeled 48V DC on the DT-2020 faceplate. The terminal block connectors accommodate 10 awg to 14 awg (American Wire Gauge) wire. A strain-relief clamp is available separately for DC wire stabilization.

3.5.4 RACK-MOUNT DC POWER

The rack-mounted DT-2020 accepts DC power input directly from a 48V DC power source which connects into one of two main, three position (accepting return, minus, and ground power wires) terminal blocks labeled 48V DC on the rack-mount panel faceplate. Power is distributed to six terminal blocks, vertically below each main terminal block, where each individual terminal block powers a single DT-2020. Twelve DT-2020 units can be powered in this manner.

The terminal block connectors accommodate 10awg to 14awg (American Wire Gauge) wire. A strain-relief clamp is available separately for DC wire stabilization

3.5.5 LED

The DT-2020 faceplate contains light emitting diodes (LEDs) used to report DT-2020 activity and status.

| LED Function	LED Color	LED Description
Transmit (Tx)	Yellow	10 Base-T Transmit Packet Indicator
Receive (Rx)	Yellow	10 Base-T Receive Packet Indicator
Link (LNK)	Green	10 Base-T Link Indicator
Collision (COL)	Red	10 Base-T Collision Indicator
Power (PWR)	Green	Unit Power Indicator

4 INSTALLATION

This chapter contains the steps needed to install and configure the DT-2020.

4.1 EQUIPMENT

Unpack and inspect the DT-2020 units and other components and have on hand a #2 phillips and medium-sized flathead screwdriver.

4.2 POWER CONFIGURATION (STEPS FOR 48V DC OPERATION)

The DT-2020 is factory configured for 115V AC usage. 48V DC operation requires a different jumper setting on the DT-2020 system board.
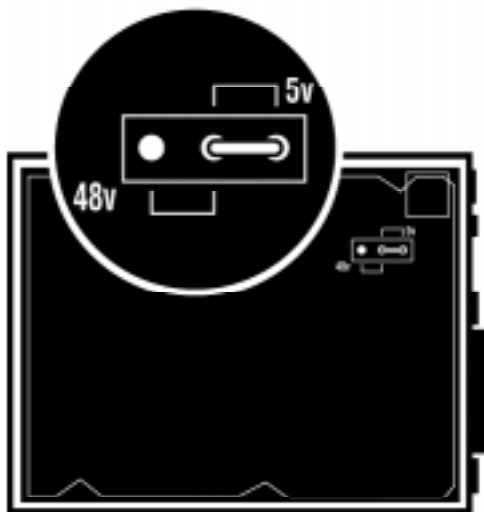
1. **Disconnect any power connectors to the DT-2020.**

2. **Remove the DT-2020 cover exposing the top portion of the system board.**

3. **Locate the jumper connector and move the jumper to the 48V setting *(see adjacent figure).***

4. **Replace the DT-2020 cover.**

5. **The DT-2020 is ready for 48V DC operation**

4.3 STAND-ALONE DT-2020 EQUIPMENT

If a stand-alone DT-2020 unit is being installed, the following items are needed.

❑ One DT-2020 unit.

❑ One power supply for AC operation (DC is directly wired into the unit).

❑ A V.35 or DB25 (RS-232C) cable for connection between the DT-2020 and the SAM. (V.35 requires a DB25 to V.35 adapter to be placed on the SAM or DT-2020)

❑ An RJ45-terminated twisted-pair data (RS-232C) cable for connection between the DT-2020 console port and asynchronous device.

❑ A category 5 RJ45-terminated twisted-pair data cable for connection between the DT-2020 and the local 10BaseT LAN hub or router.

❑ 10BaseT LAN hubs or routers with 10BaseT access to the Intranet or Internet.

❑ For DC operation, a strain-relief clamp for wire stabilization

4.4   RACK-MOUNT DT-2020 EQUIPMENT

When installing DT-2020 units in a rack-mount configuration, it is necessary to gather the items listed above for stand-alone DT-2020 installation, plus the following equipment.

❑ An EIA standard 19-inch or 23-inch equipment rack with internal, vertical mounting rails. Hole spacing on the vertical-mounting rail may be 1 inch, 1.75 inch or 2 inch. Use the dimension specifications in the appendix to calculate how high the rack needs to be to support a specified number of rack-mount panels. *For example, seven rack-mount panels measuring 10.5 inches each will fit in a data equipment rack with internal mounting rails 75 inches in height. This configuration will support a maximum of 84 DT-2020 units.*

❑ A rack-mount panel for each set of twelve DT-2020 units.

❑ A pair of mounting ears for each DT-2020.

❑ Strain relief clamps for DC wire stabilization.

❑ A -48V DC power source for every 12 DT-2020s mounted in a rack.

4.5   STAND-ALONE INSTALLATION

4.5.1   AC ONLY

1. Attach the provided feet to the bottom of the unit.

2. Place the DT-2020 in the desired location, such as a shelf in a data equipment rack.

3. Plug one end of the RJ45-terminated category 5 twisted-pair data cable into the DT-2020 10BaseT LAN interface and the other into a 10BaseT LAN hub or router.

4. Plug one end of the RJ45-terminated twisted-pair data cable into the DT-2020 console interface and the other into the port of the asynchronous device that will be used to configure or manage the DT-2020.

5. Plug one end of the V.35 (requires DB25 to V.35 adapter) or RS232-C device cable into the DT-2020 device interface and the other end into the existing SAM.

6. Plug the power supply into a standard 115V AC outlet and plug the barrel connector from the power supply into the circular connector on the DT-2020 faceplate labeled 5V DC.

4.5.2   DC ONLY

1. Attach the provided feet to the bottom of the unit.

2. Fasten the strain-relief bracket to the side of the DT-2020.

3. Place the DT-2020 in the desired location, such as a shelf in a data equipment rack.

4. Plug one end of the RJ45-terminated category 5 twisted-pair data cable into the DT-2020 10BaseT LAN interface and the other into a 10BaseT LAN hub or router.

5. Plug one end of the RJ45-terminated twisted-pair data cable into the DT-2020 console interface and the other into the port of the asynchronous device that will be used to configure or manage the DT-2020.

6. Plug one end of the V.35 (requires DB25 to V.35 adapter) or RS232-C device cable into the DT-2020 device interface and the other end into the existing SAM.

7. Run your 48V DC (return, minus and ground) wires from a central source through the strain relief clamp for DC wire stabilization. On the DT-2020 faceplate, attach the return, minus and

ground wires to the return, minus and ground connections, respectively, of the terminal block labeled 48V DC.

4.6   RACK-MOUNT INSTALLATION

4.6.1   AC ONLY

1. Prepare each DT-2020 for rack mounting by attaching the mounting ears to each side of the DT-2020.

2. Fasten the twelve-slot rack-mount panel to a 19-inch equipment rack or use extension ears for a 23-inch rack. Slide each DT-2020 with mounting ears into one of the twelve rack-mount panel slots. Secure the DT-2020 to the rack mount panel with screws.

3. For each DT-2020, plug one end of the RJ45-terminated category 5 twisted-pair data cable into the DT-2020 10BaseT LAN interface and the other end into a 10BaseT LAN hub or router.

4. For each DT-2020, plug one end of the RJ45-terminated twisted-pair data cable into the DT-2020 console interface and the other end into the asynchronous device.

5. For each DT-2020, plug one end of the V.35 (requires DB25 to V.35 adapter) or RS232-C device cable into the DT-2020 device interface and the other end into the existing trunk cable or BNS trunk I/O board.

6. Plug the power supply into a standard 115V AC outlet and the barrel connector from the power supply into the circular connector on the DT-2020 faceplate labeled 5V DC.

4.6.2   DC ONLY

1. Prepare each DT-2020 for rack mounting by attaching the mounting ears to each side of the DT-2020.

2. Attach the power distribution panel(s) to the rack-mount plate.

3. Make sure the rack mount panel rocker switches are set to the **OFF** position.

4. To the rack mount panel faceplate, fasten the strain relief clamp(s).

5. Fasten the twelve-slot rack-mount panel to a 19-inch equipment rack or use extension ears for a 23-inch rack. Slide each DT-2020 with mounting ears into one of the twelve rack-mount panel slots. Secure the DT-2020 to the rack mount panel with screws.

6. For each DT-2020, plug one end of the RJ45-terminated category 5 twisted-pair data cable into the DT-2020 10BaseT LAN interface and the other end into a 10BaseT LAN hub or router.

7. For each DT-2020, plug one end of the RJ45-terminated twisted-pair data cable into the DT-2020 console interface and the other end into the asynchronous device.

8. For each DT-2020, plug one end of the V.35 (requires DB25 to V.35 adapter) or RS232-C device cable into the DT-2020 device interface and the other end into the existing SAM.

9. Run the 48V DC (return, minus and ground) wires from a central source through the strain relief clamp used for DC wire stabilization. On the rack mount panel, attach the return, minus and ground wires to the return, minus and ground connections to one of the main terminal blocks labeled 48 Vin. Power is distributed to six terminal blocks vertically below the main terminal block and labeled 48 Vout. Each individual 48-Vout terminal block below the main 48 Vin terminal block powers a single DT-2020. This is accomplished by jumping short return, minus and ground wires between the panel terminal block and the DT-2020 terminal block.

All terminal block connectors accommodate 10 awg to 14 awg wire. Strain relief clamps are used for DC wire stabilization.

10. Make sure the rack mount panel rocker switches are set to the **ON** position.

5 CABLING

This section provides information on cabling the DT-2020 console and data ports. Consult the following table for ordering information regarding all of the cabling options shown in this section.

Depending upon access availability, some of the following cables will be needed to setup DT-2020 console and data ports.

Cable / Adapter	Description
258B adapter	50-pin M to 6 8-pin mod
CS25AS-MOD	50-pin 180-M to 34-pin V.35
V.35 to RS-232 adapter	Male 34 pin V.35 to Female DB25
V.35 to RS-232 adapter	Female 34 pin V.35 to Male DB25
Mod – DB9 adapter	8-pin mod to DB9 M
D8AH-M adapter	25-pin M to mod socket
D8AH-F adapter	25-pin F to mod socket
D8AG-M adapter	25-pin M to mod socket
D8AG-F adapter	25-pin F to mod socket
Console (special wiring)	8-pin mod to 8-pin mod
Straight mod cable	8-pin mod to 8-pin mod
CAT5 cable	8-pin mod to 8-pin mod (shielded)

*Note: Use an AG adapter to talk to a terminal and an AH adapter to talk to a modem.*

The AH adapter will be used to terminate the cable, and will be attached to the appropriate device. The attached device will determine the gender of the AH adapter.

5.1   CONSOLE CABLING

The DT-2020 is managed through the console port by a terminal, PC, dial-up modem, or BNS asynchronous connection. Network administrators can access the console port through the StarKeeper® II NMS.

Console cables are available and are required for console connection to TY12 and MSM modules, SAM64/504 Multiplexors, and connection through an Ortronics distribution patch panel *(see figure)*.
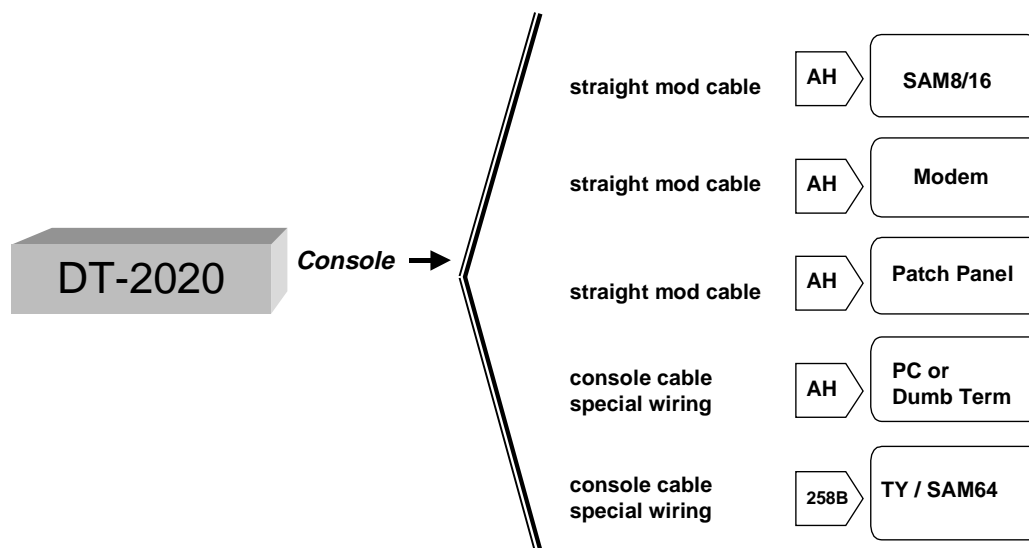
Specific instructions for configuration of SAM, TY12 and MSM asynchronous ports are available in the appropriate BNS-2000 module reference guide. DT-2020-specific configuration requirements are described herein.

- Configure SAM, TY12 and MSM console connections as 9600 bps with 8 bits and no parity, and use a DCE type cable.

- Configure SAM and MSM console connections as type "host" and as a "pap" (permanently active port).

- Configure TY12 console connections as type "console".

5.2 DT-2020 DATA (10 BASE-T LAN)

A Shielded Twisted-Pair CAT5 cable is attached to the 10 Base-T LAN port of the DT-2020. This allows for cabling into either a 10BaseT hub or router.
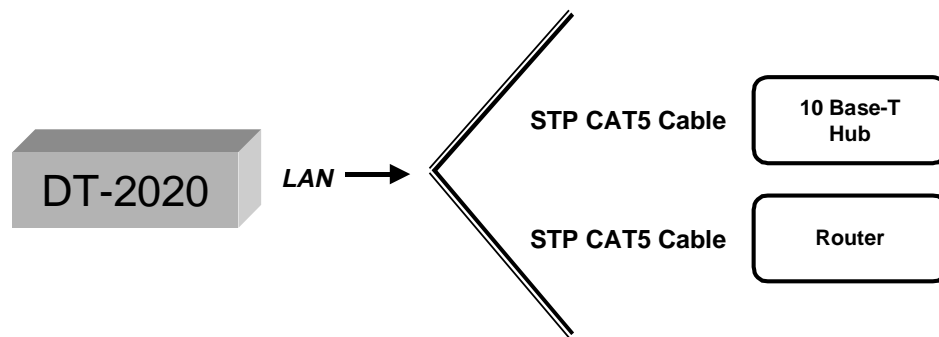
5.3   DT-2020 SAM SETUP

The DT-2020 is easily configured. The first step involves giving it an IP address, a Gateway Router IP address (if required), an SNMP trap manager address (optional), and the trunk speed.

Refer to the command section for additional information

```
login passwd=initial

local ipaddr=135.17.59.206 submask=255.255.255.0

gateway ipaddr=135.17.59.1

trunk phy=v35 speed=56k

rs SAM mod

rs dt2020
```

Note: *In the initial configuration above, the SAM type did not need to be entered. This is because the DT-2020 will determine the attached SAM type automatically.*

Suppose port 1 of the SAM is to be a port which can originate a call. It is attached to a device at 9600 baud, asynchronous, 8 bits, no parity, with a "double break" disconnect.

The configuration of these attributes is as follows:

```
port 1 type=orig prot=async baud=9600 attn=2brk

rs SAM port 1
```

Note:

In this sample configuration, other options were left at their default values.

Suppose port 2 is to be a port which can receive a call. It too is attached to a device at 9600 baud, asynchronous, 8 bits, and no parity. The call is to be received on a hunt group TCP port 51000.

The configuration sequence is as follows:

```
port 2 type=rcv prot=async baud=9600 hport=51000

rs SAM p 2
```

Now suppose that port 10 is to be added to the hunt group along with port 2; same attributes.

```
port 10 type=rcv prot=async baud=9600 hport=51000

rs SAM p 10
```

Other options, such as making the port "Permanently Active", synchronous options, closed user group assignments, flow control, etc. are assigned by using their tag format as specified in the commands section.

6 COMMANDS

6.1 MODULE-LEVEL COMMANDS

The module-level commands are listed below. Not all commands are visible all the time. Should the unit be *logged out*, only the **login** command would be visible. A reboot places the unit in the *logged out* mode. The OA&M port is *StarKeeper Compatible* for future integration.

6.1.1 LOGIN

Syntax: login passwd=<password> (default password is: initial)

The **login** command is a security command required for accessing the bulk of the Module command set. It is only available when the user is logged off. The password must contain between one and seven alphanumeric characters. The typed password is case insensitive and is not echo-suppressed. Special characters are not allowed.

6.1.2 LOGOUT

Syntax: logout

The **logout** command returns the DT-2020 to its logged-out mode, thus preventing unauthorized access.

6.1.3 CHANGE PASSWORD

Syntax: chgpass old=<password> new=<password> confirm=<password>

The **chgpass** command allows the user to change a previously configured password. The old password is the one currently in effect. The new and confirm passwords should be identical. The password must contain between one and seven alphanumeric characters and is case insensitive. Special characters are not allowed. All arguments are required to complete the command.

6.1.4 LOCAL

Syntax: local mac=<MAC addr> ipaddr=<IP address> submask=<submask>

The **local** or **lo** command sets the IP address of the DT-2020 to facilitate IP communication.

The **MAC** address is a fixed attribute for each unit that should be set only to the value specified at the factory. However, in cases where a spare unit is replacing a failed DT-2020, configuring the replacement unit with the same MAC address as the failed unit will eliminate the need for address resolution.

The **ipaddr** is the IP address of this unit. The **submask** is the subnet mask of this unit with a default value of 8 bits (255.255.255.0). The IP address and subnet mask are used by the unit to determine whether the IP address of an outgoing packet is on the same LAN segment, or if a gateway hop is required.

6.1.5 GATEWAY

Syntax: gateway ipaddr=<IP address>

The **gateway** or **ga** command identifies the IP address of the local gateway router, if any. If the remote device resides on a different LAN, the gateway is the first hop the data travels through to reach the remote device.

The **ipaddr** is the IP address of the gateway router to be used when a packet's destination IP address is on a different LAN segment.

6.1.6 HELP

Syntax: help

The **help** or **?** command without arguments displays the entire DT-2020 command set and command syntax for the mode (logged out or logged in) the unit is currently in. Individual command syntax is available when the help command is followed by the command name.

6.1.7 VERSION

Syntax: ver

The **version** or **ver** command displays the current software and database revisions of the unit and is only visible when the user is logged in. The command has no arguments.

6.1.8 REBOOT

Syntax: reboot

The **reboot** command resets the unit, which allows physical attributes to be set. The command has no arguments, and is only visible when the unit is logged in. After reboot, the OA&M interface returns to the logged-out mode.

6.1.9 REMOVE DT-2020 MODULE

Syntax: remove dt2020

The **remove dt2020** command is only visible when the unit is *logged in*. The command has no additional arguments. The command takes the unit out of service. This command must be performed before any module-level configuration changes can occur.

6.1.10 REMOVE SAM MODULE

Syntax: remove SAM MOD

The **remove SAM MOD** command is only visible when the unit is *logged in*. The command has no additional arguments. The command takes the SAM out of service.

6.1.11 RESTORE DT-2020 MODULE

Syntax: restore dt2020

The **restore dt2020** command is only visible when the unit is *logged in*. The command has no additional arguments. It returns the unit to service. If any physical attribute was changed on the unit, including the MAC address, the unit will be automatically rebooted by this command.

6.1.12 RESTORE SAM MODULE

Syntax: restore SAM MOD

The **restore SAM MOD** command is only visible when the unit is *logged in*. The command has no additional arguments. It returns the SAM to service.

6.1.13 CLEAR

Syntax: clr

The **clear** command is only visible when the unit is *logged in*. There are no arguments. It sets all the measurements and error counters to zero.

6.1.14 DT-2020 MODULE DISPLAY MEASUREMENTS

Syntax: dmeas dt2020

The **dmeas (dm) dt2020** command displays the current measurements for the unit and is only visible when the user is logged in. The command has no arguments.

The report displays Packet, Frame, Error and Ethernet counters plus specific per-protocol counters. Refer to the Measurements section.

6.1.15   SAM MODULE DISPLAY MEASUREMENTS

Syntax: dmeas SAM MOD

The **dmeas SAM MOD** command displays the current measurements for the SAM and is only visible when the DT-2020 is logged in. The command has no arguments.

The report displays counts of DDS packets sent to/from the SAM, as well as protocol errors in each direction.

6.1.16   VERIFY DT-2020 MODULE

Syntax: vfy dt2020

The **vfy dt2020** command is only visible when the unit is *logged in*. The command displays the DT-2020 configuration in a formatted report on the console.

6.1.17   VERIFY SAM MODULE

Syntax: vfy SAM MOD

The **vfy SAM MOD** command is only visible when the unit is *logged in*. The command displays the SAM configuration and service state in a formatted report on the console.

6.1.18   HOST NAME ADMINISTRATION

Syntax: host <host #>   [name=<host name>]
**   [ipaddr=<IP address>]**
**   [port=<TCP port>]**
**   [del]**

The DT-2020 supports mnemonic destination name translation for non-PDD originating user ports. These mnemonic names are translated into an IP address and TCP port during call setup. The **host** command is used to configure the translation table.

The **name** field is a mnemonic for a destination up to nine characters in length. The **ipaddr** (of the host) and TCP **port** (on the host) parameters specify the translation to be performed during call setup. If the parameter **del** is used, the entry is deleted.

6.1.19   VERIFY HOST

Syntax: vfy host

This command is only visible when the unit is logged in. It displays host-address configuration in a formatted report on the console.

6.1.20   SNMP

Syntax: snmp ipaddr=<Trap mgr addr> port=<Trap mgr port>

This command is used to configure the IP address of the SNMP trap manager. Since traps are unsolicited alarms, an agent can take the initiative to inform the manager of the occurrence of a predefined condition. Typical conditions include the cold-start or warm-start of equipment and a link-down or link-up condition.

A single and multiple SNMP managers can access the DT-2020. However, only one SNMP manager can be predefined as the trap manager. By administering this command, all traps will be

directed to the chosen trap manager. The port number should be configured for 162 on new configurations, which is standard practice.

The **ipaddr** field defines the IP address of the SNMP manager to whom the TRAPs are to be sent.

The **port** indicates the UDP port on that SNMP manager and defaults to the standard value of 162.

6.1.21   CONSOLE TIMEOUT

Syntax: timeout [OFF | <number of seconds>]

The DT-2020 console uses a three-wire interface (RD, TD, GND), and the lead state of other signals is not relevant. This would imply that the only way to change the state of the console is to explicitly log in or log out, or via a reboot or reset, which forces the console to be logged out.

For users who wish the console to automatically log off after a period of inactivity, there is a console timer. The console timer defaults to the disabled condition, and may be activated by the **timeout** command. This command is only visible when the console is logged in. The **<number of seconds>** value must be between 15 and 255, inclusive. When the DT-2020 determines a period of inactivity of the specified time, it automatically forces the console to log off. An INFO-level alarm (see sec. 8) is issued at that time.

6.1.22   INSTALL SOFTWARE

Syntax: install [key=<registration key>]

The DT-2020 is shipped with the software pre-registered for the installed software. A registration procedure must be performed after each upgrade to a new software release.

The **install** command is used to register the DT-2020 software. The command is available at all times, since registration is required for a console login. When this command is used with no argument, it provides the data needed to generate the registration key. The same command is then used with the **key** value to register the software. The registration is performed after the new software is made active with a module **reboot** command.

6.2   SAM INTERFACE COMMANDS

The SAM Interface commands are used to configure the connectivity to the attached SAM device. Support is provided for DDS format direct serial trunks.

6.2.1   TRUNK

**Syntax: trunk [phy=<v35|232>] [type=<DDS>] speed=<speed>]
[enc=<NRZ|INRZ|NRZI|INRZI>]**

The **trunk** (or **trk**) command configures the serial-trunk interface to the SAM. The **phy** is configured to match the physical interface of the SAM. Currently, the only **type** allowed is "DDS", which implies a SAMSL trunk in a SAM64 (or a SAM8 or SAM16). The **speed** is configured for the desired trunk speed, and can take on values of "t1", "768k", "512k", "256k", "128k", "56k", "19200", "38400", or "9600". The RS232 interface may be used up to 56K, and the V.35 interface to T1 speed. The type of attached SAM places a speed restriction on the trunk as well. The SAM8 will support 56K trunks. The SAM16 will support 128K trunks. The SAM64/504 will support a 56K trunk if equipped with a SAMSL, or T1 if equipped with a Universal Trunk. The **enc** allows setting the physical encoding. "NRZ" is "no return to zero" and is the standard encoding. "INRZ" is an inverted version. "NRZI" is a different encoding scheme with the similar name of "non return to zero inverted", and "INRZI" is the inverted version of that encoding. The default is "NRZ".

6.3 USER PORT COMMANDS

The User Port interface commands are used to configure the operation of the individual RS-232 ports on the DT-2020 attached SAM. Their operation may be changed by commands in this section.

6.3.1 PORT COMMAND

```
Syntax: port <PortNum>[type=<ORIG|RCV>]
                      [dest=<ipaddr>]
                      [dport=<Dest tcp_port>]
                      [hport=<Hunt Group tcp_port>]
                      [prot=<protocol>]
                      [dxe=<DCE|DTE>]
                      [baud=<baud_rate>]
                      [enc=<NRZ|NRZI>]
                      [ccar=<ON|OFF>]
                      [fill=<MARK|SPACE>]
                      [dbits=<5|6|7|8>]
                      [pap=<ON|OFF>]
                      [parity=<EVEN|ODD|NONE>]
                      [stop=<1|1.5|2>]
                      [attn=<1BRK|2BRK|NONE|char>]
                      [flow=<XON|HW|NONE>]
                      [cug=<+|-><CUG_Num>]
                      [crfix=<TRANS|NONULL>]
```

This command configures an individual user port on the attached SAM.

The **<PortNum>** is a number in the range from 1 to 64, inclusive, corresponding to the RS-232C end-user port being configured.

A port either waits for an incoming call (**type=RCV**), or is an originator of a call (**type=ORIG**). The (optional) PDD for an **ORIG-type** port is defined by **dest=<ipaddr>** and **dport=< Dest tcp_port>**. A caller on an originating port without PDD information configured will be presented a user interface for "dialing".

When a port is a call receiver *(listener)*, it is assigned a default port number value of 50,000 + SAM port number. The port may then be individually addressed at that address. However, when a specific TCP port is specified via the **hport=<Hunt Group tcp_port>** option, it is used in lieu of the default value. Multiple ports may share the same TCP port value. This is used to define a hunt group of ports. A connection that is directed to this TCP port value would select the next available physical port. The **hport** option may only be used with call receiver ports.

The **prot=<protocol>** option defines the protocol used by the port. It may take on the values of **Raw, Async, HDLC, SDLC, EBSC** (EBCDIC BiSync), **ABSC** (Ascii BiSync)**, UNI** (Uniscope BiSync), **ALC** (ALC BiSync)**, DDCMP**, or **VIP** (VIP 7600 BiSync). The **Raw** protocol is asynchronous without the benefit of Telnet encapsulation. It is used for direct TCP connections to the user ports. Contact your sales representative with any other protocol requests.

The **dxe=< DCE | DTE >** option specifies the clocking and signaling mode of the port.

When the protocol is asynchronous, a **dxe** value of **DCE** implies that the port is operating as a modem device. It will assert CTS when presented with RTS. A value of **DTE** for the asynchronous protocol implies that the port is operating as a 2-wire DTE. When there is data available to send,

it shall assert RTS and wait for CTS before sending the data. Please note that a four-wire DTE interface should be configured as **DCE** even though it uses a DTE asynchronous connector.

When the protocol is synchronous *(e.g. SDLC)*, a **dxe** value of **DCE** implies that the port should generate the clock signals. This would require the standard synchronous DCE cable adapter. A **dxe** value of **DTE** implies that the port should accept the clock signals presented. This would require the standard synchronous DTE cable adapter.

When the protocol uses a recovered clock instead of a separate clock *lead (e.g. SDLC NRZI two wire)*, the **dxe** value operates like the asynchronous protocol described above, since external clocking is not necessary. The appropriate asynchronous adapters should be used.

The **enc=<NRZ|NRZI>** option specifies the physical encoding of the line. The default is Non-Return to Zero *(NRZ)*.

The **ccar=<ON|OFF>** field defines constant carrier. This is an option in which the CD *(or DTR if the port is a DTE)* EIA signal is maintained asserted regardless of call status.

The **pap=<ON|OFF>** field defines a permanently active port. Setting this flag on means that the port is ready to communicate regardless of its DTR *(or DCD if the port is a DTE)* EIA signal.

The **fill=<MARK|SPACE>** option indicates what kind of line fill should be applied between frames in the **HDLC**, or **SDLC** protocols.

The **baud=<baud_rate>** determines the speed of the line. It is not required for synchronous DTE ports since the clocking is derived from the line. For asynchronous ports, the allowed values are 75, 110, 150, 300, 1200, 1800, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 48000, 57600, or 115200. For synchronous DCE ports, the same rates apply up to and including 57600 (56K) baud.

The **dbits=<5|6|7|8>** option specifies the number of data bits in an asynchronous port word. It excludes start, stop, and parity bits.

The **parity=<EVEN|ODD|NONE>** option specifies the parity of an asynchronous port word.

The **stop=<1|1.5|2>** option determines the number of stop bits for asynchronous ports.

The **attn=<1BRK|2BRK|NONE|char>** sets the attention character. This is a character that when typed will interrupt the call to a local session. The **1BRK** option specifies a single break. The **2BRK** option specifies two breaks within a short period. The **NONE** option specifies that no attention character is defined. Finally, any ASCII character may be used as the attention. It should be entered in decimal ASCII representation.

The **flow=<XON|HW|NONE>** option determines the flow control for the port. The **XON** option uses XON/XOFF in-band flow control characters. The **HW** option uses the CTS and RTS leads for flow control. Finally, indicating **NONE** may disable flow control.

The **cug=<+|-><CUG_num>** option allows the inclusion or deletion of a Closed User Group in the list of CUGs assigned to the user port. The "**+**" will add the **<CUG_num>** to the CUG list. The "**-**" is used to delete the **<CUG_num>** from the list.

The **crfix=< TRANS | NONULL >** option accommodates an anomaly in some early variants of telnet implementation on UNIX systems, which insert a NULL character in the data stream after a carriage return. Most end devices are not affected by this NULL character. However, some devices (e.g. the BNS control computer) have erroneous operation if these characters are received. The value **TRANS** indicates transparent operation, where all data received by the DT-2020, including a NULL after a carriage return, is forwarded to the end device. The value of **NONULL** removes a NULL character immediately following a carriage return. No other NULL

characters are affected. The default operation is transparent, and the **crfix** option may only be specified if the protocol selected is asynchronous.

6.3.2   REMOVE SAM PORT

Syntax: remove SAM port <PortNum>

The **remove sam port** command is only visible when the unit is *logged in*. **<PortNum>** may be a number in the range one through sixty-four (64) and corresponds with a physical RS-232 port on the attached SAM. The command takes the port "Out of Service". This command must be performed before any port level configuration changes can occur.

6.3.3   RESTORE SAM PORT

Syntax: restore SAM port <PortNum>

The **restore sam port** command is only visible when the unit is *logged in*. **<PortNum>** may be a number in the range of one through sixty-four (64) and corresponds with a physical RS-232 port on the attached SAM. The command returns the port to service.

6.3.4   ADMINISTER CLOSED USER GROUP (CUG)

Syntax: cug <CUG_Num> [ipaddr=<IP address>][mask=<IP submask>]

The **cug** command is only visible when the unit is logged in. The **<CUG_num>** parameter is the closed user group identifier used to assign the CUG to a user port (with the **port** command), and may be a value between 1 and 8, inclusive.

A single IP address and subnet mask pair specifies each CUG. The **ipaddr** parameter is an address of an endpoint (or base address of a group of endpoints) to be allowed into the group. The **ipaddr** value *ANDed* with the **submask** value must agree with the caller's or destination's IP address *ANDed* with the same **submask** for a call to be allowed to or from a user port to which the CUG is assigned. Depending on the **submask** value, this allows an individual (submask=255.255.255.255), intermediate, or network-wide level of authorization.

Setting the **ipaddr** value to 0.0.0.0 deletes any prior configuration for the **<CUG_num>**. A **<CUG_num>** may not be deleted if it is currently assigned to any user port.

A list of all configured CUGs is reported via the **vfy cug** command. The list of closed user groups associated with a given user port is presented in response to the **vfy SAM port** command.

6.3.5   DISPLAY PORT MEASUREMENTS

Syntax: dmeas SAM port <Port_num>

The **dmeas** command is only visible when the unit is *logged in*. It displays the current port-level measurements for the specified RS-232 port **<Port_num>** in a formatted report on the console. The value of **<Port_num>** is between one and sixty-four (64) inclusive.

6.3.6   VERIFY SAM PORT CONFIGURATION

Syntax: vfy SAM port <Port_Num>

The **verify** command is only visible when the unit is *logged in*. The command displays the configuration of the port number specified. The range of **<Port_Num>** is between one and sixty-four (64) inclusive.

6.3.7   VERIFY CLOSED USER GROUP

Syntax: vfy cug

The **verify** command is only visible when the unit is *logged in*. The command displays the configuration of the *Closed User Groups*.

6.3.8   DISPLAY CONNECTIONS

Syntax: dconn

The **dconn** command is only visible when the unit is *logged in*. The command displays the connections between the user ports and their destinations. Only the user ports which are "talking" are displayed. The command takes no arguments.

6.3.9   DIAGNOSE PORT

Syntax: diag port <port_num> <INT | EXT | ALL>

The **diag** command is only visible when the unit is *logged in*. The command accepts arguments to specify a port on which to perform diagnostics. Two types of diagnostics are available. An internal port diagnostic checks the operation of the hardware exclusive of the cabling, connectors, and drivers. The external port diagnostic checks the operation of everything including the attached cable. The **<port_num>** is the RS-232 user port in the range of one through 64, inclusive. The port <u>must</u> be out of service to diagnose. The type of diagnostic is either **INT** for the internal tests, **EXT** for the external tests, or **ALL** for both the internal and external tests.

6.3.10   DISCONNECT PORT

Syntax: disc SAM PORT <Port_num>

The **disc** command is only visible when the unit is *logged in*. If the port is 'in service'; any existing circuit established to the port will be dropped. This is useful in IP networks when the remote peer vanishes due to a remote reboot or a network error. It is essentially equivalent to the "remove/restore" command sequence. The value of **<Port_num>** is between one and the number of actual ports on the attached SAM.

7 SNMP

The DT-2020 SNMP V1 agent supports a multitude of SNMP MIB variables, trap, set, and get operations.

7.1 SNMP VERSION 1 COMMANDS

Command	Operational Result
Get	Requests the values of one or more Management Information Base (MIB) variables.
GetNext	Enables MIB variables to be read sequentially, one variable at a time.
Set	Permits one or more MIB values to be updated.
GetResponse	Used to respond to a Get, GetNext, or Set.
Trap	Indicates the occurrence of a predefined condition.

7.2 DT-2020 SNMP MIB VARIABLE DATABASE

RO = Read Only Variable

R/W = Read Variable / Write Variable

SIV = Storage is Volatile

MIB Variable Number	Name	MIB	Console Equivalent	Access	Notes
1.3.6.1.2.1.1.1.0	SysDescr	MIB-II	Banner Message	RO	
1.3.6.1.2.1.1.2.0	SysObjectID	MIB-II	None	RO	
1.3.6.1.2.1.1.3.0	SysUpTime	MIB-II	None	RO	
1.3.6.1.2.1.1.4.0	SysContact	MIB-II	None	R/W	SIV
1.3.6.1.2.1.1.5.0	SysName	MIB-II	None	R/W	SIV
1.3.6.1.2.1.1.6.0	SysLocation	MIB-II	None	R/W	SIV
1.3.6.1.2.1.1.7.0	SysServices	MIB-II	None	RO	
1.3.6.1.2.1.4.1.0	IpForwarding	MIB-II	None	RO	
1.3.6.1.2.1.4.2.0	IpDefaultTTL	MIB-II	None	RO	
1.3.6.1.2.1.4.3.0	IpInReceives	MIB-II	Number of Ethernet Pkts Rcvd	RO	
1.3.6.1.2.1.4.4.0	IpInHdrErrors	MIB-II	Nbr of Packets w/Header Errs	RO	
1.3.6.1.2.1.4.5.0	IpInAddrErrors	MIB-II	Nbr Rx Packets w/Wrong Addr	RO	
1.3.6.1.2.1.4.6.0	IpForwDatagrams	MIB-II	None	RO	
1.3.6.1.2.1.4.7.0	IpInUnknownProtos	MIB-II	Nbr of Packets w/Unk Protocol	RO	
1.3.6.1.2.1.4.8.0	IpInDiscards	MIB-II	Nbr of Packets Disc due to Resource	RO	
1.3.6.1.2.1.4.9.0	IpInDelivers	MIB-II	Inferred from DMEAS counters	RO	
1.3.6.1.2.1.4.10.0	IpOutRequests	MIB-II	Number of Device Frames Transmitted	RO	
1.3.6.1.2.1.4.11.0	IpOutDiscards	MIB-II	Nbr of Port frames Disc due to	RO	

			Resource		
1.3.6.1.2.1.4.12.0	IpOutNoRoutes	MIB-II	None	RO	
1.3.6.1.2.1.4.13.0	IpReasmTimeout	MIB-II	None	RO	
1.3.6.1.2.1.4.14.0	IpReasmReqds	MIB-II	None	RO	
1.3.6.1.2.1.4.15.0	IpReasmOKs	MIB-II	None	RO	
1.3.6.1.2.1.4.16.0	IpReasmFails	MIB-II	None	RO	
1.3.6.1.2.1.4.17.0	IpFragOKs	MIB-II	None	RO	
1.3.6.1.2.1.4.18.0	IpFragFails	MIB-II	None	RO	
1.3.6.1.2.1.4.19.0	IpFragCreates	MIB-II	None	RO	
1.3.6.1.2.1.4.21.0	IpRoutingDiscards	MIB-II	None	RO	
1.3.6.1.2.1.5.1.0	IcmpInMsgs	MIB-II	None	RO	
1.3.6.1.2.1.5.2.0	IcmpInErrors	MIB-II	ICMP Errors	RO	
1.3.6.1.2.1.5.3.0	IcmpInDestUnreach	MIB-II	None	RO	
1.3.6.1.2.1.5.8.0	IcmpInEchos	MIB-II	Nbr of Pings	RO	
1.3.6.1.2.1.5.9.0	IcmpInEchoReps	MIB-II	None	RO	
1.3.6.1.2.1.6.1.0	TcpRtoAlgorithm	MIB-II	None	RO	
1.3.6.1.2.1.6.2.0	TcpRtoMin	MIB-II	None	RO	
1.3.6.1.2.1.6.3.0	TcpRtoMax	MIB-II	None	RO	
1.3.6.1.2.1.6.4.0	TcpMaxConn	MIB-II	None	RO	
1.3.6.1.2.1.6.5.0	TcpActiveOpens	MIB-II	None	RO	
1.3.6.1.2.1.6.6.0	TcpPassiveOpens	MIB-II	None	RO	
1.3.6.1.2.1.6.7.0	TcpAttemptFails	MIB-II	None	RO	
1.3.6.1.2.1.6.8.0	TcpEstabResets	MIB-II	None	RO	
1.3.6.1.2.1.6.9.0	TcpCurrEstab	MIB-II	None	RO	
1.3.6.1.2.1.6.10.0	TcpInSegs	MIB-II	None	RO	
1.3.6.1.2.1.6.11.0	TcpOutSegs	MIB-II	None	RO	
1.3.6.1.2.1.6.12.0	TcpRetransSegs	MIB-II	None	RO	
1.3.6.1.2.1.6.13.X	TcpConnTable Entries	MIB-II	None	RO	
1.3.6.1.2.1.6.14.0	TcpInErrs	MIB-II	None	RO	
1.3.6.1.2.1.6.15.0	TcpOutRsts	MIB-II	None	RO	
1.3.6.1.2.1.7.1.0	UdpInDatagrams	MIB-II	Derived from other Counts.	RO	
1.3.6.1.2.1.7.2.0	UdpNoPorts	MIB-II	Non-Peer and Spurious UDP errors	RO	
1.3.6.1.2.1.7.3.0	UdpInErrors	MIB-II	Frame Errors	RO	
1.3.6.1.2.1.7.4.0	UdpOutDatagrams	MIB-II	Frames Sent, Keep Alive Messages sent, etc.	RO	
1.3.6.1.2.1.7.5.X	udpEntry Table	MIB-II	None	RO	

1.3.6.1.2.1.11.1.0	SnmpInPkts	MIB-II	None	RO	
1.3.6.1.2.1.11.3.0	SnmpInBadVersions	MIB-II	None	RO	
1.3.6.1.2.1.11.4.0	SnmpInBadCommunity Names	MIB-II	None	RO	
1.3.6.1.2.1.11.5.0	SnmpInBadCommunity Uses	MIB-II	None	RO	
1.3.6.1.2.1.11.6.0	SnmpInASNParseErrs	MIB-II	None	RO	
1.3.6.1.2.1.11.30.0	SnmpEnableAuthenTra ps	MIB-II	None	R/W	SIV
1.3.6.1.2.1.11.31.0	SnmpSilentDrops	MIB-II	None	RO	
1.3.6.1.2.1.11.32.0	SnmpProxyDrops	MIB-II	None	RO	

7.3   SUPPORTED TRAPS

Alarm Text	Severity	Trap Type	Notes
None	N/A	ColdStart	Generated when the unit starts up
None	N/A	AuthFail	SNMP Authorization Failure

8 ALARMS

The following table reflects new alarm types generated by the DT-2020. Alarms are visible at the console and by StarKeeper® II NMS.

Alarm	Severity
Tx Error on 10BaseT. Check Physical Connection.	MAJOR
User Requested Reboot in Progress	INFO
Invalid Login Attempt.	MINOR
Invalid Password Change Attempt.	MINOR
*** TERM32 in SAM Slot #X Inserted. ***	MINOR
*** TERM32 in SAM Slot #X Removed. ***	MINOR
** SAM504 detected – supported only as a SAM64 **	MINOR
*** Unsupported SAM attached. Cannot restore ***	MINOR
Connectivity to SAMx has failed.	MINOR
---> SAM Download Complete. <---	INFO
Port XXX received a call from XXX.XXX.XXX.XXX outside CUG list.	MINOR
Installation Attempt Failed.	MINOR
Console session inactivity timeout.	INFO
Port XXX call disconnected. Half Open TCP error.	INFO

8.1 MAJOR ALARMS

A major alarm indicates a serious, service-degrading condition.

8.2 MINOR ALARMS

A minor alarm indicates a secondary or transient error that is not likely to affect overall service unless multiple minor alarms are issued, in which case a serious condition exists that may affect overall system performance

8.3 INFO ALARMS

An information alarm is a message that does not necessarily require attention. It typically is important for network administration, but does not adversely affect service.

9 FIELD SOFTWARE UPGRADE

A field software upgrade of the DT-2020 is a two-step process, consisting of a software download to the module memory followed by a restart of the unit to activate the new software. The download can be accomplished through two different I/O interfaces emanating from the DT-2020: Telnet or RS-232C.

Specific upgrade instructions are made available with any upgrade release of the software.

9.1   TELNET CONSOLE UPGRADE

Using an industry-standard Telnet application, you can download to the DT-2020. Following the download, a module reboot activates the new software without affecting established calls.

9.2   RS-232C CONSOLE UPGRADE

The DT-2020 may also be upgraded through its RS-232C console port. This is done either remotely from a StarKeeper® II NMS, or locally from a PC. When upgrading via RS-232C, the module needs to be taken *out of service* for the software download portion of the upgrade. Following the download, a module reboot activates the new software.

10 MEASUREMENTS

The following table lists the measurements available using the *display measurements* (**dm**) command. The base measurements are always displayed, while the error and exception counters are only displayed if nonzero.

Interface	Type	Object	Description
10BaseT	Base	DT2020	Number of 10BaseT Packets Received
10BaseT	Base	DT2020	Number of 10BaseT Packets Transmitted.
V.35, RS-232	Base	DT2020	Number of SAMx Frames Received.
V.35, RS-232	Base	DT2020	Number of SAMx Frames Transmitted.
10BaseT	Except	DT2020	Number of ICMP Echo Requests Received.
10BaseT	Except	DT2020	Number of ARP Requests Received (total).
10BaseT	Error	DT2020	Number of Ethernet Discards (Resource).
V.35, RS-232	Error	DT2020	Number of Port Discards (Resource).
10BaseT	Error	DT2020	Number of Late Collisions (TX).
10BaseT	Error	DT2020	Number of Under-run. (TX).
10BaseT	Error	DT2020	Number of packets that exceeded the Retry Limit (TX).
10BaseT	Error	DT2020	Number of Carrier Sense Lost (TX).
10BaseT	Error	DT2020	Number of Frame Collisions (RX).
10BaseT	Error	DT2020	Number of Receiver Overruns (RX).
10BaseT	Error	DT2020	Number of Receive CRC Errors. (RX).
10BaseT	Error	DT2020	Number of Short Frame Errors. (RX).
10BaseT	Error	DT2020	Number of Non-Aligned Frame Error. (RX).
10BaseT	Error	DT2020	Number of Frame Length Violations. (RX).
10BaseT	Error	DT2020	Number of Unsupported Protocol Frames. (RX).
10BaseT	Error	DT2020	Number of Invalid UDP frames. (RX).
10BaseT	Error	DT2020	Number of Rx Frames w/IP Header Checksum Errors. (RX).
10BaseT	Error	DT2020	Number of Rx Frames w/ICMP Checksum Errors. (RX).
10BaseT	Error	DT2020	Number of ICMP Unreachable Destination Messages (RX).
10BaseT	Error	DT2020	Number of Rx Frames from Non-Peer Entity.
10BaseT	Error	DT2020	Number of Unknown ICMP Messages. (RX).
10BaseT	Error	DT2020	Number of Packets lost from TTL Network Error. (RX).
10BaseT	Error	DT2020	Number of Packets with wrong IP Destination Address (RX).
10BaseT	Error	DT2020	Number of Rx Packets with Unknown ARP Operations. (RX).

10BaseT	Error	DT2020	Number of Bad ARP Reply Packets Received.
10BaseT	Error	DT2020	Number of RFC894 Packets with an Unknown protocol type field. (RX).
10BaseT	Error	DT2020	Number of 802.3 Frames with an Unknown protocol type field. (RX).
RS-232,V.35	Error	SAM Trunk	Number of Frames aborted by CTS lost (TX).
RS-232, V.35	Error	SAM Trunk	Number of Frames Under-Run. (TX).
RS-232,V.35	Error	SAM Trunk	Number of Rx Frames Over-Run.
RS-232,V.35	Error	SAM Trunk	Number of Rx Frames with CRC Errors.
RS-232,V.35	Error	SAM Trunk	Number of Non-Aligned Frame Errors (RX).
RS-232,V.35	Error	SAM Trunk	Number of Frame Length Violations. (RX).
RS-232,V.35	Base	SAM Trunk	Number of DDS Packets Received from SAMx.
RS-232,V.35	Base	SAM Trunk	Number of DDS Packets Sent to SAMx.
SAMx	Base	SAM TCON	Number of SAMx Module Protocol Errors (Rx).
SAMx	Base	SAM TCON	Number of SAMx Module Protocol Errors (Tx).
SAMx	Base	SAM Port	Number of Intervals w/Ingress data.
SAMx	Base	SAM Port	Number of Intervals w/Egress data.
SAMx	Base	SAM Port	Number of Intervals with Port Errors.
SAMx	Error	SAM Port	Number of Intervals w/URP Receiver Errors.
SAMx	Error	SAM Port	Number of Intervals w/URP Retransmissions.

11 SAMPLE CONFIGURATION

Originate Ports Example

For this sample, consider the following requirements:

IP Address	135.17.59.205
Subnet Mask	255.255.255.0
Gateway Address	135.17.59.1
Trunk PHY type	V.35
Trunk Speed	56K
SAM Ports 1-8	Originate, Not PAP, Not PDD, 9600 Baud, No Parity, 8 Data Bits, NRZ encoding, Asynchronous Protocol, Double Break Attention Sequence.

The above requirements are implemented by the following commands:

```
Local ipaddr=135.17.59.205 submask=255.255.255.0
Gateway ipaddr=135.17.59.1
Trunk phy=v35 speed=56k
Rs dt2020
Rs sam mod
Port 1 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 2 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 3 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 4 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 5 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 6 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 7 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Port 8 type=orig prot=async baud=9600 dbits=8 parity=none attn=2brk
Rs sam p 1
Rs sam p 2
Rs sam p 3
Rs sam p 4
Rs sam p 5
Rs sam p 6
Rs sam p 7
Rs sam p 8
```

12 APPENDIX A: DT-2020 SPECIFICATIONS

12.1 DEVICE INTERFACES

12.1.1 CCITT V.35 DEVICE:

A standard interface used for interface and trunk modules. The V.35 interface uses a 34-pin connector and operates at data rates up to 2.048Mbps.

12.1.2 EIA RS-232-C DEVICE:

A standard interface that uses binary data interchange between DTE and DCE. The RS232-C interface uses a 25-pin (DB25) connector and up to 21 signal leads, and operates at data rates from 75 to 19200 bits per second (bps).

12.2 10BASE-T LAN:

Eight-pin, 10BaseT modular connector for a 10 Mbps baseband CSMA/CD local area network.

12.3 EIA RS-232C CONSOLE:

A standard interface that uses binary data interchange between DTE and DCE. The RS-232-C interface uses an RJ45 connector and operates at 9600 bits per second (bps).

12.4 PHYSICAL DIMENSIONS

DT-2020:	L=6.0" x W=1.4" x D=7.5"
Rack-mount Panel:	L=19" x W=10.5" D=0.125"
Stand-alone AC/DC Power:	L=3.5" x W=1.75" x D=2.5"
Power distribution Panel:	L=10.4" x W=. 8" x D=0.823"

12.5 ENVIRONMENTAL OPERATING RANGE

Operating Temperature:	5° to 40°C (41°F to 104°F)
Operating Humidity:	5% to 85%
Altitude:	From 60 m (197 ft.) below sea level to 1800 m (5905 ft.) above sea level

12.6 POWER REQUIREMENTS

DT-2020 Operating Voltage:	5V @ 800 mA Nominal
Stand-alone AC power supply:	115V @ 48mA Nominal 115V @ 90 mA Maximum
Stand-alone DC power supply:	48V @ 104 mA Nominal 48V @ 195 mA Maximum
Rack-mount DC (six units):	48V @ 624 mA Nominal 48V @ 1.17 A Maximum

12.7 REGULATORY INFORMATION

12.7.1 DT-2020

Safety: UL, CSA, VDE GS

EMC: FCC Part 15B Class A, ICES-003 Class A, CE EMC Directive 89/336/EEC

NEBS: Level 3

This Class A digital apparatus complies with Canadian ICES-003.

Note

This equipment has been tested and found to comply with limits for Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Special Accessories Note

In order to comply with the limits for Class A, Radio Frequency Devices, Subpart B- Unintentional Radiators (digital devices) Part 15 Rules, the user must use the cables available with this product, a RJ45 terminated shielded console cable and a DB25 to V.35 shielded adapter. In addition, the 10BASET and RS-232 cabling must have ferrite beads installed on both their ends.

13 HARDWARE WARRANTY

The warranty period for hardware shall be one year from the date of delivery. Replacements and repairs are guaranteed for the longer of the remaining original warranty period or 90 days.

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