JetCon 6300 Series User Manual

Configuration

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www.korenix.com

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Acknowledgments

Revision History

Version	Date	Revision Information
1.0	2008/7/10	Create

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1. Overview

The Korenix JetCon 6300 series is a smart Ethernet I/O converter with multiple digital input and digital output channels. JetCon 6300 converts the signal of each I/O channel into Ethernet messages. The input channels support either digital-input mode or event-counter mode, while the output channels provide digital-output mode or pulse-output mode. User can monitor the real-time status or control all the channels remotely through the built-in Ethernet connectivity.

In addition to remote data acquisition and channel control, JetCon 6300 is programmable with smart I/O rules. An event of logic rule can be defined to modify the status of digital output channel either on the same device or to multiple JetCon 6300 series devices. With the user defined logic rules, multiple JetCon 6300 devices can execute the programmed control logic without further step in by user or other controls.

The configuration is user friendly. The management interfaces include JetCon 6300 Commander, Web, and Modbus/TCP protocol which help use to integrate JetCon 6300 products into existing HMI/SCANA systems.

JetCon 6300 is constructed by aluminum case with IP31 protection for industrial environment and the Din-Rail mounting is easy to install in control box with limited spaces.

1.1. About This Manual

This manual provides detailed information for JetCon 6300 series software configuration, which includes JetCon 6300 Commander, Web Display and Modbus/TCP configuration.

2. JetCon 6300 Commander

JetCon 6300 Commander, which is shipped with JetCon 6300 products, provides a user-friendly management interface for real-time data acquisition and I/O channel control. Users can configure the logic I/O rules, network interface, and upgrade firmware through this tool as well.

2.1. Installation

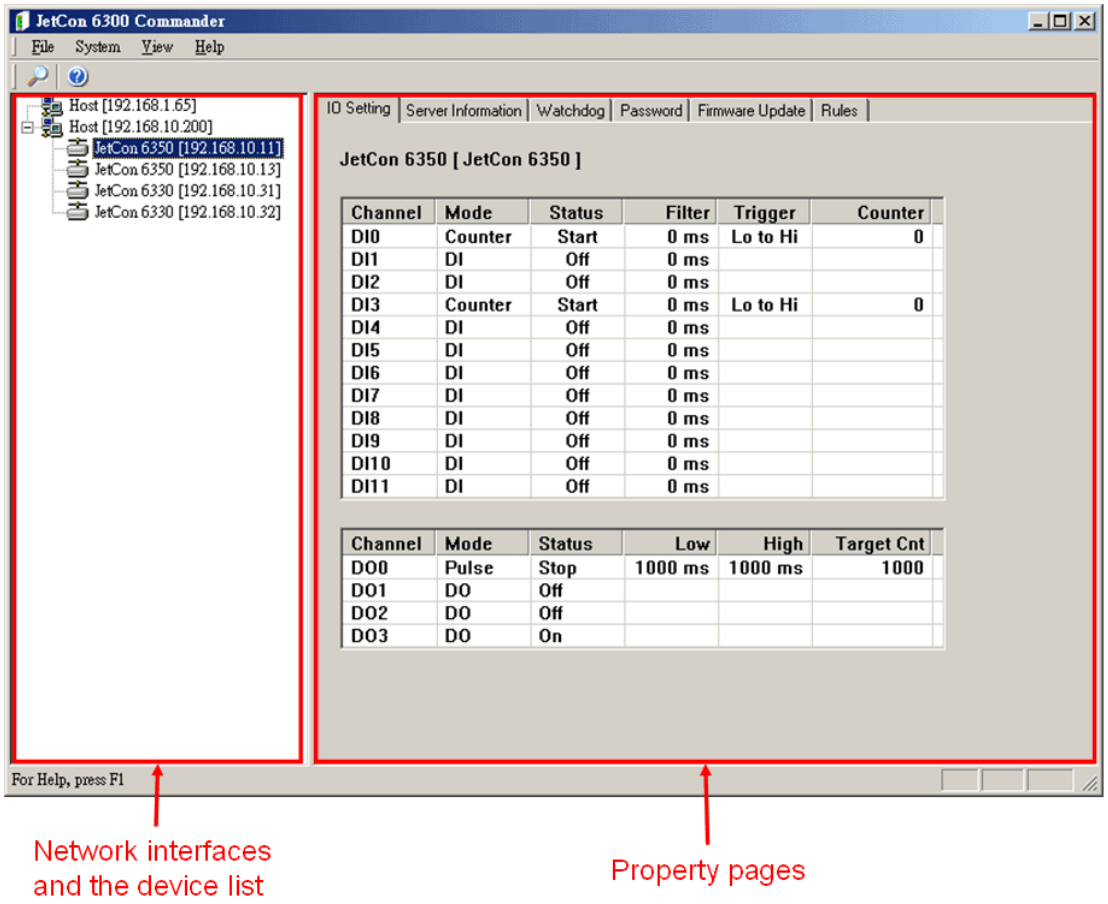
Install JetCon 6300 Commander from the documentation and software CD-ROM.

2.2. Functional List

The functionality of JetCon 6300 Commander includes:

- Search JetCon 6300 series devices on the same physical LAN
- Edit device information and device network configuration
- Configure the operating mode of each channel
- Real-time data acquisition and channel control
- Edit I/O rules
- Firmware upgrade
- Firmware rescue

As shown in Picture 1, the left side of JetCon 6300 Commander lists all the network interfaces and the JetCon 6300 devices found on the corresponding interface. At the right side, there are property pages on which you read the information and configure the settings of the selected device. The property pages include I/O setting, Server Information, Safe Mode, Password, Firmware Upgrade and Rules.



Picture 1 The appearance of JetCon 6300 Commander

2.3. Search for Devices

JetCon 6300 Commander helps you search JetCon 6300 devices on the same physical LAN. JetCon 6300 Commander searches for devices when it launches.

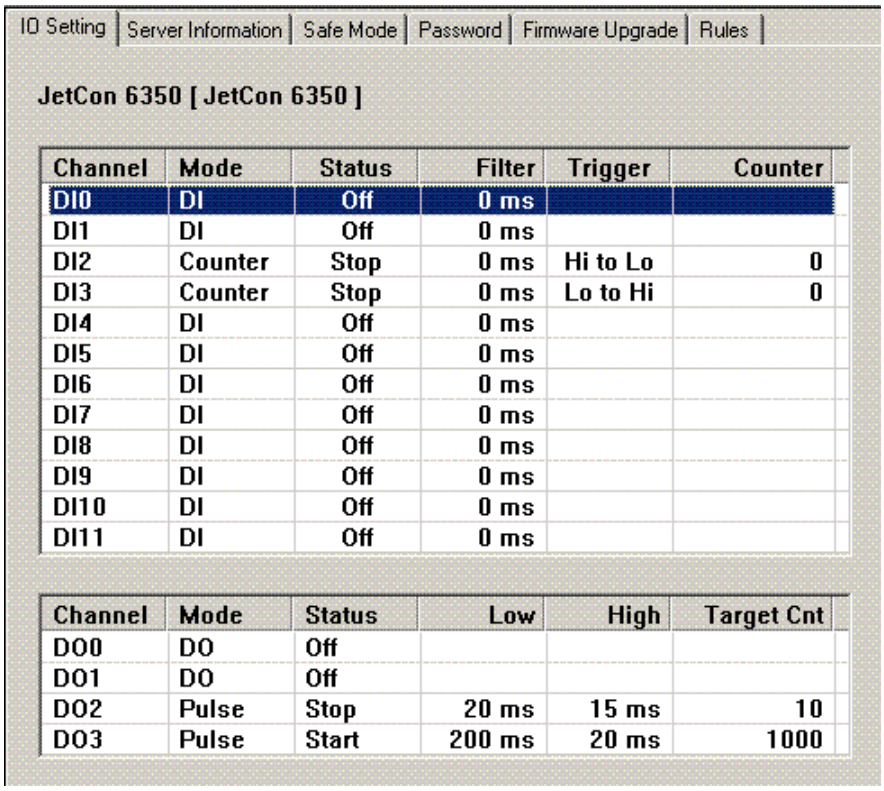
You can either press  on the tool bar or select "System→Search" to start the searching process. Any found devices will be listed in the left side. Select one of them, the device information and settings can be configured on the property pages at the right side.

Note: JetCon 6300 Commander can discover two devices with the same IP address, however, it can not configure them at the same time. If there is more than one with the same IP address found, for example, the default IP address when the first time you use them. Please off-link one of the conflict devices and change the IP settings of each device one by one.

2.4. I/O Configuration

As shown in Picture 2, you can read the summary of configuration and the real-time status of the DI/DO channels. The meaning of each column is detailed as below Table 1 and Table 2.

While the DI channels support two operating modes: DI or Counter, the DO channels can operate in either DO or Pulse mode. Double click on the channel for further configurations. You will be asked for the password before making changes to the configuration.



Picture 2 Property Pages

Column	Description	Value
Channel	The channel identifier. There will be a '*' symbol after the identifier if the channel is configured with a logic rule.	DIn(*)
Mode	In which mode the DI channel operates.	DI/Counter
Status	The real-time status of the channel.	DI mode: On/Off Counter mode: Start/Stop
Filter	The minimum duration of a DI change continues to alternate the status of the channel.	0~65,535 ms

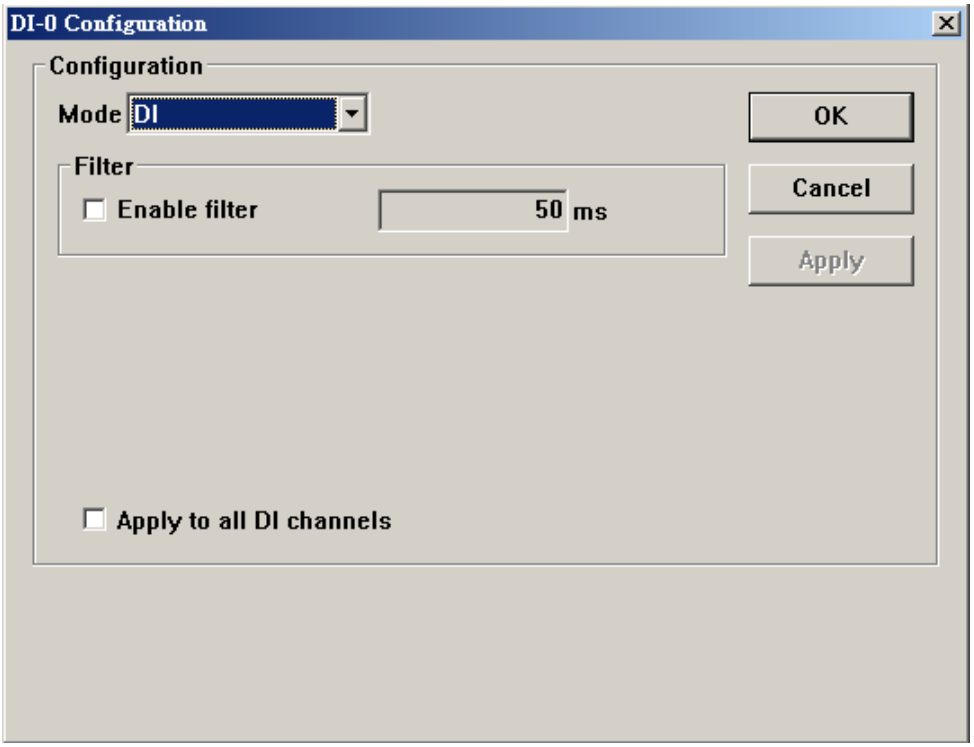
Trigger	The condition triggers the counter.	Lo to Hi /Hi to Lo (Counter mode only)
Counter	The number of times that the counter has counted	(Counter mode only)

Table 1 Summary of the DI Channel Table

Column	Description	Value
Channel	The channel identifier. There will be a '*' symbol after the identifier if the channel is configured with a logic rule.	DOn(*)
Mode	In which mode the DO channel operates.	DO/Pulse
Status	The real-time status of the channel.	DO mode: On/Off Pulse mode: Start/Stop
Low	The duration a pulse continues at Low	0~65,535 ms
High	The duration a pulse continues at High	0~65,535 ms
Target Cnt	The target number of pulse signal sent by the pulse output	0~2,000,000,000

Table 2 Summary of the DO Channel Table

2.4.1. DI Mode



Picture 3 Configuration for DI Mode of DI Channels

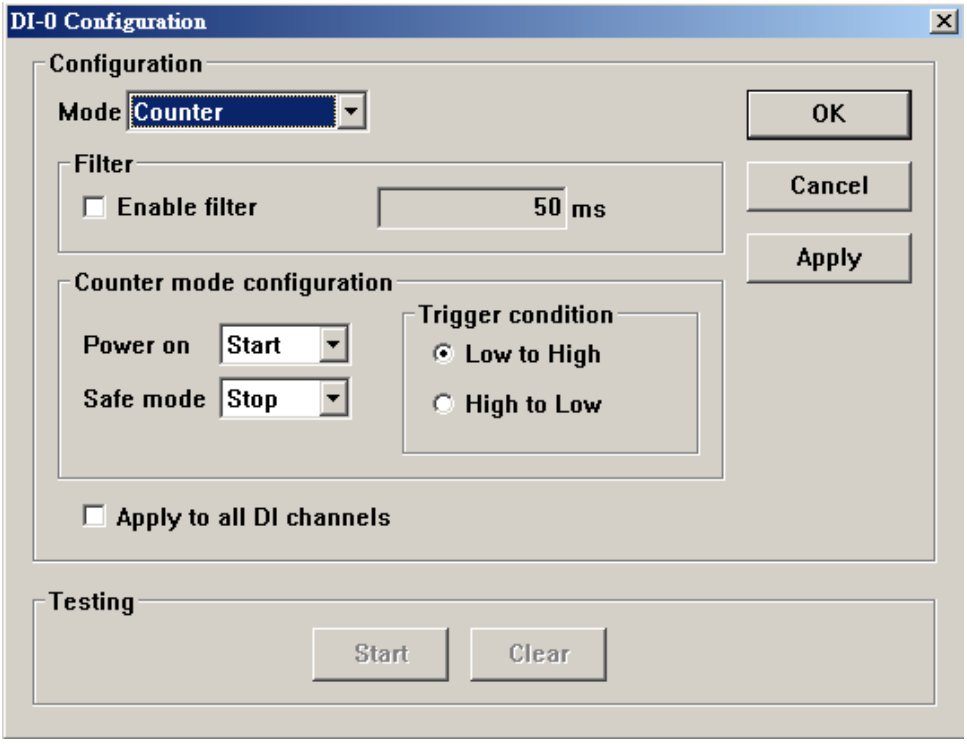
In the DI setting window, choose the operating mode in "**Mode**" option, either "**DI**" or "**Counter**".

In DI mode, the channel monitors the status of the digital input. If the input voltage is higher than the threshold, the status is ON. Else, the status is OFF.

Enabling the "**Filter**" helps filter out a sudden input change for a specific duration, which ranges from 1 to 65535 ms. The channel reports status change only when the change continues longer than the filter duration.

Check "**Apply to all DI Channels**" to set all the other DI channels work in the same manner at once.

2.4.2. Counter Mode



Picture 4 Setting for Counter Mode of DI Channels

In Counter mode, the channel counts the number of the status changes, either "**Low to High**" or "**High to Low**". The maximum count is up to 4,294,967,295 times.

Configure the "**Power On (start/stop)**" status of the counter to determine if the counter should start or stop after each time the device reboots.

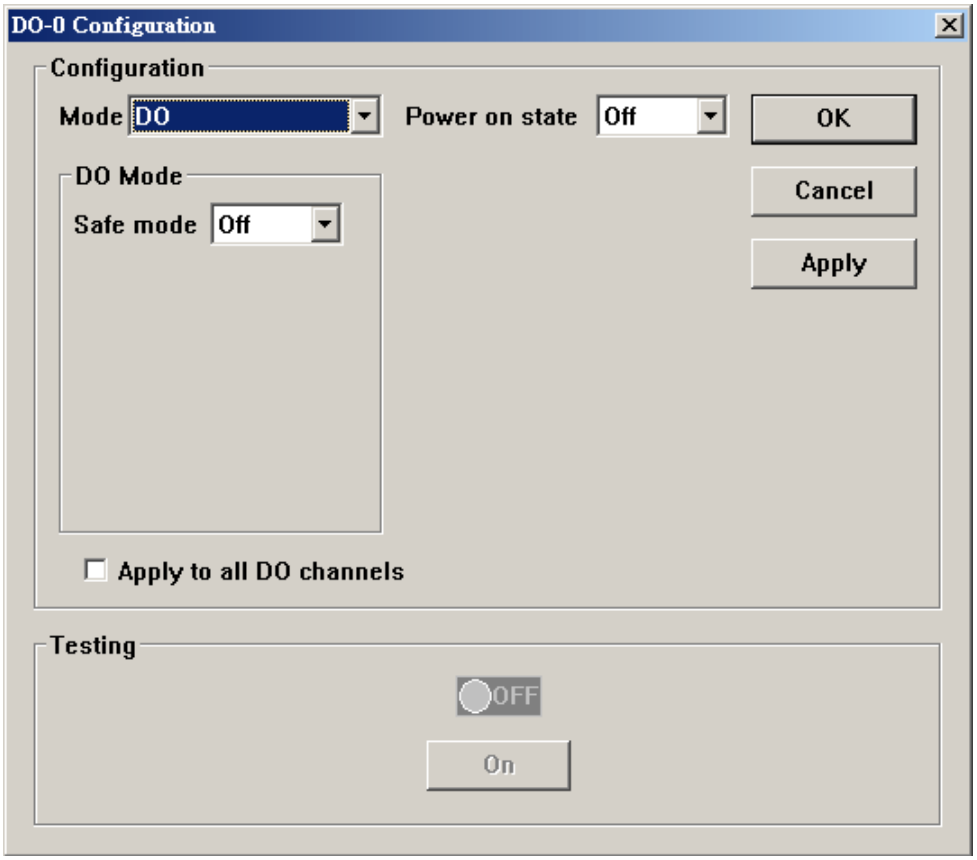
Choose the "**Safe Mode (start/stop)**" status determines the behavior of the counter, when the device misses network connection for a period of time and enters safe mode.

"**Trigger Condition**" determines for what circumstances a counter counts, either when the input signal is changing from "**Low to High**" or "**High to Low**".

Check "**Apply to all DI Channels**" to set all the other DI channels work in the same manner at once.

Press "**Apply**" to set the modification to the device. In the Testing column, press "**Start/Stop**" to start/stop the counter immediately and press "**Clear**" to reset the count value to 0.

2.4.3. DO Mode



Picture 5 Setting for DO Mode of DO channels

In the DO setting window, choose the operating mode in "**Mode**" option, either DO or Pulse.

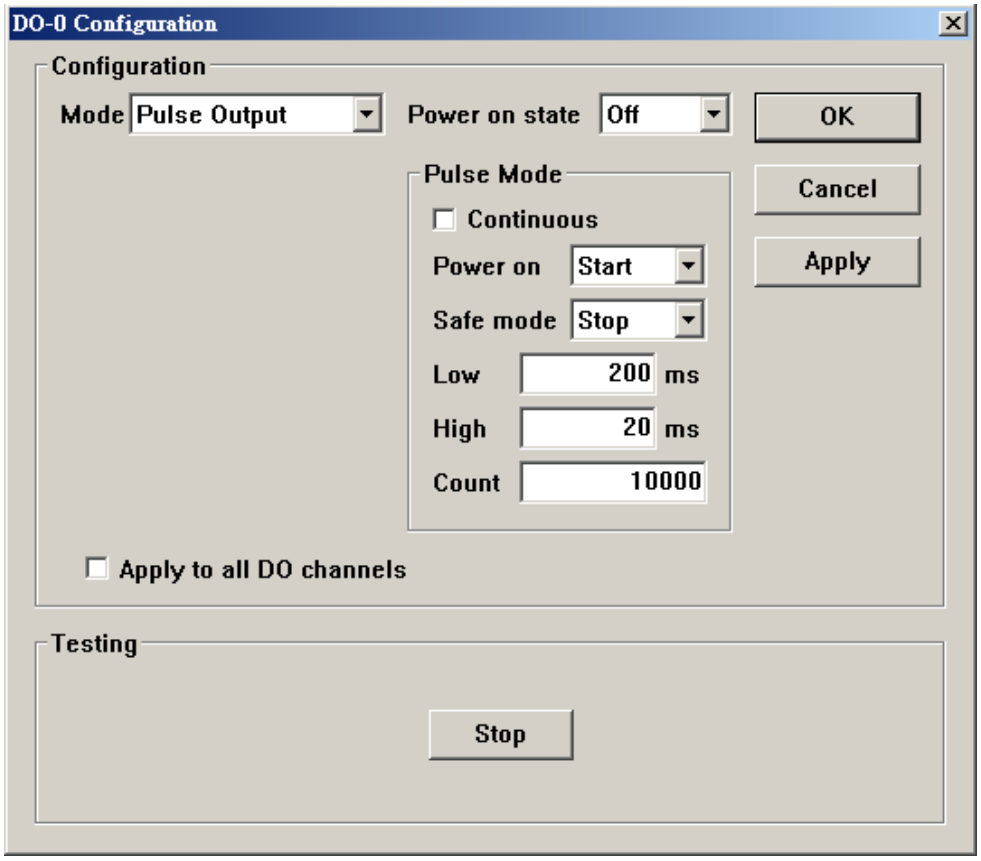
In DO mode, configure the "**Power On state (On/ Off)**" to determine if the state of the DO channel should be On or Off each time the device reboots.

Choose the "**Safe Mode (On/Off)**" to determine the behavior of the DO channel when the device loses network connection for a period of time and enters safe mode.

Check "**Apply to all DI Channels**" to set all the other DI channels work in the same manner at once.

Press "**Apply**" to program the modification to the device. In the Testing column, press "**On/Off**" to control the real-time state of a DO channel.

2.4.4. Pulse Mode



Picture 6 Setting for Pulse Mode of DO Channels

In Pulse mode, configure the "**Power On state (On/Off)**" to determine if the initial state of the pulse should be On or Off each time the device reboots. "**Continuous**" determines if the output channel sends pulse signal continuously.

Configure the "**Power On (start/stop)**" status to determine if the pulse should start or stop each time when the device powers on.

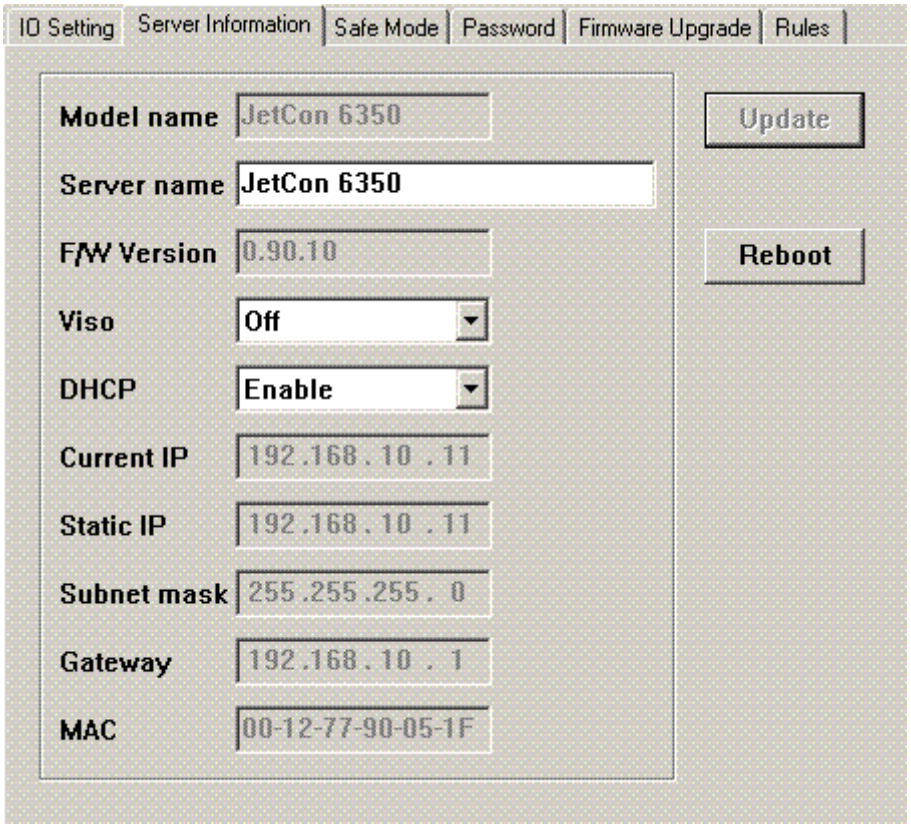
Choose the "**Safe Mode (Start/Stop)**" to determine the behavior of the pulse output when the device loses network connection for a period of time and enters safe mode.

The "**Low**" value determines the duration a pulse stays in Low state, while the "**High**" value determines the duration a pulse stays in High state. The duration ranges from 1 to 65,535 ms.

"**Count**" determines the number of pulse, from 1 to 2,000,000,000, when the pulse starts.

Press "**Apply**" to program the modification to the device. In the Testing column, press "**Start/Stop**" to test your pulse setting immediately.

2.5. Server Information



Picture 7 Property Page of Server Information

Server information includes device identity and network configurations.

Model Name identifies which model this device is.

Server Name a user defined character string which helps distinguish the device. The maximum length is 30 characters.

F/W Version is the firmware version the device runs currently.

V_{iso} turns on/off the internal isolated voltage of I/O interfaces. The relationship of V_{iso} state, DI/DO wiring and the result of channel is summarized below:

	V_{iso} = ON		V_{iso} = OFF	
	ON State	OFF State	ON State	OFF State
DI Dry Contact	SW=Close to GND	SW=Open	N/A	N/A
DI Wet Contact	Vt= 3.5 ~ 30Vdc and SW=Close	SW=Open or Vt< 3Vdc	Vt=3.5 ~ 30Vdc and SW=Close	SW=Open or Vt< 3Vdc
DO	Load with Vt, 200mA max	Load without current	Load with Vt (Vt>=4Vdc), 200mA	Load without current

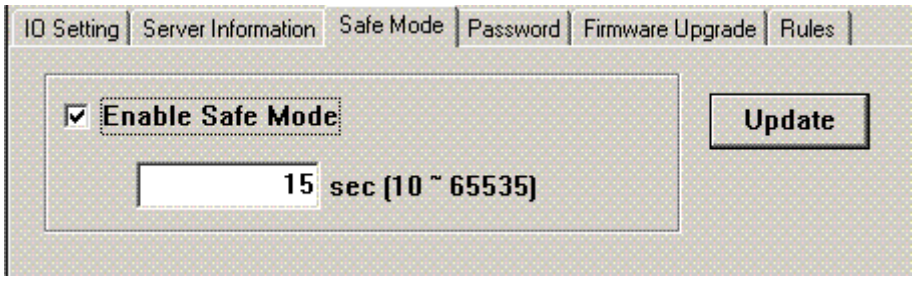
DHCP determines if the device gets IP address dynamically from a DHCP server.

Note: JetCon 6300 does not regain or extend the period of validity request before deadline.

Current IP displays the IP setting of the device.
Static IP assign a fixed IP address to the device manually.
Subnet mask the subnet mask of the static IP configuration.
Gateway the gateway IP address of the static IP configuration.
MAC the MAC address of the device.

Please press "**Update**" to write new setting to the device. You need to restart the device to enable the new setting by click the "**Reboot**" button.

2.6. Safe Mode

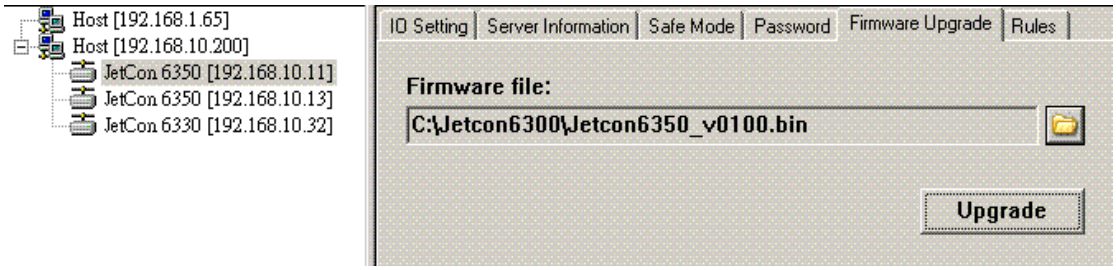


Picture 8 Watchdog Configuration

JetCon 6300 series supports Safe Mode if its network link is lost for a period of time. The behavior of each DI/DO channel in Safe Mode can be configured in DI/DO configuration window (please refer to section 2.4.2, 2.4.3, 2.4.4). A timer counts the duration of network missing. JetCon 6300 enters Safe Mode when the timer times out.

Safe Mode configuration enables/disables Safe Mode operation and specifies how long the timer inspects for network missing.

2.7. Firmware Upgrade



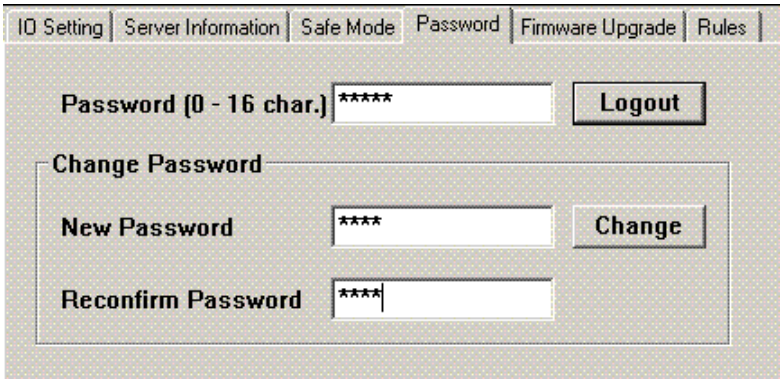
Picture 9 Firmware Upgrade

Select correct firmware file and press the "**Update**" button. During the upgrade process is proceeding, the RDY LED turns off. If procedure finishes successfully, the device reboots and goes back to ready state with the RDY LED lighting on.

For a secure upgrade, the procedure will retry for 3 timers if there is any unexpected situation.

2.8. Password

JetCon 6300 series supports password security. Users are required to enter the password before making any modifications. The default password is "admin" and can be changed in the "**Change Password**". An empty string is equivalent to disable the password security.

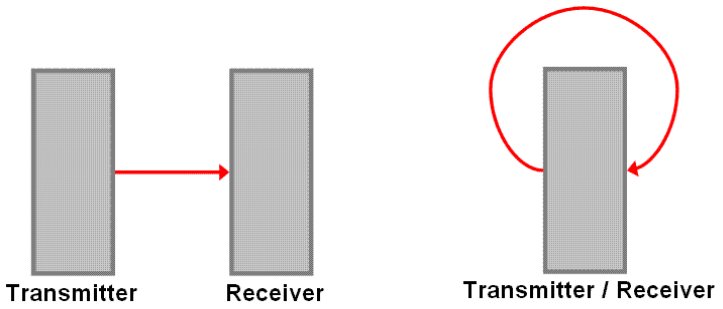


Picture 10 Password Security and Password Configuration

2.9. Logic Rules

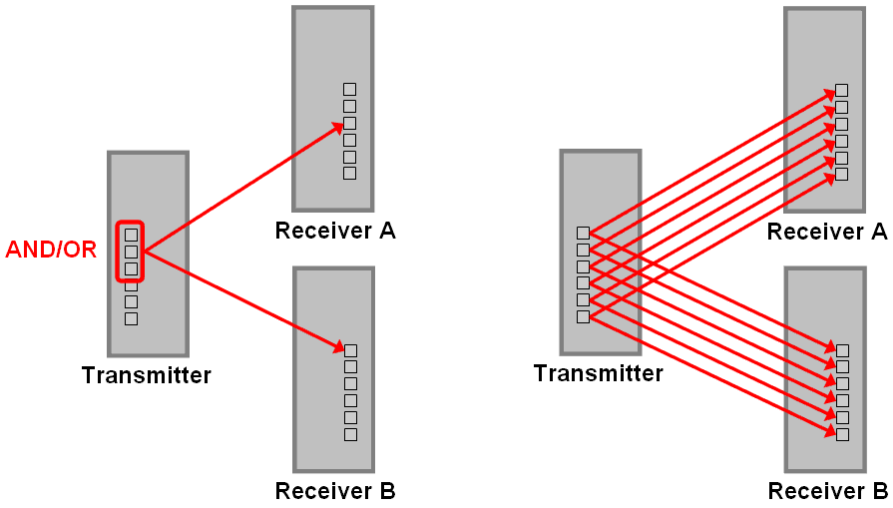
JetCon 6300 series supports logic rules. A logic rule defines a condition and how a device reacts when the condition meets. With the programmed rules, JetCon 6300 series can response to I/O events without manual management.

As shown in Picture 11, a rule defines either the interaction among different devices, or the interaction between different channels on a device itself. A device (channel) that sends events is called a Transmitter. A device (channel) that receives and reacts to the event is called a Receiver. The events are sent between devices through the Ethernet.



Picture 11 I/O rules interacts between devices or a device itself

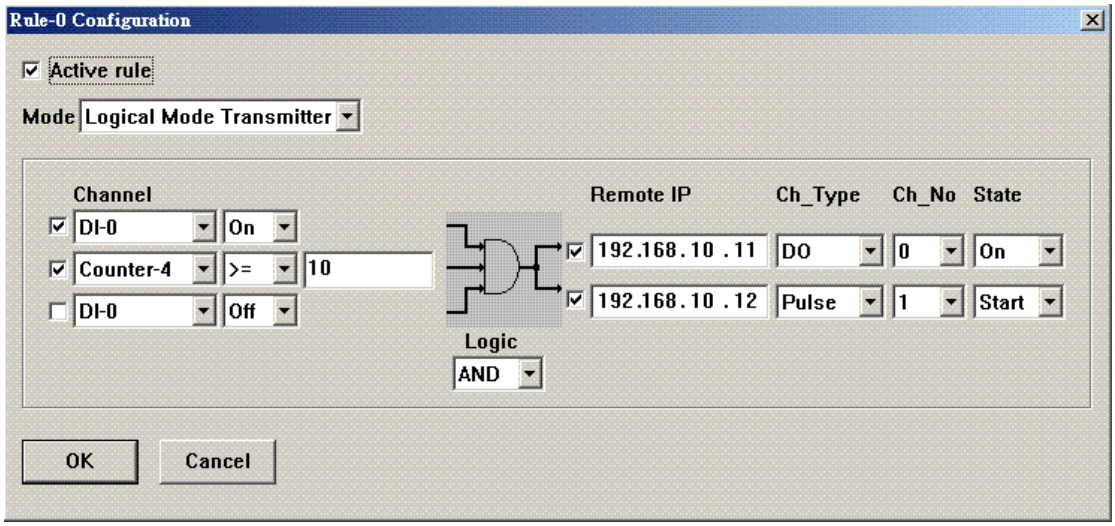
Two modes of rules can be defined, logic mode and Peer-to-Peer (P2P) mode. While logical mode combines a AND, OR logic relationship among I/O channel status, P2P mode maps the status of each I/O channels to the peers directly. The concept of logic mode and P2P mode is shown in Picture 12.



Picture 12 Logic Mode and P2P Mode

A device can be configured up to 16 rules with logic mode and P2P mode mixed, Transmitter and Receiver mixed. The "**Rules**" property page lists and summarizes the current setting of rules.

Double click on one of the listed rule to open the Rule Configuration window.



Picture 13 Rule Configuration

Active rule enable/disable this rule

Mode select the operating mode:

Logic Mode Transmitter

Logic Mode Receiver

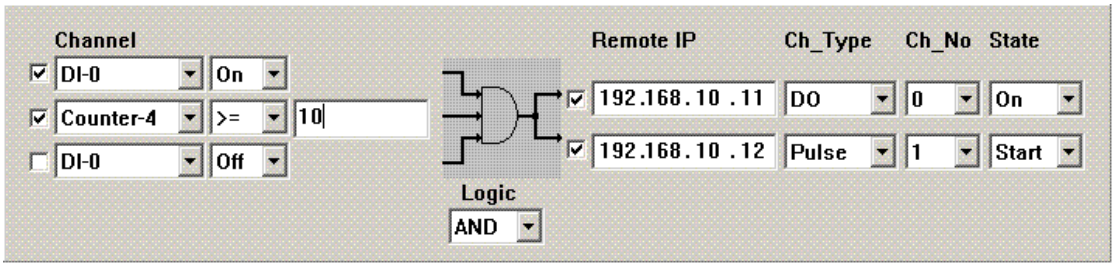
P2P Mode Transmitter

P2P Mode Receiver

The detailed settings for each mode are described below:

2.9.1. Logic Mode Transmitter

In logic mode, there is a logic rule defining a logic relationship among input channels of the Transmitter. If the result of logic AND/OR rule is true, the Transmitter sends an event notification to the Receiver. If the result is false, it does nothing to reduce the network traffic. There is an interval of 20 ms between each transmission from the Transmitter to a Receiver. The worst case of transmission interval is 640 ms (16 rules x 2 IP x 20 ms).



Picture 14 Configuration for Logic Mode Transmitter

Channel Configure the trigger of a rule. A logic rule can take into account the condition of up to 3 input channels and the channel can either operate in DI mode or Counter mode. Conditions are **On**, **Off** for DI mode, and **>=**, **=**, **<=**, **>**, **<** for Counter mode.

Logic Configure the logic relationship among the input channel conditions, either **AND** or **OR**. If the logic result is true, the Transmitter sends the event to the assigned Remote IP.

Remote IP The Receiver IP address. Up to two Receivers can be assigned, and each of them can have its own reaction. Check the checkbox in front of the IP address to active the configuration.

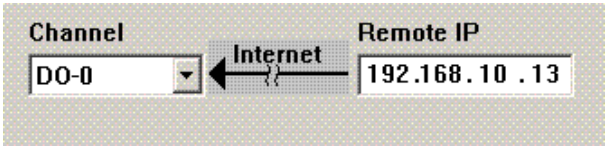
Ch_Type the Receiver's output channel which reacts to Transmitter's notification. The channel type can be either **DO** mode or **Pulse** mode.

Ch_No The id of the Receiver's output channel reacts to the event.

State The result of the Receiver output channel, such as to turn **On**/**Off** a DO or to **Start**/**Stop** a Pulse.

2.9.2. Logic Mode Receiver

The Receiver receives event notification from the Transmitter and determines which output channel reacts.



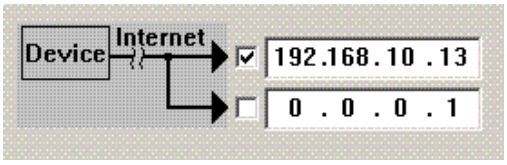
Picture 15 Configuration for Logic Mode Receiver

Channel The output channel reacts to the event from Transmitter. It can operate in either DO mode or Pulse mode.

Remote IP The Transmitter's IP address.

2.9.3. P2P Mode Transmitter

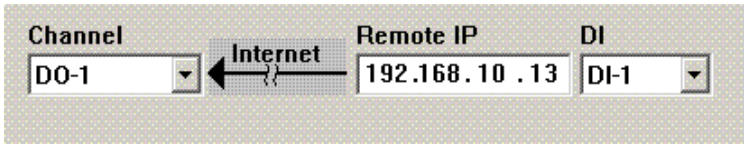
In P2P mode, the Transmitter sends the real-time status of all its input channels to the Receivers periodically. The Receiver then maps the received status of the Transmitter's input channel to its output channel. User can determine which input channel of the Transmitter maps to which output channel of the Receiver.



Picture 16

Remote IP The Receiver's IP address. A P2P Transmitter can send to up to two Receivers. Check the checkbox in front of the IP address to active the configuration.

2.9.4. P2P Mode Receiver



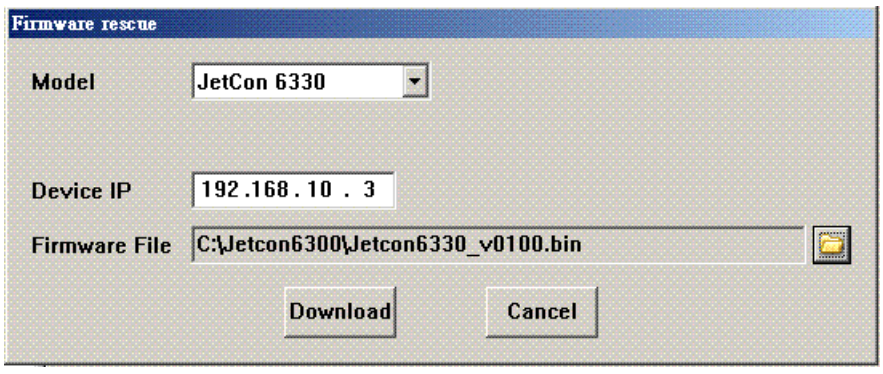
Picture 17

Channel The output channel which changes its status according to the state of appointed input channel of the Transmitter.

Remote IP The Transmitter's IP address.

DI The input channel of Transmitter which status the appointed Receiver's output channel changes with.

2.10. Firmware Rescue



Picture 18 Firmware Rescue

JetCon 6300 Series supports firmware rescue. JetCon 6300 devices will not enter ready state if its firmware crashes accidentally. Under such circumstance, only the PWR LED is on and the RDY LED if off, please try Firmware Rescue to recover the device.

When the firmware crashes, JetCon 6300 runs BootP engine which tries to get an IP address and download new firmware. The BootP process will not stop

when the device is powered on. Use Firmware Rescue to provide the device an IP address and the new firmware.

Model	the model name of the device.
Device IP	the IP address given to the device.
Firmware File	the firmware file.

3. Modbus/TCP Configuration

JetCon 6300 series supports Modbus/TCP configuration. By making use of Modbus/TCP, you can integrate JetCon 6300 devices into your existing HMI/SCADA system.

The features supported by Modbus/TCP include:

- Digital Input channel operating mode
- DI mode monitoring
- Counter mode monitoring and configuration
- Filter configuration
- Digital Output operating mode
- DO mode monitoring and control
- Pulse mode configuration
- Reboot device

Please refer to appendix for detail register definitions for each JetCon 6300 model.

4. Web Display

JetCon 6300 supports Web display. You can access the embedded web page of JetCon 6300 by connecting the web browser to the IP address of the device. Server Information, network and channel configuration, and real-time channel status can be monitored through the web browser.

You are asked to enter the password if the device is password-security enabled.

Note: If the password is changed, please clear the cached cookie files before login the web display page.

5. Further Support

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Appendix A. JetCon 6330 Modbus Command Sets and Registers

A.1 Function Code 0x01, 0x05, 0x0F Protocols

A.1.1 Function Code 0x01: Read Coils

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x01
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Coils	2	0x0001 ~ 0x7D0 (1~2000)
Response	Function Code	1	0x01
	Byte count	1	N(1)
	Coil Status	n(2)	
Error	Function Code	1	0x81
	Exception Code	1	0x01: Illegal Function
			0x02: Illegal Data Address
			0x03: Illegal Data Value
			0x04: Slave Device Failure

(1) N = Quantity of ouput/8, if the remainder is not 0, N = N + 1

(2) n = N or N + 1

A.1.2 Function Code 0x05: Write Single Coil

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x05
	Output Address	2	0x0000 ~ 0xFFFF
	Output Value	2	0x0000(off), 0xFF00(on)
Response	Function Code	1	0x05
	Output Address	2	0x0000 ~ 0xFFFF
	Output Value	2	0x0000(off), 0xFF00(on)
			A value of FF 00 hex

			requests the coil to be ON. A value of 00 00 requests it to be OFF. All other values are illegal and will not affect the coil.
Error	Function Code	1	0x85
	Exception Code	1	0x01 0x02 0x03 0x04

A.1.3 Function Code 0x0F: Write Multiple Coils

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x0F
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Outputs	2	0x0001 ~ 0x07B0
	Byte Count	1	N(1)
	Output Value	1 x N	The reguested ON/OFF states are specified by contents of the query data field. A logical '1' in a bit position of the field requests the corresponding coil to be ON. A logical '0' requests it to be OFF.
Response	Function Code	1	0x0F
	Output Address	2	0x0000 ~ 0xFFFF
	Output Value	2	0x0001 ~ 0x07B0
Error	Function Code	1	0x8F
	Exception Code	1	0x01 0x02 0x03 0x04

(1) N = Quantity of Outputs / 8. If the remainder is not 0, N = N + 1

A.1.4 Register Definitions

A.1.4.1 Counter Status

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	1 bit	Counter Status (0: Off, 1: On)	RW
0x0001	1			
0x0002	2			
0x0003	3			
0x0004	4			
0x0005	5			
0x0006	6			
0x0007	7			
0x0008	8		same as above	
0x0009	9			
0x000A	10			
0x000B	11			
0x000C	12			
0x000D	13			
0x000E	14			
0x000F	15			

A.1.4.2 Clear Counter Value

Protocol Address	Channel	Data Type	Description	Access
0x0010	0	1 bit	0: N/A 1: Clear Counter Value	RW
0x0011	1		same as above	
0x0012	2			
0x0013	3			
0x0014	4			
0x0015	5			
0x0016	6			

0x0017	7	
0x0018	8	
0x0019	9	
0x001A	10	
0x001B	11	
0x001C	12	
0x001D	13	
0x001E	14	
0x001F	15	

A.1.4.3 Counter Overflow Status

Protocol Address	Channel	Data Type	Description	Access
0x0020	0	1 bit	Read 0: Normal 1: Overflow Write 0: Clear Overflow Status 1: N/A	RW
0x0021	1			
0x0022	2			
0x0023	3			
0x0024	4			
0x0025	5			
0x0026	6			
0x0027	7			
0x0028	8		same as above	
0x0029	9			
0x002A	10			
0x002B	11			
0x002C	12			
0x002D	13			
0x002E	14			
0x002F	15			

A.1.4.4 Counter Trigger

Protocol Address	Channel	Data Type	Description	Access
0x0030	0	1 bit	Counter Trigger 0: Low to High (Off to On) 1: High to Low (On to Off)	RW
0x0031	1	same as above		
0x0032	2			
0x0033	3			
0x0034	4			
0x0035	5			
0x0036	6			
0x0037	7			
0x0038	8			
0x0039	9			
0x003A	10			
0x003B	11			
0x003C	12			
0x003D	13			
0x003E	14			
0x003F	15			

A.1.4.5 Counter Power-On Status

Protocol Address	Channel	Data Type	Description	Access
0x0040	0	1 bit	Counter Power-On Status 0: Stop 1: Start	RW
0x0041	1	same as above		
0x0042	2			
0x0043	3			
0x0044	4			
0x0045	5			
0x0046	6			

0x0047	7	
0x0048	8	
0x0049	9	
0x004A	10	
0x004B	11	
0x004C	12	
0x004D	13	
0x004E	14	
0x004F	15	

A.1.4.6 Counter Safe Mode Status

Protocol Address	Channel	Data Type	Description	Access
0x0050	0	1 bit	Counter Safe Mode Status 0: Stop 1: Start	RW
0x0051	1			
0x0052	2			
0x0053	3			
0x0054	4			
0x0055	5			
0x0056	6			
0x0057	7			
0x0058	8		same as above	
0x0059	9			
0x005A	10			
0x005B	11			
0x005C	12			
0x005D	13			
0x005E	14			
0x005F	15			

A.1.4.7 Filter Status

Protocol Address	Channel	Data Type	Description	Access

0x0060	0	1 bit	Filter Status 0: Off 1: On	RW
0x0061	1	same as above		
0x0062	2			
0x0063	3			
0x0064	4			
0x0065	5			
0x0066	6			
0x0067	7			
0x0068	8			
0x0069	9			
0x006A	10			
0x006B	11			
0x006C	12			
0x006D	13			
0x006E	14			
0x006F	15			

A.1.4.8 Reboot Device

Protocol Address	Data Type	Description	Access
0x0070	1 bit	1: reboot device	RW

A.1.4.9 Reserved

0x0071 ~ 0x00FF Reserved
0x0100 ~ 0x07CF N/A

A.2 Function Code 0x02 Protocol

A.2.1 Function Code 0x02: Read Discrete Inputs

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x02

	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Input	2	0x0001 ~ 0x07D0 (1~2000)
Response	Function Code	1	0x02
	Starting Address	1	N(1)
	Input Registers	1 x N	
Error	Function Code	1	0x82
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Inputs / 8. If the remainder is not 0, N = N + 1

A.2.2 Register Definition

A.2.2.1 DI Value

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	1 bit	DI Value	R
0x0001	1			
0x0002	2			
0x0003	3			
0x0004	4			
0x0005	5			
0x0006	6			
0x0007	7			
0x0008	8		same as above	
0x0009	9			
0x000A	10			
0x000B	11			
0x000C	12			
0x000D	13			
0x000E	14			
0x000F	15			

A.2.2.2 Reserved

0x0010 ~ 0x00FF Reserved
0x0100 ~ 0x07CF N/A

A.3 Function Code 0x03, 0x06, 0x10 Protocols

A.3.1 Function Code 0x03: Read Holding Register

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x03
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Register	2	0x0001 ~ 0x007D (1~125)
Response	Function Code	1	0x03
	Byte Count	1	2 x N(1)
	Registers Value	2 x N	
Error	Function Code	1	0x83
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Inputs Registers

A.3.2 Function Code 0x06: Write Single Register

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x06
	Register Address	2	0x0000 ~ 0xFFFF
	Register Value	2	0x0000 ~ 0xFFFF
Response	Function Code	1	0x06
	Register Address	2	0x0000 ~ 0xFFFF
	Register Value	2	0x0000 ~ 0xFFFF
Error	Function Code	1	0x86
	Exception Code	1	0x01
			0x02
			0x03

	0x04

A.3.3 Function Code 0x10: Write Multiple Registers

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x10
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Registers	2	0x0001 ~ 0x0078
	Byte Count	1	2 x N(1)
	Register Value	2 x N	
Response	Function Code	1	0x10
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Registers	2	0x01 ~ 0x7B (1~23)
Error	Function Code	1	0x90
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Registers

A.3.4 Register Definition

A.3.4.1 Filter Timer

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	Word	Filter Timer 1 ~ 65535 ms	RW
0x0001	1	same as above		
0x0002	2			
0x0003	3			
0x0004	4			
0x0005	5			
0x0006	6			
0x0007	7			
0x0008	8			
0x0009	9			

0x000A	10	
0x000B	11	
0x000C	12	
0x000D	13	
0x000E	14	
0x000F	15	

A.3.4.2 Digital Input Operating Mode

Protocol Address	Channel	Data Type	Description	Access
0x0010	0	Word	DI Operating Mode 0x0000: DI 0x0001: Counter 0x0001 ~ 0xFFFF: Reserved Changing DI operating mode will also clear the Counter Value.	RW
0x0011	1			
0x0012	2			
0x0013	3			
0x0014	4			
0x0015	5			
0x0016	6			
0x0017	7			
0x0018	8		same as above	
0x0019	9			
0x001A	10			
0x001B	11			
0x001C	12			
0x001D	13			
0x001E	14			
0x001F	15			

A.4 Function Code 0x04 Protocol

A.4.1 Function Code 0x04: Read Input Register

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x04
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Registers	2	0x0001 ~ 0x007D (1~125)
Response	Function Code	1	0x04
	Byte Count	1	2 x N(1)
	Registers Value	2 x N	
Error	Function Code	1	0x84
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Input Registers

A.4.2 Register Definition

A.4.2.1 Counter Value

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	Word	Counter Value (High Word)	RO
0x0001	0	Word	Counter Value (Low Word)	RO
0x0002	1	same as above		
0x0003	1			
0x0004	2			
0x0005	2			
0x0006	3			
0x0007	3			
0x0008	4			
0x0009	4			

0x000A	5	
0x000B	5	
0x000C	6	
0x000D	6	
0x000E	7	
0x000F	7	
0x0010	8	
0x0011	8	
0x0012	9	
0x0013	9	
0x0014	10	
0x0015	10	
0x0016	11	
0x0017	11	
0x0018	12	
0x0019	12	
0x001A	13	
0x001B	13	
0x001C	14	
0x001D	14	
0x001E	15	
0x001F	15	

Appendix B. JetCon 6350 Modbus Command Sets and Registers

B.1 Function Code 0x01, 0x05, 0x0F Protocols

B.1.1 Function Code 0x01: Read Coils

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x01
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Coils	2	0x0001 ~ 0x7D0
Response	Function Code	1	0x01
	Byte count	1	N(1)
	Coil Status	n(2)	
Error	Function Code	1	0x81
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of ouput/8, if the remainder is not 0, N = N + 1

(2) n = N or N + 1

B.1.2 Function Code 0x05: Write Single Coil

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x05
	Output Address	2	0x0000 ~ 0xFFFF
	Output Value	2	0x0000(off), 0xFF00(on) A value of FF 00 hex requests the coil to be ON. A value of 00 00 requests it to be OFF. All other values are

			illegal and will not affect the coil.
Response	Function Code	1	0x05
	Output Address	2	0x0000 ~ 0xFFFF
	Output Value	2	0x0000(off), 0xFF00(on)
Error	Function Code	1	0x85
	Exception Code	1	0x01
			0x02
			0x03
			0x04

B.1.3 Function Code 0x0F: Write Multiple Coils

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x0F
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Outputs	2	0x0001 ~ 0x07B0
	Byte Count	1	N(1)
	Output Value	Nx1	The reguested ON/OFF states are specified by contents of the query data field. A logical '1' in a bit position of the field requests the corresponding coil to be ON. A logical '0' requests it to be OFF.
Response	Function Code	1	0x0F
	Output Address	2	0x0000 ~ 0xFFFF
	Output Value	2	0x0001 ~ 0x07B0
Error	Function Code	1	0x8F
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of ouput/8, if the remainder if different of 0, N = N + 1)

B.1.4 Register Definition

B.1.4.1 Counter Status

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	1 bit	Counter Status (0: Off, 1: On)	RW
0x0001	1			
0x0002	2			
0x0003	3			
0x0004	4			
0x0005	5			
0x0006	6		same as above	
0x0007	7			
0x0008	8			
0x0009	9			
0x000A	10			
0x000B	11			

B.1.4.2 Clear Counter Value

Protocol Address	Channel	Data Type	Description	Access
0x000C	0	1 bit	Clear counter value of digital input Read: Always return 0 Write 0: NA Write 1: Clear counter value	RW
0x000D	1			
0x000E	2			
0x000F	3			
0x0010	4			
0x0011	5			
0x0012	6		Same as above	
0x0013	7			
0x0014	8			

0x0015	9	
0x0016	10	
0x0017	11	

B.1.4.3 Counter Overflow Status

Protocol Address	Channel	Data Type	Description	Access
0x0018	0	1 bit	Counter overflow status of digital input Read 0: Normal Read 1: Overflow Write 0: Clear overflow status Write 1: NA	RW
0x0019	1	Same as above		
0x001A	2			
0x001B	3			
0x001C	4			
0x001D	5			
0x001E	6			
0x001F	7			
0x0020	8			
0x0021	9			
0x0022	10			
0x0023	11			

B.1.4.4 Counter Trigger

Protocol Address	Channel	Data Type	Description	Access
0x0024	0	1 bit	Counter Trigger 0: Low to High (Off to On) 1: High to Low (On to Off) Please restart the counter in the Counter Status register after changing the Counter Trigger.	RW
0x0025	1	Same as above		
0x0026	2			

0x0027	3	
0x0028	4	
0x0029	5	
0x002A	6	
0x002B	7	
0x002C	8	
0x002D	9	
0x002E	10	
0x002F	11	

B.1.4.5 Counter Power-On Status

Protocol Address	Channel	Data Type	Description	Access
0x0030	0	1 bit	Counter Power-On Status 0: Off (Stop after powering on) 1: On (Restarted after powering on)	RW
0x0031	1			
0x0032	2			
0x0033	3			
0x0034	4			
0x0035	5			
0x0036	6		Same as above	
0x0037	7			
0x0038	8			
0x0039	9			
0x003A	10			
0x003B	11			

B.1.4.6 Counter Safe Mode Status

Protocol Address	Channel	Data Type	Description	Access
0x003C	0	1 bit	Counter Safe Mode Status 0: Off (stop in safe mode) 1: On (continue in safe mode)	RW
0x003D	1		Same as above	

0x003E	2	
0x003F	3	
0x0040	4	
0x0041	5	
0x0042	6	
0x0043	7	
0x0044	8	
0x0045	9	
0x0046	10	
0x0047	11	

B.1.4.7 Filter Status

Protocol Address	Channel	Data Type	Description	Access
0x0048	0	1 bit	Digital Input Filter Status 0: Off, 1: On	RW
0x0049	1			
0x004A	2			
0x004B	3			
0x004C	4			
0x004D	5			
0x004E	6		Same as above	
0x004F	7			
0x0050	8			
0x0051	9			
0x0052	10			
0x0053	11			

B.1.4.8 DO Value

Protocol Address	Channel	Data Type	Description	Access
0x0054	12	1 bit	Digital Output Value 0: Off, 1: On	RW
0x0055	13		Same as above	
0x0056	14			

0x0057	15	

B.1.4.9 DO Power-On Value

Protocol Address	Channel	Data Type	Description	Access
0x0058	12	1 bit	Digital Output Power-On Value 0: Off, 1: On	RW
0x0059	13	Same as above		
0x005A	14			
0x005B	15			

B.1.4.10 DO Safe Mode Value

Protocol Address	Channel	Data Type	Description	Access
0x005C	12	1 bit	Digital Output Safe Mode Value 0: Off, 1: On	RW
0x005D	13	Same as above		
0x005E	14			
0x005F	15			

B.1.4.11 Pulse Status

Protocol Address	Channel	Data Type	Description	Access
0x0060	12	1 bit	Digital Output Pulse Status 0: Off, 1: On	RW
0x0061	13	Same as above		
0x0062	14			
0x0063	15			

B.1.4.12 Pulse Power-On Status

Protocol Address	Channel	Data Type	Description	Access
0x0064	12	1 bit	Digital Output Power-On Pulse Status	RW

			0: Off, 1: On	
0x0065	13	Same as above		
0x0066	14			
0x0067	15			

B.1.4.13 Pulse Safe Mode Status

Protocol Address	Channel	Data Type	Description	Access
0x0068	12	1 bit	Digital Output Safe Mode Pulse Status 0: Off, 1: On	RW
0x0069	13	Same as above		
0x006A	14			
0x006B	15			

B.1.4.14 Pulse Repeat Status

Protocol Address	Channel	Data Type	Description	Access
0x006C	12	1 bit	Digital Output Repeat Pulse Status 0: Off, 1: On	RW
0x006D	13	Same as above		
0x006E	14			
0x006F	15			

B.1.4.15 Reboot Device

Protocol Address	Data Type	Description	Access
0x0070	1 bit	1: reboot device	W

B.1.4.16 Reserved

0x0071 ~ 0x00FF Reserved
0x0100 ~ 0x07CF N/A

B.2 Function Code 0x02 Protocol

B.2.1 Function Code 0x02: Read Discrete Inputs

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x02
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Input	2	0x0001 ~ 0x07D0 (1~2000)
Response	Function Code	1	0x02
	Starting Address	1	N(1)
	Input Registers	1 x N	
Error	Function Code	1	0x82
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Inputs / 8. If the remainder is not 0, N = N + 1

B.2.2 Register Definition

B.2.2.1 DI Value

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	1 bit	Digital Input Value	R
0x0001	1	Same as above		
0x0002	2			
0x0003	3			
0x0004	4			
0x0005	5			
0x0006	6			
0x0007	7			
0x0008	8			
0x0009	9			

0x000A	10	
0x000B	11	

B.2.2.2 Reserved

0x000C ~ 0x00FF Reserved
0x0100 ~ 0x07CF N/A

B.3 Function Code 0x03, 0x06, 0x10 Protocols

B.3.1 Function Code 0x03: Read Holding Registers

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x03
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Register	2	0x0001 ~ 0x007D (1~125)
Response	Function Code	1	0x03
	Byte Count	1	2 x N(1)
	Registers Value	2 x N	
Error	Function Code	1	0x83
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Inputs Registers

B.3.2 Function Code 0x06: Write Single Register

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x06
	Register Address	2	0x0000 ~ 0xFFFF
	Register Value	2	0x0000 ~ 0xFFFF
Response	Function Code	1	0x06
	Register Address	2	0x0000 ~ 0xFFFF
	Register Value	2	0x0000 ~ 0xFFFF
Error	Function Code	1	0x86

	Exception Code	1	0x01
			0x02
			0x03
			0x04

B.3.3 Function Code 0x10: Write Multiple Registers

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x10
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Registers	2	0x0001 ~ 0x0078
	Byte Count	1	2 x N(1)
	Register Value	2 x N	
Response	Function Code	1	0x10
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Registers	2	0x01 ~ 0x7B (1~23)
Error	Function Code	1	0x90
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Registers

B.3.4 Register Definition

B.3.4.1 Filter Timer

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	Word	Digital Input Filter Timer 1~65535 ms	RW
0x0001	1	Same as above		
0x0002	2			
0x0003	3			
0x0004	4			
0x0005	5			
0x0006	6			

0x0007	7	
0x0008	8	
0x0009	9	
0x000A	10	
0x000B	11	

B.3.4.2 Digital Input operating Mode

Protocol Address	Channel	Data Type	Description	Access
0x000C	0	Word	Digital Input Mode 0x0000: DI 0x0001: Counter 0x0002~0xFFFF: Reserved Changing DI operating mode will also clear the Counter Value.	RW
0x000D	1	Same as above		
0x000E	2			
0x000F	3			
0x0010	4			
0x0011	5			
0x0012	6			
0x0013	7			
0x0014	8			
0x0015	9			
0x0016	10			
0x0017	11			

B.3.4.3 Pulse Output Times

Protocol Address	Channel	Data Type	Description	Access
0x0018	12	Word	Pulse Output Times (High Word)	RW
0x0019	12	word	Pulse Output Times (Low Word)	RW
0x001A	13	Same as above		
0x001B	13			
0x001C	14			

0x001D	14	
0x001E	15	
0x001F	15	

B.3.4.4 Digital Output Operating Mode

Protocol Address	Channel	Data Type	Description	Access
0x0020	12	Word	Digital Output Mode 0x0000: DO 0x0001: Pulse 0x0002 ~ 0xFFFF: Reserved	RW
0x0021	13	Same as above		
0x0022	14			
0x0023	15			

B.3.4.5 Pulse Low Signal Width

Protocol Address	Channel	Data Type	Description	Access
0x0024	12	Word	Pulse Low Signal Width in ms	RW
0x0025	13	Same as above		
0x0026	14			
0x0027	15			

B.3.4.6 Pulse High Signal Width

Protocol Address	Channel	Data Type	Description	Access
0x0028	12	Word	Pulse High Signal Width in ms	RW
0x0029	13	Same as above		
0x002A	14			
0x002B	15			

B.4 Function Code 0x04 Protocol

B.4.1 Function Code 0x04: Read Input Register

Command	Field	Length (bytes)	Value
Request	Function Code	1	0x04
	Starting Address	2	0x0000 ~ 0xFFFF
	Quantity of Registers	2	0x0001 ~ 0x007D (1~125)
Response	Function Code	1	0x04
	Byte Count	1	2 x N(1)
	Registers Value	2 x N	
Error	Function Code	1	0x84
	Exception Code	1	0x01
			0x02
			0x03
			0x04

(1) N = Quantity of Input Registers

B.4.2 Register Definition

B.4.2.1 Counter Value

Protocol Address	Channel	Data Type	Description	Access
0x0000	0	Word	Counter Value (High Word)	R
0x0001	0	Word	Counter Value (Low Word)	R
0x0002	1	Same as above		
0x0003	1			
0x0004	2			
0x0005	2			
0x0006	3			
0x0007	3			
0x0008	4			
0x0009	4			

0x000A	5	
0x000B	5	
0x000C	6	
0x000D	6	
0x000E	7	
0x000F	7	
0x0010	8	
0x0011	8	
0x0012	9	
0x0013	9	
0x0014	10	
0x0015	10	
0x0016	11	
0x0017	11	