



Quick Note 46

Temperature Monitoring on Digi TransPort Routers

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Contents

1	Introduction	3
1.1	Outline	3
1.2	Assumptions	3
1.3	Corrections	3
1.4	Version	3
2	Digi TransPort Configuration.....	4
2.1	Digi Remote Manager	4
2.1.1	Health Metrics Reporting	4
2.1.2	Health Metrics Thresholds	4
2.2	Web Interface	5
2.2.1	Health Metrics Reporting	5
2.2.2	Automatic Subsystem Shutdown	5
2.3	SNMP.....	6
2.3.1	Event 230 – for critical temperature conditions	6
2.3.2	Event 301 – for warning temperature conditions	7
2.3.3	Event 317 – when temperature conditions return to normal.....	7
2.4	Command Line Interface	7
3	Operational Status	8
3.1	Digi Remote Manager	8
3.2	Web Interface	9
3.3	SNMP.....	10
3.4	Command Line Interface	10
4	Configuration File.....	12
4.1	Configuration File.....	12

1 INTRODUCTION

1.1 Outline

This Quick Note describes how to configure temperature monitoring of certain components in a Digi TransPort router. Network Operations Managers may want to configure monitoring through Remote Manager or SNMP to get alerted whenever the router operates outside of recommended parameters.

1.2 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product and of the requirements for their specific application. It also assumes a basic ability to access and navigate a Digi Transport router and configure it with basic routing functions.

This Quick Note applies to:

Product	Processor	Mainboard	Cellular modem
TransPort WR11	Yes	No	Yes
TransPort WR21	Yes	No	Yes *
TransPort WR41v2	No	No	Yes *
TransPort WR44v2	No	Yes	Yes *

* Supported cellular modems:

- Huawei EM820 (Gobi 3000), ME909u-521
- Sierra Wireless MC7354
- Telit LE910, HE910-D

Firmware versions: 5.2.10 and later

Configuration: This Quick Note assumes the devices are set to their factory default configurations. Most configuration commands are only shown if they differ from the factory default.

1.3 Corrections

Requests for corrections or amendments to this Quick Note are welcome and should be addressed to: tech.support@digicom.com. Requests for new Quick Notes can be sent to the same address.

1.4 Version

Version Number	Status
1.0	Published
1.1	Rebranding + WR31 update

2 DIGI TRANSPORT CONFIGURATION

2.1 Digi Remote Manager

2.1.1 Health Metrics Reporting

Mainboard and cellular modem temperature monitoring are supported in Remote Manager via Health Metrics Reporting. They are part of the System Metrics and Mobile Metrics groups of metrics, respectively. For general information about Health Metrics Reporting, see the [Remote Manager User Guide](#).

In Remote Manager, go to **Device Management** and double-click the device you would like to enable Health Metrics Reporting for. Then go to **Configuration** → **Remote Management** → **Remote Manager** → **Health Metrics Reporting** and set System Metrics and Mobile Metrics to “On”.

Parameter	Setting	Description
System Metrics	On	Enables reporting of system metrics, such as CPU utilization, free RAM and temperature.
Mobile Metrics	On	Enables reporting of cellular modem metrics, such as network information, signal strength and temperature.

2.1.2 Health Metrics Thresholds

Each health metric has a set of normal, warning and error thresholds. They are pre-defined for each device, but can be adjusted for a specific application.

In Remote Manager, go to **Dashboard** → **Device Type** and click on the cogwheel of the device type you want to adjust. Scroll down to the Temperature group, click the “**Edit**” button to make any adjustments, then click the “**Save**” button.

<input checked="" type="checkbox"/>	ERROR < -41 C	WARNING < -30 C	NORMAL < 60 C	WARNING < 86 C	ERROR	Edit
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2.2 Web Interface

2.2.1 Health Metrics Reporting

Mainboard and cellular modem temperature monitoring are supported in Remote Manager via Health Metrics Reporting. They are part of the System Metrics and Mobile Metrics groups of metrics, respectively. For general information about Health Metrics Reporting, see the [Remote Manager User Guide](#).

In the device's web interface, go to **Configuration → Remote Management → Remote Manager → Health Metrics** and check Enable System Metrics and Enable Mobile Metrics. Click **“Apply”**, then **“Save All”**.

Parameter	Setting	Description
Enable System Metrics	Checked	Enables reporting of system metrics, such as CPU utilization, free RAM and temperature.
Enable Mobile Metrics	Checked	Enables reporting of cellular modem metrics, such as network information, signal strength and temperature.

2.2.2 Automatic Subsystem Shutdown

The device can be configured to automatically shut down on-board components in response to certain exceptional temperature conditions.

In the device's web interface, go to **Configuration → System → Temperature Monitoring** and check either or both of the following parameters. Click **“Apply”**, then **“Save All”**.

Parameter	Setting	Description
Power off subsystems when motherboard above operating temperature limit *	Checked	Enables automatic shutdown of various subsystems when the mainboard temperature sensor indicates that it's operating above its normal temperature range.
Power off modem RF when module above operating temperature limit	Checked	Enables automatic shutdown of the cellular modem's RF interface when the cellular modem's temperature sensor indicates that's operating above its normal temperature range.

* Digi TransPort WR44v2 only. The subsystems that are shut down (if present) are: all Ethernet ports, the cellular modem, Wi-Fi, GPS, DSL, and the external USB socket.

2.3 SNMP

An SNMP trap can be generated from any Digi TransPort event; see [Quick Note 36: Configuring SNMP Trap alerting on a TransPort router](#) for information regarding the configuration and use of SNMP traps.

There are six possible Digi TransPort events related to temperature monitoring:

Event	Description	Reasons
230	CRITICAL: %c	
301	WARNING: %c	
317	%c	
318	Power control changed CPU speed	1 High 2 Medium 3 Low
319	Power control turned off subsystem	1 LEDs 2 Ethernet 3 Mobile Module 4 GPS 5 Wi-Fi 6 DSL 7 USB
320	Power control turned on subsystem	1 LEDs 2 Ethernet 3 Mobile Module 4 GPS 5 Wi-Fi 6 DSL 7 USB

The first three of these events are expanded with specific information on the condition that's occurred as described below.

2.3.1 Event 230 – for critical temperature conditions

This event is logged if the processor, mainboard or cellular modem temperature exceeds its normal operating temperature, i.e. the temperature for which these components are specified. Continuing to operate the router in this condition may result in thermal damage to some components. The event is expanded as in the following example event log entries:

```
12:34:56, 01 Apr 2015,CRITICAL: Processor: 108'C is above operating temp. limit of 105'C
12:34:56, 01 Apr 2015,CRITICAL: Mainboard: 71'C is above operating temp. limit of 65'C
12:34:56, 01 Apr 2015,CRITICAL: Cell Modem: 89'C is above operating temp. limit of 85'C
```

In addition, if the device is configured to power off subsystems when the mainboard is above its operating temperature limit, this event is expanded and logged as follows:

```
12:34:56, 01 Apr 2015,CRITICAL: Powering-off subsystems in 30 secs to prevent thermal damage
```

Similarly, if the device is configured to power off the cellular module's RF interface when the cellular module is above its operating temperature limit, this event is expanded and logged as follows:

```
12:34:56, 01 Apr 2015,CRITICAL: Powering-off modem RF in 30 secs to prevent thermal damage
```

2.3.2 Event 301 – for warning temperature conditions

This event is logged if the processor, mainboard or cellular modem temperature is getting close to (within 5°C of) its specified operating temperature limits (either upper or lower).

On the WR44v2, if the mainboard temperature is within 5°C of its upper operating temperature limit the processor's core frequency is lowered to reduce overall system load, but otherwise no further action is taken at this point.

The event is expanded as in the following example event log entries:

```
12:34:56, 01 Apr 2015,WARNING: Processor: 103'C is above warning temp. limit of 100'C
12:34:56, 01 Apr 2015,WARNING: Mainboard: 64'C is above warning temp. limit of 60'C
12:34:56, 01 Apr 2015,WARNING: Cell Modem: 83'C is above warning temp. limit of 85'C
```

2.3.3 Event 317 – when temperature conditions return to normal

This event is logged when the processor, mainboard or cellular modem temperature returns to normal, i.e. when no warning or critical condition is in effect.

The event is expanded as in the following examples event log entries:

```
12:34:56, 01 Apr 2015,Processor is operating at normal temperature
12:34:56, 01 Apr 2015,Mainboard is operating at normal temperature
12:34:56, 01 Apr 2015,Cell Modem is operating at normal temperature
```

2.4 Command Line Interface

Health metrics reporting of the System Metrics and Mobile Metrics groups can be configured with the following CLI commands:

Entity	Instance	Parameter	Values	Equivalent Web Parameter
metrics	0	system_metrics	ON, OFF	Enable System Metrics
metrics	0	mobile_metrics	ON, OFF	Enable Mobile Metrics

Automatic subsystem shutdown can be configured with the following CLI commands:

Entity	Instance	Parameter	Values	Equivalent Web Parameter
templog	0	mb_autooff *	ON, OFF	Power off subsystems when motherboard above operating temperature limit
templog	0	mo_autooff	ON, OFF	Power off modem RF when module above operating temperature limit

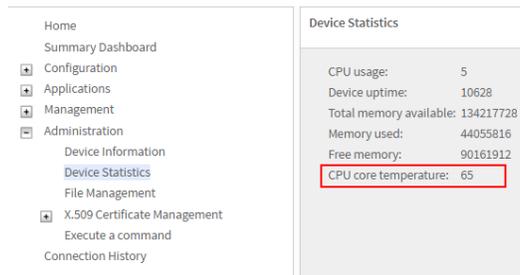
* Digi TransPort WR44v2 only.

3 OPERATIONAL STATUS

3.1 Digi Remote Manager

Temperature information for the mainboard and cellular modem is available in Remote Manager's System Metrics and Mobile Metrics data streams. In Remote Manager, go to **Device Management** and double-click the device you would like to inspect. Click the **View Device Streams** button.

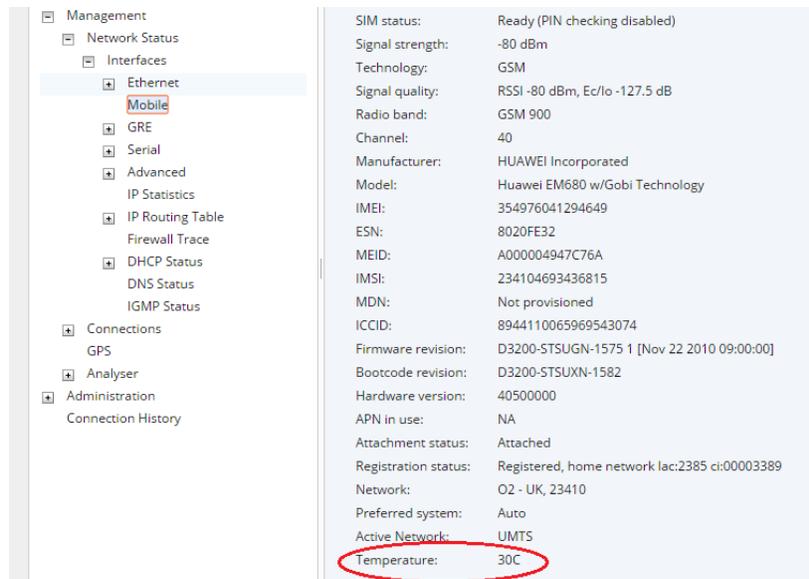
To view the current processor temperature in Remote Manager, go to **Device Management** and double-click the device you would like to inspect. Go to **Administration** → **Device Statistics**:



The screenshot shows the 'Device Statistics' page in Remote Manager. The left sidebar contains a navigation menu with 'Administration' expanded to show 'Device Statistics'. The main content area displays various system metrics:

CPU usage:	5
Device uptime:	10628
Total memory available:	134217728
Memory used:	44055816
Free memory:	90161912
CPU core temperature:	65

To view the current cellular modem temperature in Remote Manager, go to **Device Management** and double-click the device you would like to inspect. Go to **Management** → **Network Status** → **Interfaces** → **Mobile**:



The screenshot shows the 'Network Status' page in Remote Manager, with 'Mobile' selected under 'Interfaces'. The main content area displays various cellular modem metrics:

SIM status:	Ready (PIN checking disabled)
Signal strength:	-80 dBm
Technology:	GSM
Signal quality:	RSSI -80 dBm, Ec/Io -127.5 dB
Radio band:	GSM 900
Channel:	40
Manufacturer:	HUAWEI Incorporated
Model:	Huawei EM680 w/Gobi Technology
IMEI:	354976041294649
ESN:	8020FE32
MEID:	A000004947C76A
IMSI:	234104693436815
MDN:	Not provisioned
ICCID:	8944110065969543074
Firmware revision:	D3200-STSUGN-1575 1 [Nov 22 2010 09:00:00]
Bootcode revision:	D3200-STSUXN-1582
Hardware version:	40500000
APN in use:	NA
Attachment status:	Attached
Registration status:	Registered, home network lac:2385 ci:00003389
Network:	O2 - UK, 23410
Preferred system:	Auto
Active Network:	UMTS
Temperature:	30C

3.2 Web Interface

The current temperature information for the processor, mainboard and cellular modem are available on the web interface home page on the **System** and **Cellular** tiles:

[Home](#)

System	Cellular
<p>Model: TransPort WR21 Part Number: WR21-L42A-DE1-XX Serial Number: 295763 FW Version: 5.2.15.6 (Aug 17 2016 17:42:05) Image Number: 0 Boot Version: 7.56u Uptime: 20 minutes 13 seconds System Time: 15 Jan 2000 5:31:53 CPU Utilization: 1% (Min: 1%, Max: 99%, Avg: 1%) Temperature: 67°C (CPU) Description: Contact: Location:</p> <p>more</p>	<p>Module: MC7710 SIM: Not detected (using SIM 1) Signal Strength: Excellent (-44 dBm) Signal Quality: Excellent (-3.0 dB) Uptime: Not Available Temperature: 42°C IP address: Not Available DNS Server: Not Available Data Received: Not Available Data Sent: Not Available</p> <p>more</p>

3.3 SNMP

See [Quick Note 17: MIB file creation for use with SNMP clients](#) for a description of how to generate a Digi TransPort MIB file for use with an SNMP client.

The current temperature information for the processor, mainboard and cellular modem are available in the Sarian-Monitor MIB as the following SNMP objects:

Name	OID	Description
temperature	iso.3.6.1.4.1.16378.10000.3.11	The internal temperature of the device in Celsius.
processorTemperature	iso.3.6.1.4.1.16378.10000.3.12	The temperature of the processor in Celsius.
modemTemperature	iso.3.6.1.4.1.16378.10000.3.13	The temperature of the cellular modem in Celsius.

3.4 Command Line Interface

The current temperature information for the processor, mainboard and cellular modem can be displayed with the “temp” command:

```
temp
core: 45 'C
mb: 42 'C
mo: 41 'C
OK
```

where “core”, “mb” and “mo” refer to the processor, mainboard and cellular modem respectively.

Extended temperature history information for the processor, mainboard and cellular modem can be displayed with the “templog 0 info” command:

```
templog 0 info
Temperature log period : 4 hours, 29 minutes

Sensor 0: Processor
Maximum temperature : 45'C, seen at 17:31:00, 18 Mar 2015
Minimum temperature : 30'C, seen at 09:26:35, 16 Mar 2015
Period below operating temp. limit of 5'C : 0 hours, 0 minutes
  last seen at : no reading
Period below warning temp. limit of 10'C : 0 hours, 0 minutes
  last seen at : no reading
Period above warning temp. limit of 100'C : 0 hours, 0 minutes
  last seen at : no reading
Period above operating temp. limit of 105'C : 0 hours, 0 minutes
  last seen at : no reading

Sensor 1: Mainboard
Maximum temperature : 73'C, seen at 14:59:18, 24 Mar 2015
Minimum temperature : 32'C, seen at 13:49:16, 25 Mar 2015
Period below operating temp. limit of 0'C : 0 hours, 0 minutes
  last seen at : no reading
Period below warning temp. limit of 5'C : 0 hours, 0 minutes
  last seen at : no reading
Period above warning temp. limit of 60'C : 0 hours, 3 minutes
  last seen at : 15:00:18, 24 Mar 2015
Period above operating temp. limit of 65'C : 1 hours, 34 minutes
  last seen at : 14:59:18, 24 Mar 2015

Sensor 2: Cell Modem
Maximum temperature : 97'C, seen at 14:59:18, 24 Mar 2015
Minimum temperature : 25'C, seen at 13:47:17, 25 Mar 2015
Period below operating temp. limit of -30'C : 0 hours, 0 minutes
```

last seen at : no reading
Period below warning temp. limit of -25'C : 0 hours, 0 minutes
last seen at : no reading
Period above warning temp. limit of 80'C : 0 hours, 0 minutes
last seen at : no reading
Period above operating temp. limit of 85'C : 0 hours, 1 minutes
last seen at : 14:59:18, 24 Mar 2015

OK

4 CONFIGURATION FILE

4.1 Configuration File

For following configuration file entries are applicable to the parameters directly mentioned in this Quick Note:

```
templog 0 mb_autooff ON
templog 0 mo_autooff ON
metrics 0 system_metrics ON
metrics 0 mobile_metrics ON
```