Real-Time Monitoring

Product Overview

RTM (Real-Time Monitoring) watches and identifies the occurrence of an event in real time. When machine status has changed RTM gathers relevant information and the event is saved to file for further analysis.

Features

- Detect when event occurs
- Identify machine status
- Logging important information to file
- Create new event log file every day
- Compatible with MT9x
- Automatic shutdown
- Real Time Clock
- Serial communication
- Fast networking with Gigabit Ethernet
- 2.4 GHz and 5.0 GHz IEEE 802.11ac
- SFTP (Secure File Transfer Protocol)
- Network file sharing server
- Auto synchronization with external usb storage

Contents

Specifications

Real-Time Monitoring	
Processor	Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
Memory	4GB LPDDR4-3200 SDRAM
Network	Gigabit Ethernet
Wireless	2.4 GHz and 5.0 GHz IEEE 802.11ac wireless
Data Storage	32GB Micro SD
USB	2 USB 3.0 ports, 2 USB 2.0 ports
Communication Interface	Serial Interface via MAX3232
RTC (real time clock)	DS3231
Power	5V DC
Dimension	W = 6.4cm, L = 9.2cm, H = 5.2cm

Details

Real-Time monitoring system

When DC 5V power is supplied to the power connector the system is start initialized, on ready state RTM application software will start. Booting time is around 90 seconds. When RTM software runs it creates a new file with a filename containing date time and machine id. Due to the difference of interface command on the different machine model machine Id must present and not exceed 19 characters. After the serial hardware circuit is initialized, RTM is ready to communicate. RTM saves the current number of sort ICs, number of errors, number of jam and clear complete performance statistics, then starts to monitor machine status. When status changes RTM saves that event to file along with relevant information. New log file will be created when RTM is powered on or rebooted and every day at 00:00:00. When there is no power supply on the system RTM will automatically shut down. After the system is shut down and power supply is disconnected, wait for at least 90 - 180 seconds before reapplying power again.

Event log information

- Date Time
- Number of sort ICs Total
- Handler Mode and State
- Status details
- Error number and error message

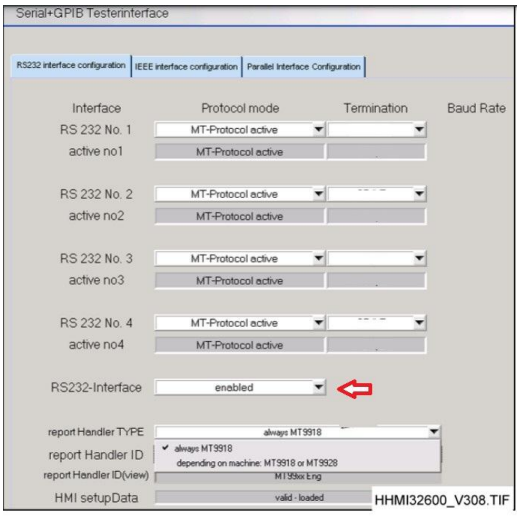
RTM Status

- RTM Booting or rebooting: green LED blink
- RTM on (running): red LED toggle every 1 seconds
- RTM off (shutdown, inactive):
    - red LED on
    - green LED off
- Event_loop running: green LED toggle every cycle of Event_loop
    - RTM use event loop to query information from handler
    - If data arrive immediately, RTM run next event loop
    - If no data arrive, Event_loop waits for wait_timeout seconds
    - wait_timeout is 10 seconds
- No power:
    - green LED off
    - red LED off

Setup

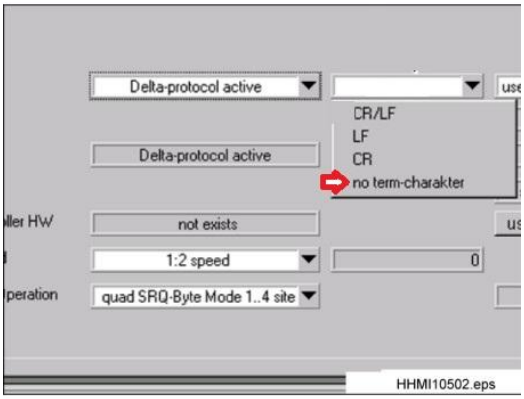
MT9x settings

- On Handler go to Interface Configuration page
    1. Enable RS232-Interface



Serial + GPIB Testerinterface panel

    2. Disable Termination: no term-character



Selection list: End of data character

    3. Machine ID field should be 9 character long which has MTxxxx-yy pattern where xxxx is machine model and yy is machine number, e.g. MT9510-01, MT9308-12

Cable connection

1. RS232 serial connection
    - While RTM status is power off or shutdown
    - Connect RTM RS232 DB9 pin 2 -> handler RS232 DB25 pin 3
    - Connect RTM RS232 DB9 pin 3 -> handler RS232 DB25 pin 2
    - Connect RTM RS232 DB9 pin 5 -> handler RS232 DB25 pin 7
2. Connect RJ45 cable from RTM ethernet port to LAN port of local network system
3. Connect power cable (DC 5V 3A) to RTM DC 5V jack

RTM settings

- No configuration is require, just power on RTM

Power On RTM

- Apply DC 5V 3A power supply to RTM

Power off / Shutdown RTM

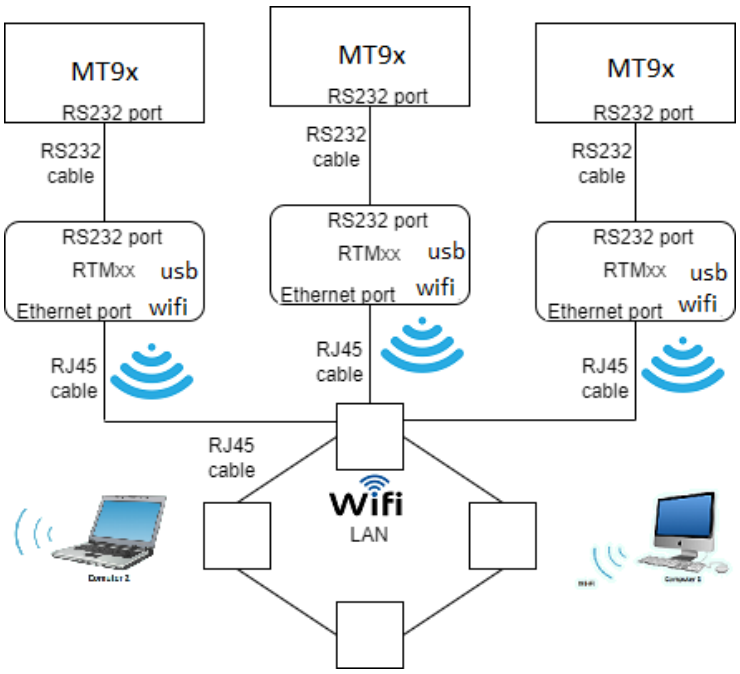
- Remove power supply from RTM

Reboot RTM

- Remove power supply from RTM
- Wait for 90 - 180 second
- Reapply power supply to RTM

Network and File sharing

RTM provides network and file sharing services for computers on a network (wire and wireless). Any computer on the network can access the event log folder on RTM as if it's just another local folder on that computer.



Wire LAN Network

Connection

- Connect RJ45 cable to RTM ethernet port
- Connect other end of RJ45 cable to local area network system
- Connect pc to local area network system

Scanning

- Power on RTM
- Wait for 90 - 180 second until RTM boot into ready state
- On computer open cmd terminal and scan for RTM0x
    - C:\Users\user>ping rtm04 -4
    -
    - Pinging rtm04 [192.168.1.97] with 32 bytes of data:
    - Reply from 192.168.1.97: bytes=32 time=20ms TTL=64
    - Reply from 192.168.1.97: bytes=32 time=2ms TTL=64
    - Reply from 192.168.1.97: bytes=32 time=2ms TTL=64
    - Reply from 192.168.1.97: bytes=32 time=2ms TTL=64
    -
    - Ping statistics for 192.168.1.97:
    - Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    - Approximate round trip times in milli-seconds:
    - Minimum = 2ms, Maximum = 20ms, Average = 6ms

Wireless LAN Network

Router configuration

- Set router wifi SSID to “RTM”
- Set passphrase to “xxxxxxxxxx” (email address for request passphrase is at the end of this document)
- Use WPA-PSK authentication
- Enable DHCP

Connection

- Power on wireless router
- Power on or reboot RTM
- After power on or reboot RTM will automatically connect to wireless network with SSID “RTM”
- On computer scan and connect to wireless SSID “RTM”
- Enter passphrase

Scanning

- After successful connect, open terminal and scan for RTM0x
    - C:\Users\user>ping rtm04 -4
    -
    - Pinging rtm04 [192.168.1.97] with 32 bytes of data:
    - Reply from 192.168.1.97: bytes=32 time=20ms TTL=64
    - Reply from 192.168.1.97: bytes=32 time=2ms TTL=64
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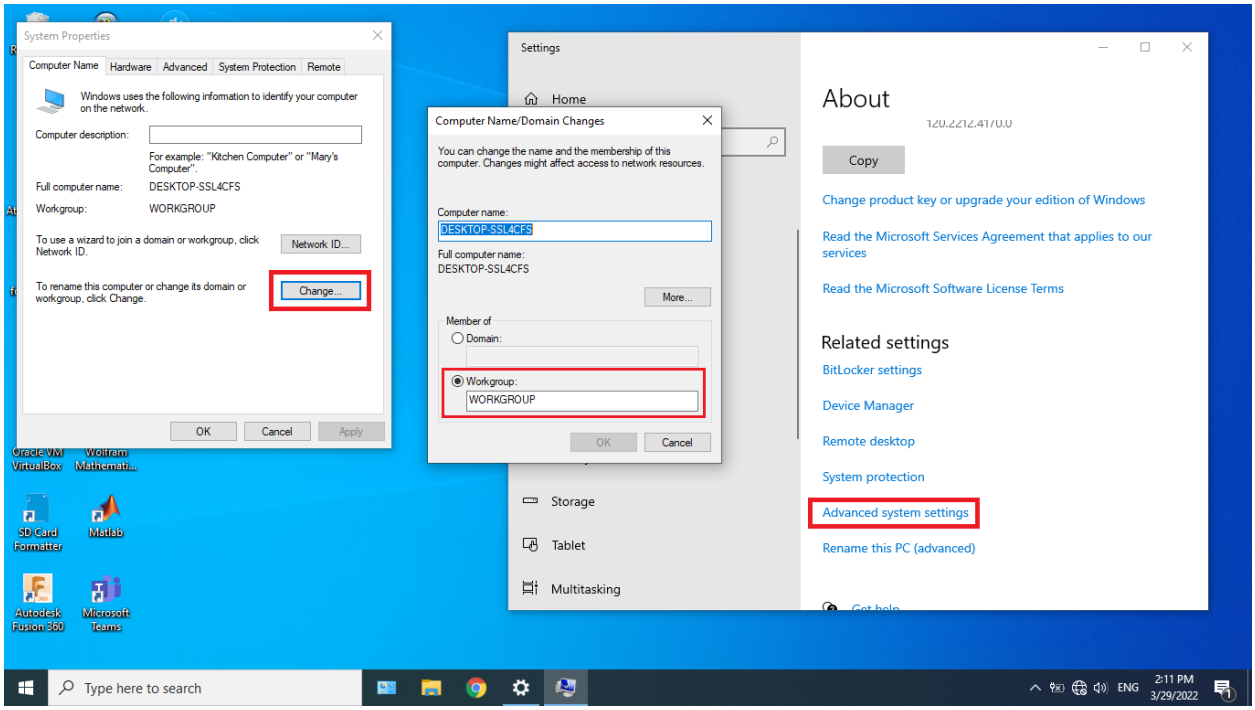
    - Reply from 192.168.1.97: bytes=32 time=2ms TTL=64
    -
    - Ping statistics for 192.168.1.97:
    - Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    - Approximate round trip times in milli-seconds:
    - Minimum = 2ms, Maximum = 20ms, Average = 6ms

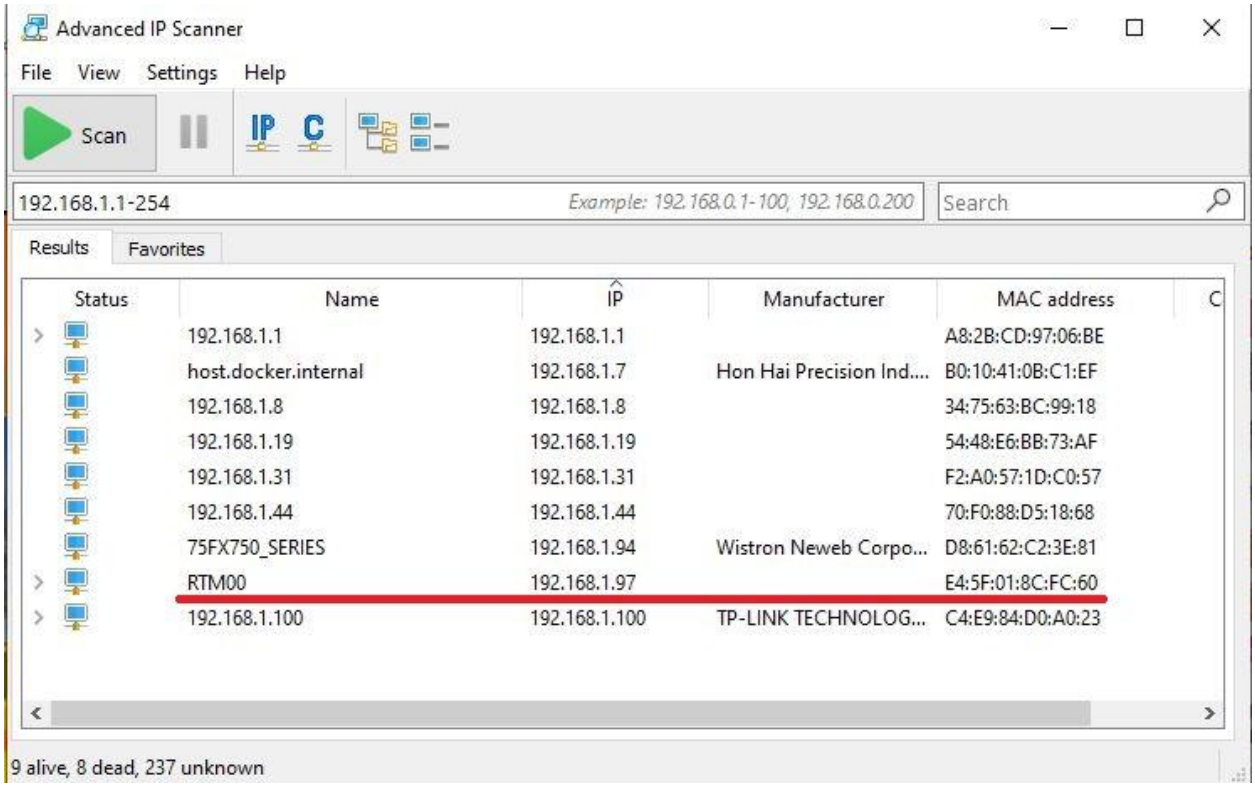
Workgroup / Domain

- RTM uses the default workgroup name which is “WORKGROUP”
- RTM and computer on the network must have same workgroup / domain
- If necessary, change settings of the remote computer to the same workgroup as RTM



Hostname and ip address

- On the local area network RTM will appear as RTMxx (xx is number ex: 01, 02, ..)
- Hostname is RTM00
- Ip address is 192.168.1.97



Multiple way to access RTM event log

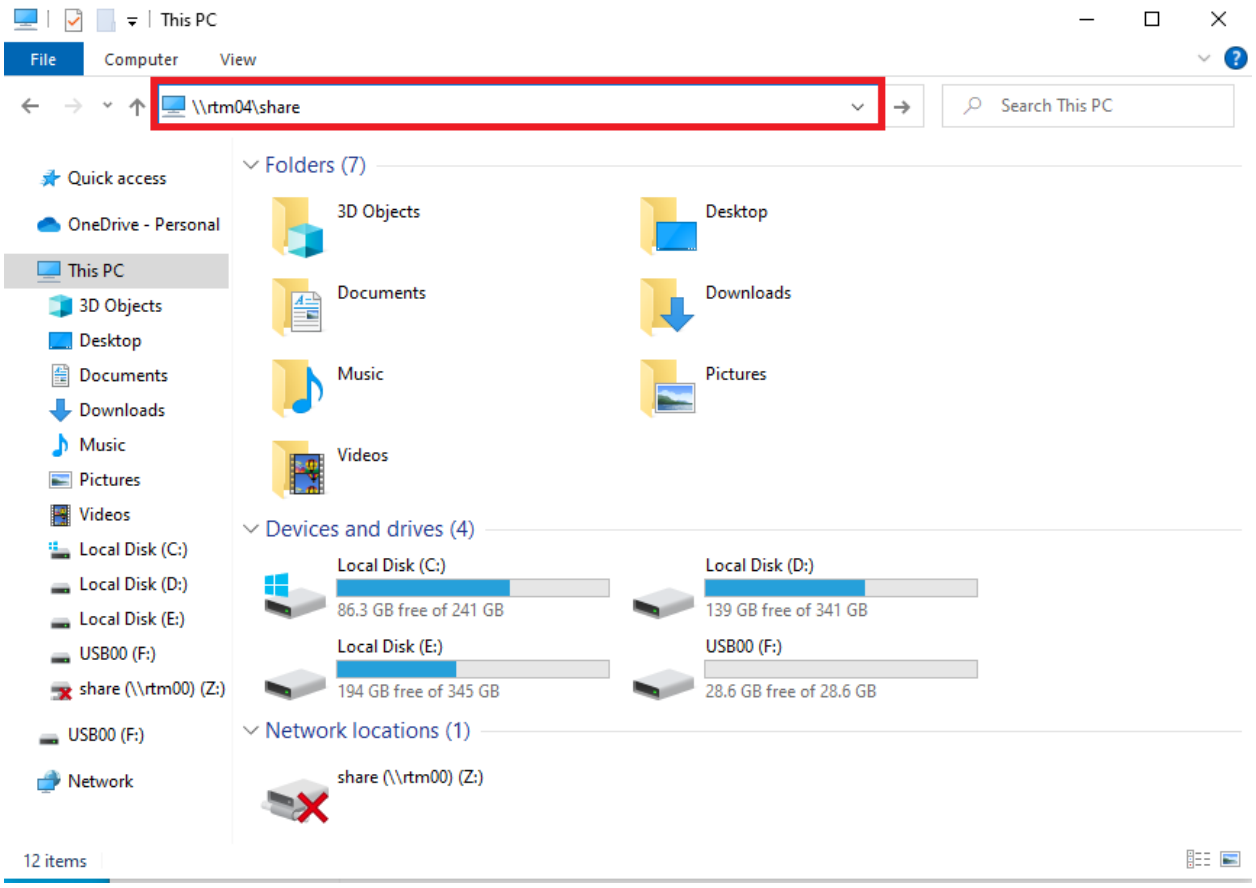
1. Quick access
2. Map Network Drive
3. SFTP (secure file transfer protocol)
4. External usb storage

Quick access

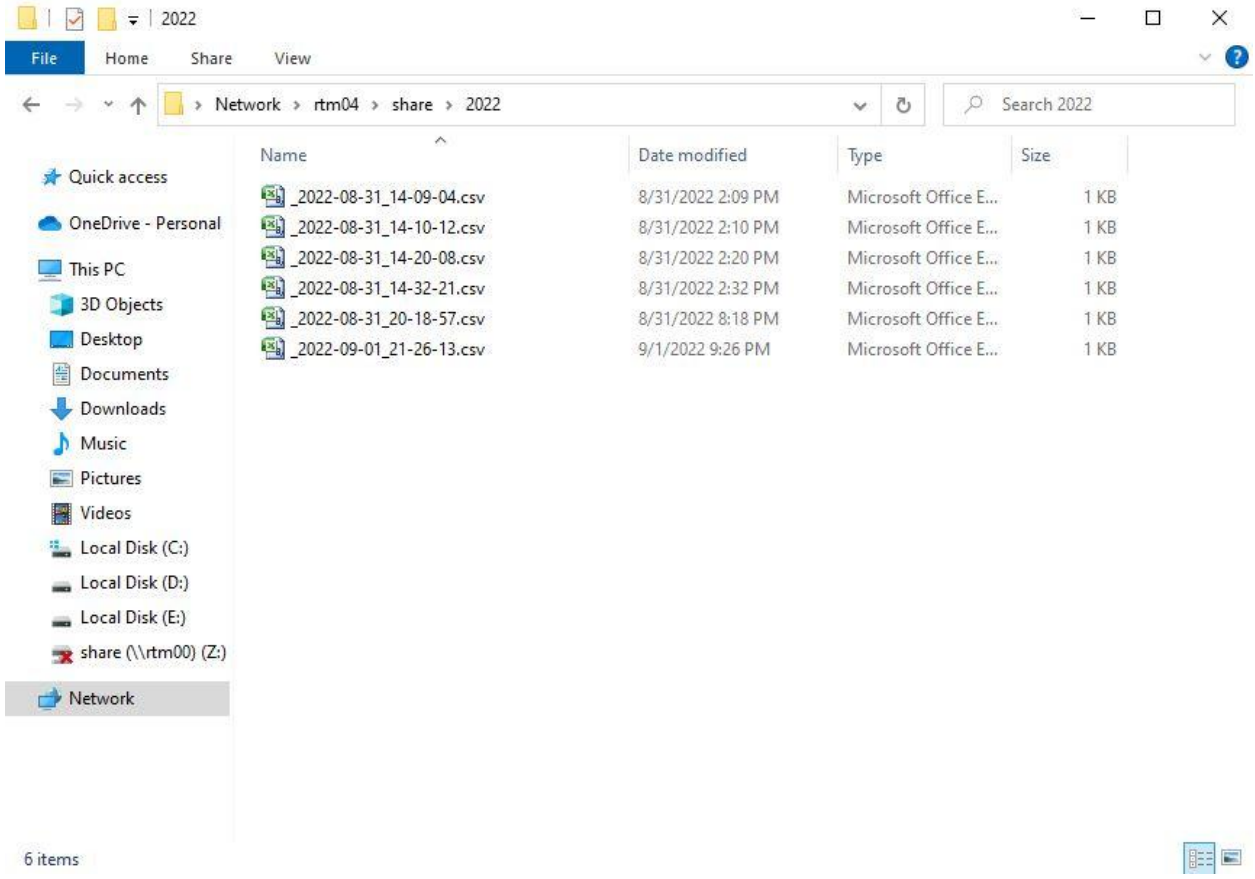
A quick and easy way to access a log file is to type RTM sharing folder path to address bar of File Explorer Windows.

1. Open file explorer windows (win key + E)
2. At the address bar type " \\hostname\share" or "\\ip address\share " and press enter (enter user name and password if system ask for credential, (email address for request user name and password is at the end of this document)

   Ex: "\\RTM0x\share" or "\\192.168.1.xxx\share" and press enter



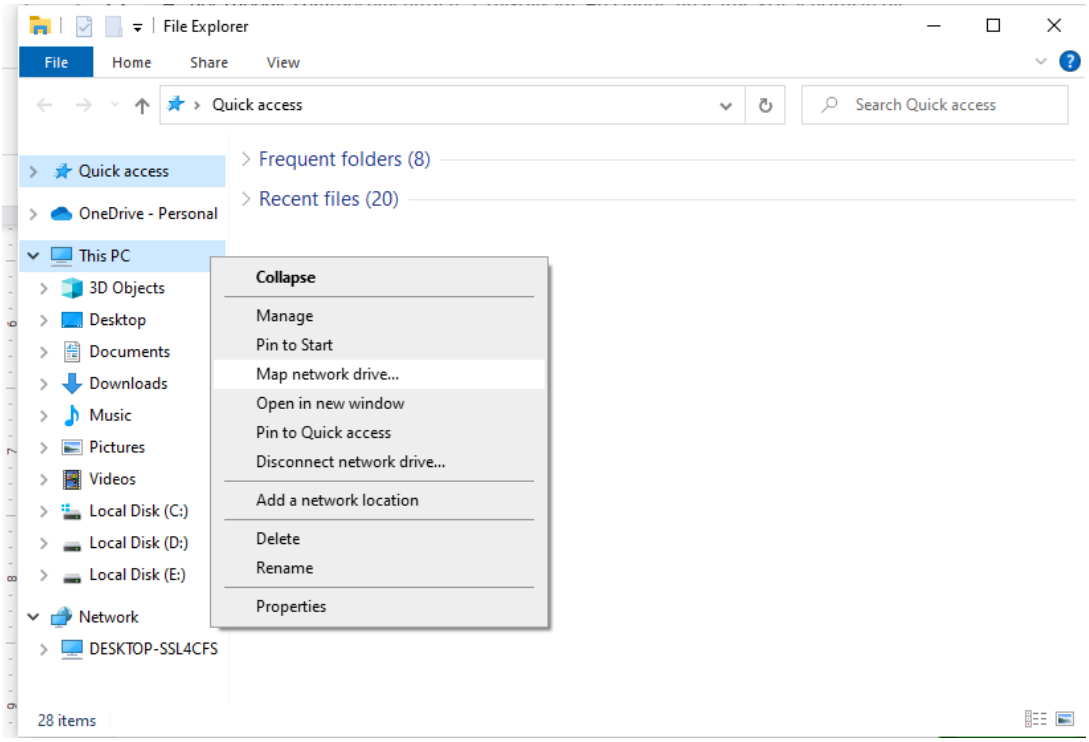
3. Access data in folder



Map network drive

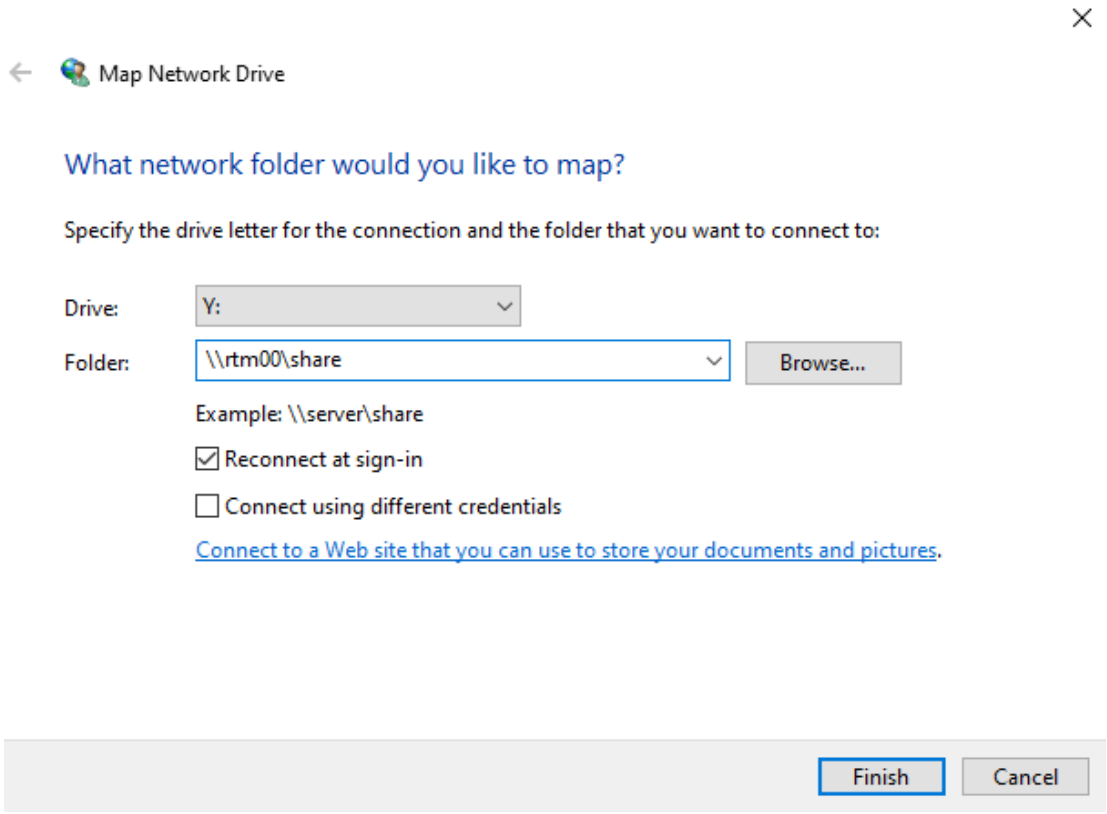
Windows operating system has a feature which can map a drive letter, e.g. X, Y, Z to RTM share directory on the network using Map network drive option on File Explorer Windows

1. Open file explorer windows (win key + E)
2. On left of window right click [This PC] icon



3. Click “Map network drive...”

4. In Map Network Drive window: Choose drive letter that is not already assign

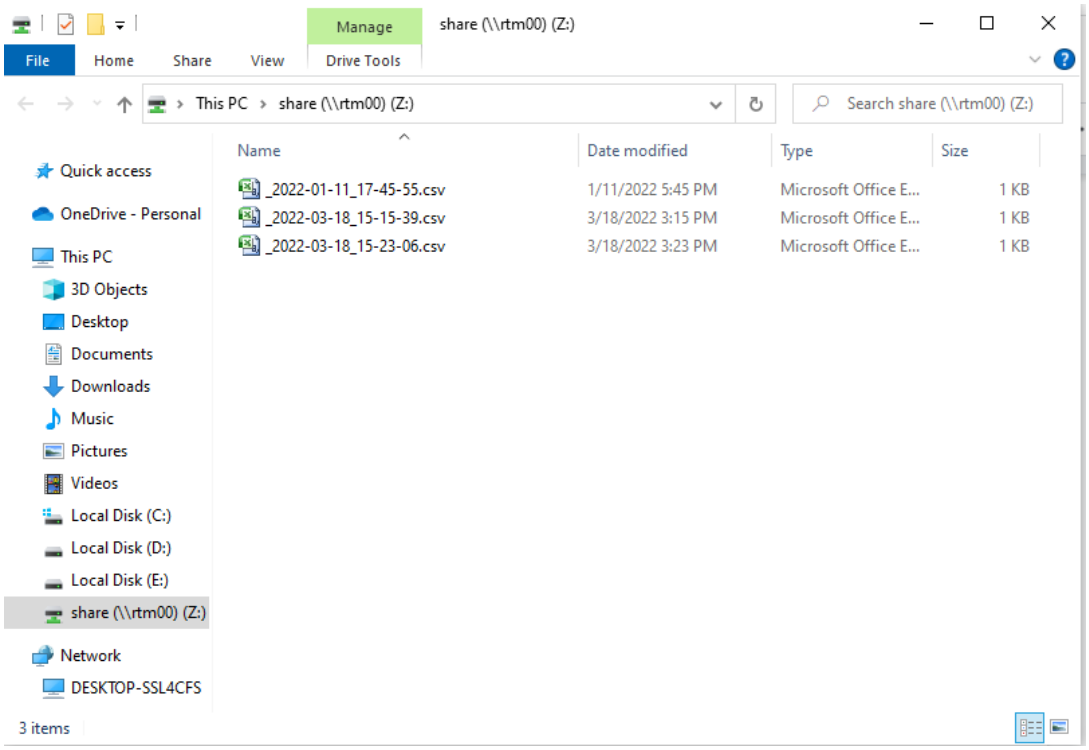


5. In Folder: textbox enter “\\hostname\share” or “ip address\share”

   Ex: “\\rtm01\share” or “\\192.168.1.xx\share”

6. Enter user name and password if require (email address for request user name and password is at the end of this document)
7. Click finish

8. Access data in folder

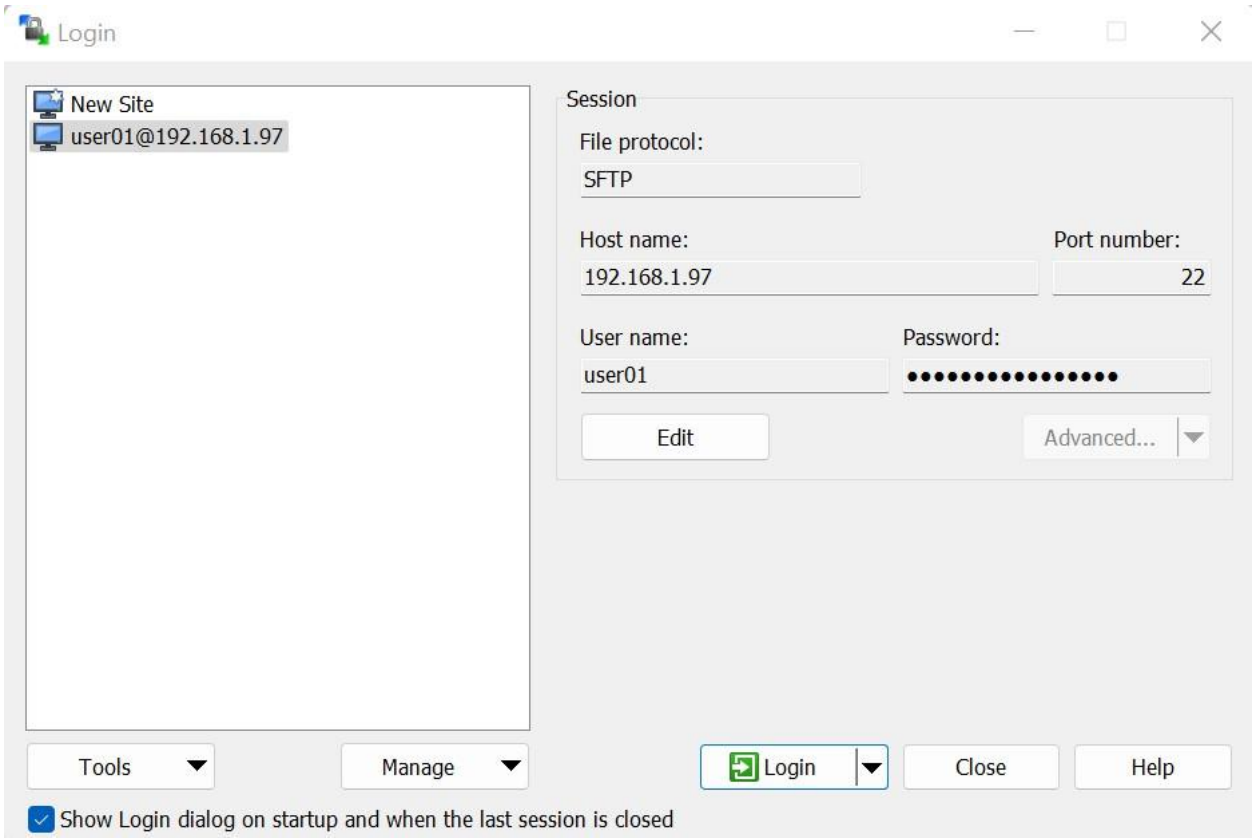


SFTP (Secure File Transfer Protocol)

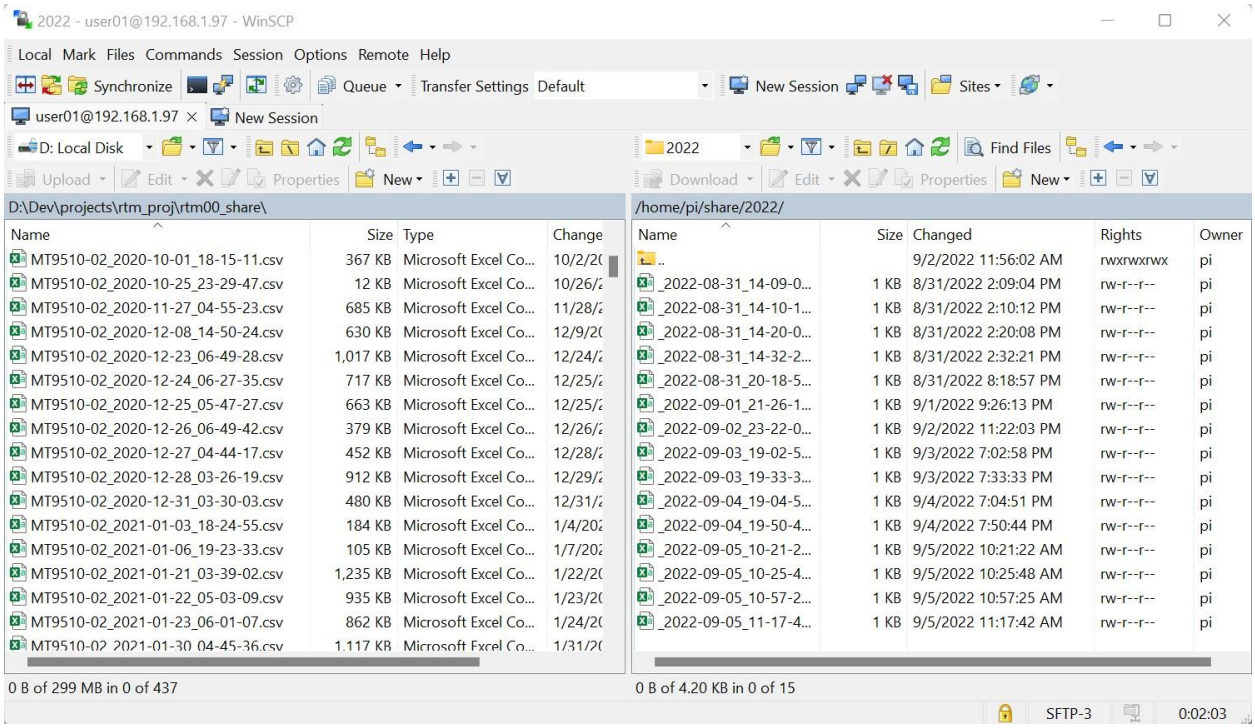
Computers on the same network system as RTM can transfer files to and from RTM using secure file transfer protocol.

SFTP Client configuration

1. Connect RTM to wire or wireless network
2. Connect pc to the same network (can be wire or wireless) as RTM
3. Open SFTP client
4. Select SFTP protocol and use port 22
5. Enter Host name ip address
6. Enter User name and Password (email address for request user name and password is at the end of this document)



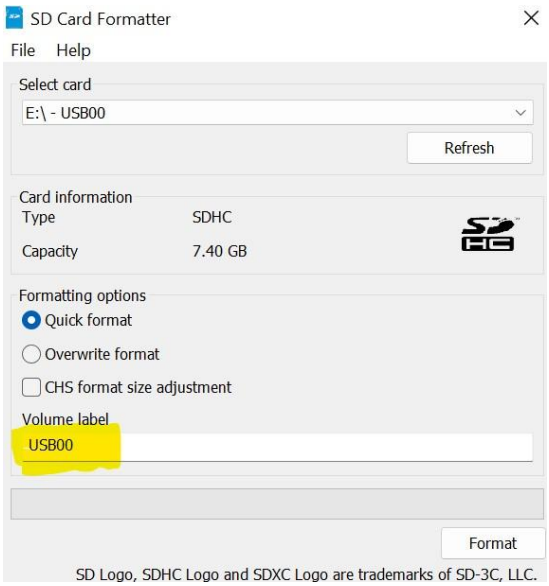
7. login
8. Navigate to /home/pi/share/



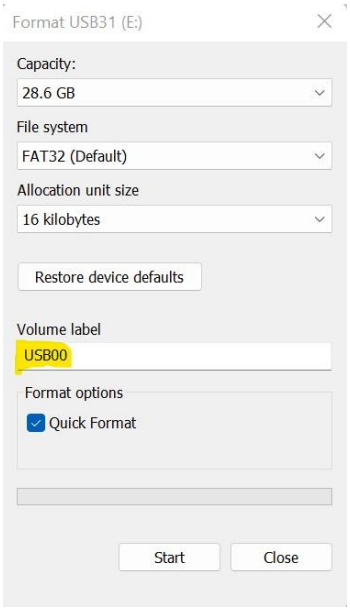
File transfer and synchronization between RTM and external usb storage

Format External USB storage

- Format usb storage with Volume Label = “ USB00 “
- If device is USB SD Card Reader, please use SD Card Formatter software from www.sdcard.org



- USB Flash Drive format on windows



Transfer and Synchronization

1. While red LED blink
2. Plug external usb storage (usb flash drive or usb micro sd card reader) into one of RTM usb port
3. RTM automatically detect external usb storage
4. RTM start data transferring and synchronizing with external storage
5. Red LED stay on indicate that data transfer and synchronize is completed
6. Unplug external usb storage

Event log file description

Column	details
Date	yyyy-mm-dd
Time	hh-mm-ss
D_Count	Number of sort ICs total
Mode1	Handler Mode
Mode2	Handler Mode
Status	Status number
Details	Status details
message	Error message
Error_C	Number of errors total
Jam_C	Number of jams total
Run_Time	Time in state “running”
OPreq_Time	Operator required time
Soking_Time	Time in state holding for temperature
Error_Time	Time in state error
Service_Time	Time in state service
Use_Time	Use time total
OP_Assist_Time	Operator assist time

Document version history

Version	Date	Description
1.0	2020/10/08	initial
1.1	2022/03/30	Add product picture, diagram, edit file access and network section
1.2	2022/09/03	Update file access, sync with external usb storage, SFTP, WIFI
1.3	2022/09/06	Add TOC, update mt9x setting pic
1.4	2022/10/02	update id character, e.g. MT9510-01
1.5	2022/10/10	Update cable connection, RTM status

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