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## **MicroMet MBTU10X R2.02**

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MicroMet MBTU10X revision 2.02 is the latest revision for multiple data group messaging, replacing revision 2.01.

### **R2.02 Features**

R2.02 retains all of the features found in R2.01, expands the Remote Status Report features, and adjusts message transmit duty limits.

#### **Features Carried forward from R2.01**

- ☑ Prioritized, last-in-first-out message queue allows the CR10X to enqueue a number of data messages, setting the priority and sensor group for each. Priority is 1 through 10, with 1 being the highest priority. Messages are delivered highest priority, youngest message first.
- ☑ Time automatically synchronized with AMBCS. This has no effect on the CR10X time.
- ☑ Automatic daily remote status message sent to AMBCS. This message is enqueued at priority 0 (highest), and as data message group 0. This message is generated by MicroMet, and will be generated even if the CR10X is not operating.
- ☑ Requires 7XX.XX CR10X programming. The CR10X program sets the data message priority and data group ID.
- ☑ CSIO or CR10X control port IO compatible.

#### **New Features in R2.02**

- ☑ Programmable Remote Status Reporting. This feature allows you to tell MicroMet to send periodic status reports throughout the day. The periodic status reports send status counters that reflect activity for the time period being reported. Report periods can be adjusted from 3 additional reports per day, to 1 additional report each hour. See the **STATPER** command below for details.
- ☑ New message transmit attempt maximums. Maximum transmit attempts are now specific to message priority level. This feature will help to assure that the highest priority message will be delivered. Transmit attempts are as follows:
  - Priority 0: 30 tries
  - Priority 1: 30 tries
  - Priority 2: 25 tries
  - Priority 3 thru 9: 20 tries
  - Priority 10: 10 tries
- ☑ Expanded Stat Display. R2.02 adds two new fields to the console stat display, relating to message expiration. See the **STAT** command below for details.
- ☑ Expanded Remote Status Counters. R2.02 adds two new counters to the Remote Status. See **Remote Status Reports** below for a full description.

## Upgrading from MBTU10X R1.05 , R1.06 or R2.01 to R2.02

Upgrading existing MicroMet data is very simple. This version is 100 percent hardware compatible with versions using 1.05, 1.06, or 2.01. Older versions may require an upgraded transceiver interface PCB. R2.02 requires the CR10X to set each message's priority and group number, so CR10X programming for older versions will need to be updated. Version numbers in the 700 series will be designed for R2.02.

1. Unplug, or turn off the MicroMet power.
2. Replace the MicroMet EPROM, located under the XINT02 Transceiver Interface PCB. Always support the MicroMet PCB when installing a new EEPROM to prevent damage to the board.
3. Connect your PC to the MicroMet as usual, and start your communication program (Hyperterm, etc).
4. Plug in, or turn on the MicroMet power.
5. Observe the MicroMet coldstart.
6. Set these MicroMet parameters as follows:
  - Txrate 7
  - Txperhour 200
  - Statper 4
  - Verbose 5
  - Msglen 11
  - Id nnnn - set the AMBCS network ID
7. Update the CR10X program to compatible version

R2.02 should now be ready to go. Observe communications as usual, noting MicroMet advisories and warnings.

### Remote Status Reports

R2.02 is capable of generating two types of automatic Remote Status Reports: A Daily Report, which provides counters that apply to the entire 24 hour day, and an adjustable Periodic Report, which provides counter that apply to the adjustable Status Report Period Interval. Report fields are the same for both reports, but the value of the fields, apply to the report type. For instance, if the Periodic Status Report Interval is set to 1, then the values in the Periodic Report apply to the previous hour only, if set to 4, values apply the previous 4 hour Interval. In this way, MicroMet can report on its performance over smaller increments of time, providing a better picture of performance as it relates to the time of day. Periodic Status Reports are assigned a priority of 9, while Daily Status Reports are assigned a priority of 0 (highest). Thus Periodic Reports will not preempt CR10X generated data messages.

#### Remote Status Report Fields

1	RXSP	Number of Receiver Signal Presence events.
2	SYNC	Number of SYNC characters detected.
3	RERR	Number of Receiver Errors detected.
4	TXTX	Number of Transmit events.
5	RACK	Number of Received Message Acknowledgements.
6	VSWR	Number of High VSWR events.
7	LPWR	Number of Transmit Low Power Events.
8	RATE	MicroMet's Transmit Attempt Rate
9	TXHR	MicroMet's Hourly Transmit duty cycle limit.
10	TTLE	Number of Time-To-Live message expirations
11	TXEX	Number of Transmit Limit Message Expirations

## Setting the Periodic Status Report Interval

R2.02 allows you to adjust the Periodic Status Report Interval using the **statper** command (**statper [n]**). The affect of the value of n is as follows:

<u>n</u>	<u>Reports per day</u>	<u>Report Times</u>
0	0	
1	23	0100, 0200, 0300 .. 2300
2	12	0200, 0400, 0600 .. 2200
3	7	0300, 0600, 0900 .. 2300
4	5	0400, 0800, 1200, 1600, 2000
5	4	0500, 1000, 1500, 2000
6	3	0600, 1200, 1600,

## R2.02 Command List

<b>CANMSG</b>	Fill the message queue with low priority messages. This is useful for testing communications prior to connecting a CR10X. Canned messages are assigned a priority level of 10 (lowest priority).
<b>CLREEPROM</b>	Clears the eeprom retained performance statistics, and several eeprom counters.
<b>HELP</b>	Display a list of commands descriptions.
<b>ID [NNNN]</b>	Set or display MicroMet's network ID.
<b>LIGHTS ON or OFF</b>	Turn the Transmitter Interface lights (LEDs) on or off. Lights turn off automatically at midnight.
<b>MSGLEN [n]</b>	Sets or displays the default message length. All subsequent data messages are forced to this number of sensor fields. The value of n can only be in the range of 11 through 15.
<b>RESET</b>	Reset MicroMet. Executes a system cold-start.
<b>RMP</b>	Force MicroMet to immediately generate a Periodic Remote Status Report.
<b>SHOWEEPROM</b>	Display some important EEPROM locations, and the EEPROM retained performance statistics.
<b>STAT</b>	Display performance statistics. Counters are displayed for the current hour and the current day. Fields displayed are: <ul style="list-style-type: none"><li>➤ <b>RXSP</b> Number of Receiver Signal Presence events.</li><li>➤ <b>SYNC</b> Number of detected Sync characters.</li><li>➤ <b>RXERR</b> Number of Reception Errors.</li><li>➤ <b>XMIT</b> Number Transmit Events</li><li>➤ <b>ACK</b> Number of Message Acknowledgements</li><li>➤ <b>HIVSWR</b> Number of HIVSWR Events detected</li><li>➤ <b>LOPWR</b> Number of TX LOW POWER events</li><li>➤ <b>TTLEXP</b> Number Time-To-Live message expirations</li><li>➤ <b>TXEXP</b> Number of Transmit Attempt expirations</li></ul>

**T** Force a data transmission if the TXQ is not empty.

**TXRATE [n]** Set or display the rate at which MicroMet may respond to Master Station probes. The value of n should be around 7 for most sites.

**TXPERHOUR [nnn]** Set or display the hourly transmit duty cycle. The value of nnn should be around 200 for most sites.

**TXQ** Display a list of all messages enqueued message for transport. Shows each message's unique ID, its time-to-live in minutes, and its transmit attempts. Messages are shown in the order in which they will be delivered.

S/N	PRI	TTL	TX'd
====	===	=====	=====
58	1	1440	1
51	2	1230	1
50	10	1440	0

**SHOWEEPROM** Shows the content of some important eeprom locations, and the eeprom retained performance statistics.

**STATPER [N]** Sets or displays the Periodic Remote Status Report Interval. The value of n may be in the range of 0 through 6 only. **If n is zero, then Periodic Status Reports are turned off.** This command affects only the Periodic Status Report rate new to R2.02, and has no affect on the midnight Status Report carried forward from R2.01. See also the section on **Remote Status Reports** above.

**TIME [YY MM DD hhmm]** Set or displays the MicroMet's time.

**TXPERHOUR [n]** Sets or displays the number of transmit attempts allowed each hour.

**TXRATE [n]** Sets or displays the transmit to sync attempt rate.

**VER** Displays the MBTU10X revision number.