Locator Protocol API version 1.0

February 9, 2018

1 Locator Data Query

Starting in version 2.6 of the TM1000, 2.2 of the WiFi clocks, 1.0 of the DotMatrix displays, and 4.4 of the POE clocks a remote data management protocol was implemented. This API was primarily for use by TM-Manager, but is available for management and some remote control of the devices.

1.1 Device Query

The Locator Data Service is a simple UDP/IP protocol that can be used by other network applications to extract status and location information from TM products.

1.1.1 POE, WiFi, and DotMatrix Device Query Format (Clocks)

Requesting information from the clocks is done by sending a 3 byte message to the Clock, using UDP/IP, to port 7372. The three bytes, in hexadecimal, are: 0xA1 0x04 0xB2 The TM1000A will also respond to a broadcast to the same port.

The response packet is 35 bytes and will be formatted as follows:

Bytes	Description
0	Device Type: 0x01=POE, 0x02=WiFi, 0x03=DotMatrix
1 to 4	client IP address
5 to 10	MAC address
11 and 12	firmware version Major:Minor
13 and 14	NTP Sync Count
15 to 17	Displayed Time: HH MM SS in each byte
18 to 20	Device Name as null terminated ASCII string

TM-Manager uses this protocol to find a monitor clocks on the network. A Wireshark capture of that software can be used to see an example of the data transfer.

1.1.2 TM1000/TM2000 Device Query

Requesting information from the TM1000A/TM2000A is done by sending a 3 byte message to the TMX000A, using UDP/IP, to port 7372. The three bytes, in hexadecimal, are: 0xA1 0x04 0xB2 The TMX000A will also respond to a broadcast to the same port.

The response packet is 80 bytes and will be formatted as follows:

Bytes	Description
0	TM1000A response value = 0x04, TM2000A=0x05
1 to 4	client IP address
5 to 10	MAC address
11 and 12	firmware version Major:Minor
13	Lock status 0=No Lock, 1=2D Lock, or 2=3D Lock
14 to 17	NTP Sync count, 32 bits, MSB to LSB
18 to 20	Current Time, H:M:S, UTC
21 to 45	Location of unit 25 bytes, Latitude, Longitude, null terminated
46 to 80	Name of Time Server, null terminated

TM-Manager uses this protocol to find a monitor TM1000A/TM2000A's on the network. A Wireshark capture of that software can be used to see an example of the data transfer.

1.2 Timer Control Sequences

The Up/Down counter timers can be controlled use the same UDP/IP API. Those sequences are documented in the following sections.

1.2.1 Use UpTimer

This command puts the clock into the UpTimer Mode. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xA2
1	Timer Display Mode: 0x00=MIN:SEC.Tenths, 0x01=HH:MM:SS
2	0x00

1.2.2 UpTimer Start/Pause

Toggles the UpTimer between running and paused. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xA3
1	0x00=Pause 0x01=Count Up **New in version 1.1
2	0x00

1.2.3 Uptimer Reset

Resets the UpTimer back to zero.   A single character 'A' Acknowledge is sent back.

Bytes	Description

0	Command Byte: 0xA4
1	Timer Display Mode: 0x00=MIN:SEC.Tenths, 0x01=HH:MM:SS
2	0x00

1.2.4 Use DownTimer

Sets DownTimer Mode on the clock. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xA5
1	Timer Display Mode: 0x00=MIN:SEC.Tenths, 0x01=HH:MM:SS
2	Starting Hour value for countdown
3	Starting Minute value for countdown
4	Starting Second value for countdown
5	Starting Tenths of a second value for countdown
6	End of countdown Alarm Enable. 0=Disabled, 1=Enabled
7	Alarm duration in seconds

1.2.5 DownTimer Start/Pause

Toggles the DownTimer between running and paused. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xA6
1	0x00=Pause 0x01=Count Up **New in version 1.1
2	0x00

1.2.6 DownTimer Reset

Resets the DownTimer back to starting value. Must already be in DownTimer Mode. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xA7
1	Timer Display Mode: 0x00=MIN:SEC.Tenths, 0x01=HH:MM:SS
2	Starting Hour value for countdown
3	Starting Minute value for countdown
4	Starting Second value for countdown
5	Starting Tenths of a second value for countdown
6	End of countdown Alarm Enable. 0=Disabled, 1=Enabled
7	Alarm duration in seconds

1.2.7 Set Clock to TimeMode

Returns the clock from the Up/Down Timer modes to regular time display. A single character 'A' Acknowledge is sent back.

Bytes	Description

0	Command Byte: 0xA8
1	0x01
2	0x00

1.2.8 Set DotMatrix Text

Sets the text string on the DotMatrix display. Scrolling direction and Justification are controlled as well. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xA9
1	ESC Character for Formatting: 0x1B
2	Bits 3:2=Scroll Direction (0=No Scroll, 1=Right to Left, 2=Bottom to Top Bits 1:0=Justification of Text (1=Left, 2=Center, 3=Right)
3	Scroll Speed
4	Text to display starts here, null terminated. 250 chars maximum with null

1.2.9 Set UpTimer Time While Running

Instantaneously changes the time of the UpTimer while it is running. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xAA
1	New HOUR value
2	New MINUTE value
3	New SECOND value
4	New TENTHS of a second value
5	New HUNDREDTHS of a second value

1.2.10   Set DownTimer Time While Running

Instantaneously changes the time of the DownTimer while it is running. A single character 'A' Acknowledge is sent back.

Bytes	Description
0	Command Byte: 0xAB
1	New HOUR value
2	New MINUTE value
3	New SECOND value
4	New TENTHS of a second value
5	New HUNDREDTHS of a second value

2 Revision History

2.1 Version 1.0   *Initial Release Feb 9, 2018*

2.2 Version 1.1   *Updated March 22, 2018*

- UpTimer and DownTimer Start/Pause commands were updated such that the second byte of each now has meaning in the command. This prevented repeated packets from negating the previous packets meaning. Support for this started in version 2.3 of the WiFi clock, 4.5 of the POE clock, and 1.1 of the DotMatrix.
- Support for TM2000A locator protocol.