Advantech AE Technical Share Document

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Category	■FAQ □SOP	Related OS	N/A
Abstract	What are the differences between communication WDT, system WDT, FSV WDT of WISE-4000 series?		
Keyword	WISE, communication WDT, system WDT, FSV WDT		
Related Product	WISE-4010/LAN, WISE-4050/LAN, WISE-4060/LAN, WISE-4012, WISE-4012E, WISE-4050, WISE-4051, WISE-4060, WISE-4220-S231		

■ **Problem Description:**

There are some watchdog timers in WISE-4000 and WISE-4220 series. What exactly are they? What do they do? When and what will trigger a watchdog?

There are 3 types of watchdog functions, Communication WDT, system WDT, FSV WDT. The firmware version A2.XXBXX, there is the 4th watchdog function, core task WDT. All 4 of them will be explained in detail in this document.

■ **Brief Solution - Step by Step:**

In the user manual "UM-WISE-4000-ED.4-EN.PDF", there is a paragraph about WDT, which is shown as the figure 1. There are 3 types of watchdog functions. The firmware version A2.XXBXX, there is the 4th watchdog function. All 4 of them will be explained in detail in this document.

Figure 1. Captured from user manual.

Table 1shows the relationship between firmware version and watchdog functions.

Table 1. LAN version of WISE-4000 series and watchdog relationship.

Model name	System WDT		Communication WDT				FSV WDT		Core task WDT	
Firmware version	vA1.xxBxx	vA2.xxBxx	vA113B06 Single TCP socket WDT	vA113B06 All TCP socket WDT	vA114B03 Single TCP socket WDT	vA114B03 All TCP socket WDT	vA1.xxBxx	vA2.xxBxx	vA1.xxBxx	vA2.xxBxx
WISE-4010/LAN	√	√	-	√	√	√	√	√	-	-
WISE-4050/LAN	√	√	-	√	√	√	√	√	-	-
WISE-4060/LAN	√	√	-	√	√	√	√	√	-	-
			vA1.xxBxx		vA2.xxBxx		vA1.xxBxx	vA2.xxBxx	vA1.xxBxx	vA2.xxBxx
WISE-4012	√	√	-	√	√	√	√	√	-	√
WISE-4012E	√	√	-	√	√	√	√	√	-	√
WISE-4050	√	√	-	√	√	√	√	√	-	√
WISE-4051	√	√	-	√	√	√	√	√	-	√
WISE-4060	√	√	-	√	√	√	√	√	-	√
	vA103B00	vA110B00	vA103B00		vA110B00		vA103B00	vA110B00	vA103B00	vA110B00
WISE-4220-SXX	√	√	-	√	-	√	√	√	-	-

System watchdog:

This watchdog is a hardware watchdog, which is implemented by IC ADM706x. The corresponding function block is pointed out in the figure 2 with red box. As you can see from the specification of the IC shown in figure 3, the triggered timing is 1.6 seconds. WISE firmware sends signal to the dog every 0.64 seconds by a subprogram. If the subprogram is hung-up for 1.6 seconds, then the IC will trigger the WISE module for rebooting. This event will not be recorded in system log due to the program is hanged.
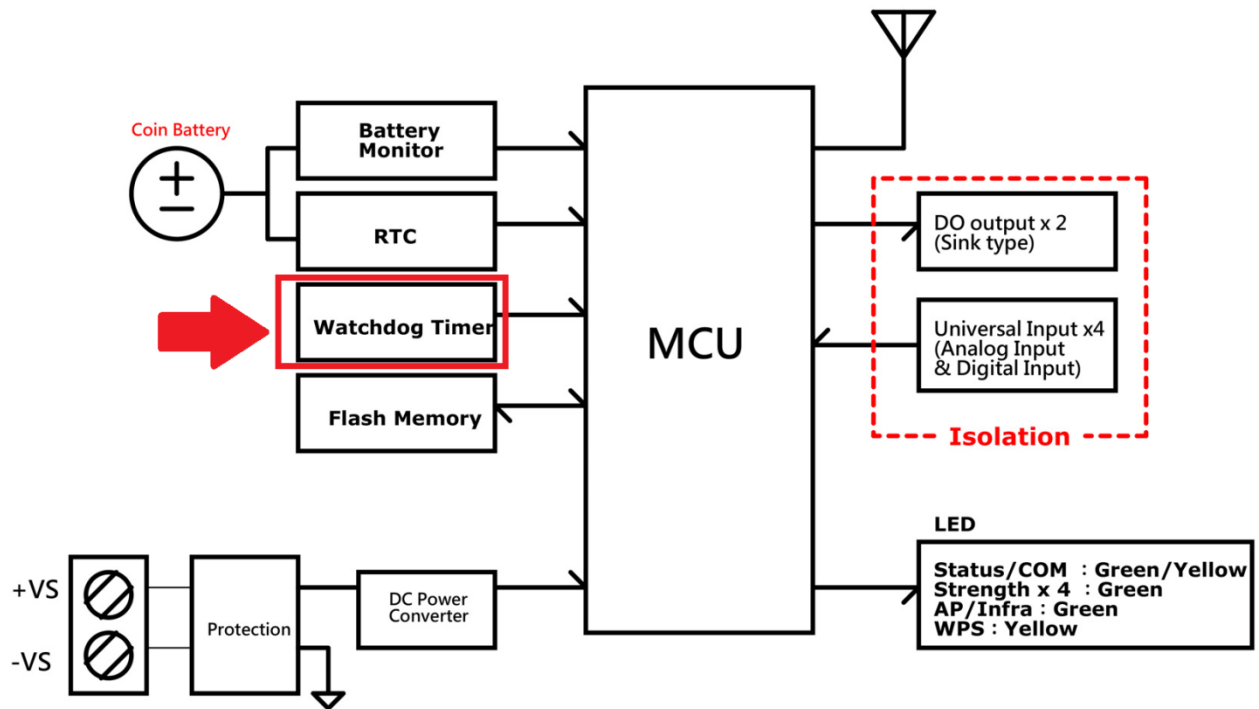
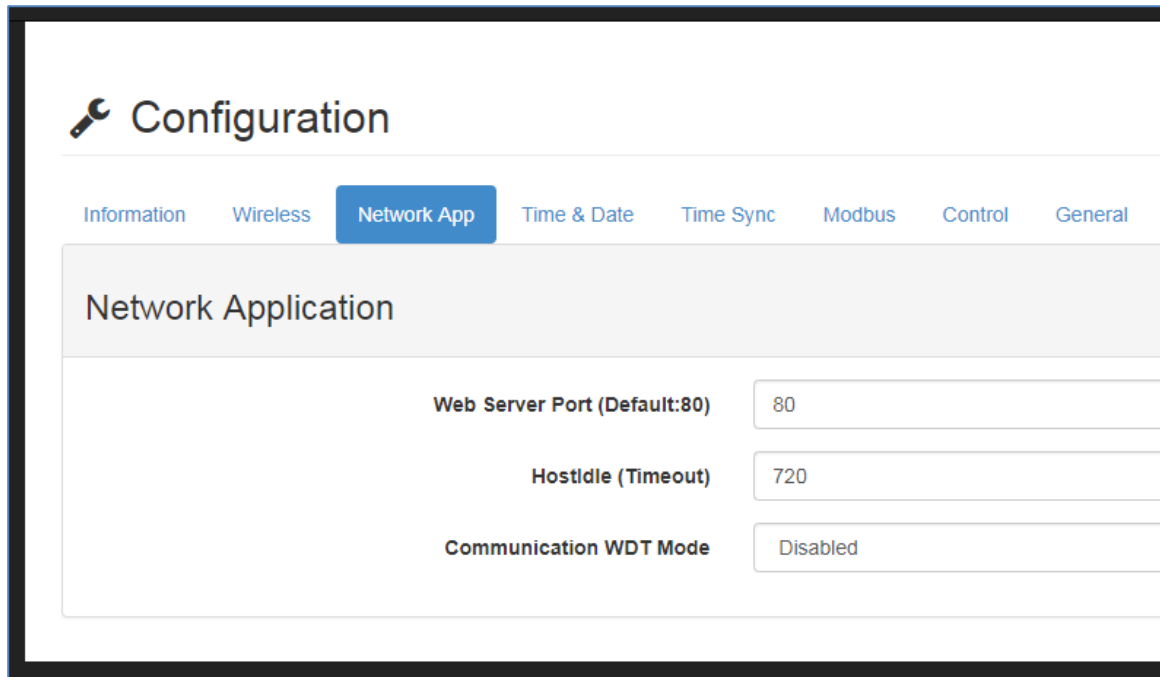Figure 2. Function block of WISE module captured from user manual.

Figure 3. Specification of watchdog timer IC captured from Internet.

Communication WDT

This watchdog is a firmware watchdog, which is implemented by a subprogram. The HostIdle time is set as 720 seconds as default number. This parameter can be modified by a user.

There are 2 kinds of communication WDT:

1. For all of TCP sockets connection.
   ✧ There will be an event "3 – communication WDT" in your system log.
2. For single TCP socket connection.
   ✧ Only version A2.XXBXX firmware supports this function. Please refer to the table 1.
   ✧ There will be an event "3 – communication WDT" in your system log.

Figure 4. HostIdle time and Communication WDT mode setting page.

Figure 5. Log I/O data while communication WDT is triggered setting page.

<u>For all of TCP sockets connection.</u>

This watchdog timer check the all of the TCP sockets connection, including RESTful command, SNTP, private server, Modbus TCP,…etc.

If all of the connections have no data/command transferring in/out within HostIdle period:

(1) The watchdog will be triggered.
(2) If FSV function is enabled, the corresponding action can be referred to the FSV WDT section below.
(3) If the log condition "by Communication WDT Log" is enabled, then the module will start to log I/O data according to the "period" interval until any of the socket connections start

to have input/output.

(4) There will be a system event "PE:3 – communication WDT" in the system log.

<u>For single TCP socket connection.</u>

This watchdog timer is for user connection. The timer checks each of the TCP socket connection with a server did not receive any request to the socket within HostIdle period:

(1) The watchdog will be triggered.

(2) The TCP socket will be closed by the firmware.

(3) If you logged-in to the module, the account information will be erased.

(4) There will be a system event "PE:3 – communication WDT" in your system log.

So, if a user wants to send again request command next time, no matter with "RESTful" or "Modbus TCP" command, need to re-build a TCP socket connection with the module.

FSV WDT

This watchdog is a firmware watchdog, which is implemented by a subprogram.
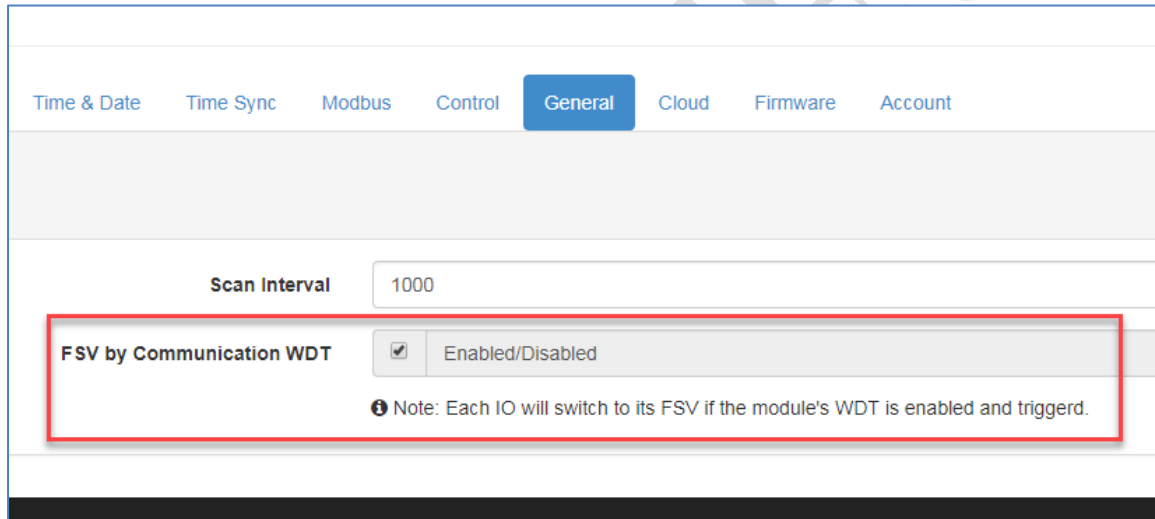

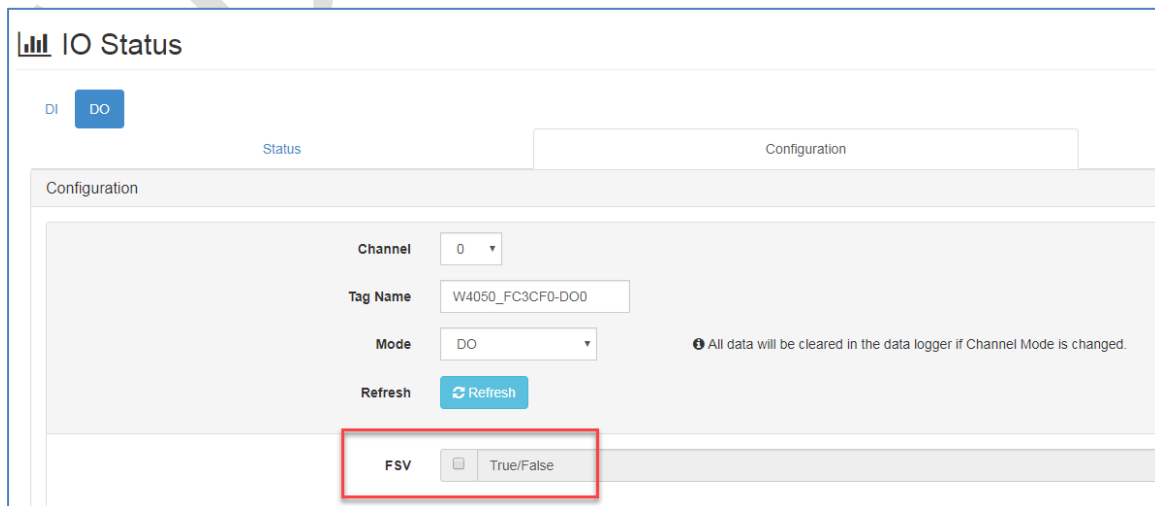Figure 5. FSV by Communication WDT mode setting page.

Figure 5. FSV of DO channel setting page.

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Situation1.

If a user enabled:

- ✓ "communication WDT mode"
- ✓ "FSV by communication WDT"
- ✓ DO "FSV Ture/False"

The firmware will check if all of the TCP sockets of a WISE module did not send-in/send-out any kind of data or command, then:

(1) Output channel will be set as logic high.

(2) There will be an event "3 – communication WDT" in your system log.

Situation2.

If a user enabled:

- ✓ "communication WDT mode"
- ✓ "FSV by communication WDT"
- ✗ DO "FSV Ture/False"

The firmware will check if all of the TCP sockets of a WISE module did not send-in/send-out any kind of data or command, then:

(1) Output channel will be set as logic low.

(2) There will be an event "PE:3 – communication WDT" in your system log.

Core task WDT

This watchdog function is supported by WISE-4000 Wi-Fi series with versionA2.XXBXX. Please refer to the table 1. There is an interrupt subprogram monitoring the main program every 10 seconds. If the main program is not responding the subprogram:

(1) The watchdog will be triggered.

(2) There will be a system log event "PE:7 – record 4: CoreTask WDT"

(3) The module will be rebooted.