Sharp JW10 Serial Programmable PLC

Device Driver Guide

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1. Sharp JW10 Serial Device Communications

1.1 Summary: JW10 Device Driver

The WebAccess SCADA Node provides a serial interface to the Sharp New Satellite JW10 Programmable PLC using the Computer Link.

1.1.1 Wiring and Cabling

There are two physical types of connections to the Sharp JW10:
1. **MMI Port** (this is the method tested for this manual).
2. **2-wire RS-422 Communication Terminals**. This method was not tested for this manual.
Please refer to the Manufacturer's Documentation for a description of wiring and cabling.

1.1.1.1 MMI Port

The **MMI Port** is a 9-pin port of the front of the PLC. This is the method tested for this manual.
This is a one-to-one Link (one PLC per com port).
This Guide was tested using a 9-pin to 9-pin cable labeled JW10/TP02 PC. The Sharp User's Manual describes a cable from Sharp (model JW-12KC). This
is a 9 pin to 25-pin cable.

1.1.1.2 2-wire Communications Port

The Computer Link can also be via the **Communication Port**. This is a two wire, RS-422A connection on the Lower terminals of the Model JW-1642K PLC. This is a multiple drop link (up to 63 PLCs per comport). This method was not tested for this manual.
The Lower Terminals of the JW-1624K used for 2-wire RS-422 are labeled **L1**,

L2 and **SHLD**. Shielded twisted pair is required.

1.1.2 PLC Settings

1.1.2.1 MMI Port

The **default settings** (memory #226 = 00000000) are:
Data Length = 7 bits
Stop Bits = 1
Parity = None
Transfer Rate = 19200
PLC Address = 01
When using the computer link mode of the MMI Port, the following system memory settings are used to set Data Length, Stop Bit, Parity and Transfer Rate.

System Memory Number: #226
Description: Transfer specifications
Format: D7,0,D5,D4,D3,D2,D1,D0
D7=Data Length:
D7=0= 7 bits;
D7=1= 8 Bits
D5=Stop Bits:
D5=0=1 bit;
D5=1=2 bits
D4,D3= Parity:
0,0 = None
0,1 = Odd
1,0 = Even
1,1 = Disabled
D2, D1, D0 = Transfer Rate (Bits / sec):
1,1,1 = 38400
0,0,0 = 19200
0,0,1 = 9600
0,1,0 = 4800
0,1,1 = 2400
1,0,0 = 1200
1,0,1 = 600
1,1,0 = 300
Since only one-to-one communications via the MMI port, the **PLC address** is
01.
The settings tested for this Device Driver Guide where the default:
Data Length = 7 bits
Stop Bits = 1
Parity = None
Transfer Rate = 19200

1.1.2.2   2-wire Communications Port

The JW10 has a two-wire Communications port for using the computer link,
data link or remote IO. This function is determined by system memory #234:
#234 = 0 = Computer Link Mode (required by WebAccess)
#234 = 1 = Data Link
#234 = 2 = Remote I/O Link.
System Memory #236 sets the Transfer specification for the 2-wire
Communications Port.
The default settings (memory #236 = 00000000) are:
Data Length = 7 bits
Stop Bits = 1
Parity = None
Transfer Rate = 19200
PLC Address = 01
System Memory Number: #236
Description: Transfer specifications
Format: D7,0,D5,D4,D3,D2,D1,D0
D7=Data Length:
D7=0= 7 bits;
D7=1= 8 Bits
D5=Stop Bits:

D5=0=1 bit;
D5=1=2 bits
D4,D3= Parity:
0,0 = None
0,1 = Odd
1,0 = Even
1,1 = Disabled
D2, D1, D0 = Transfer Rate (Bits / sec):
1,1,1 = 38400
0,0,0 = 19200
0,0,1 = 9600
0,1,0 = 4800
0,1,1 = 2400
1,0,0 = 1200
1,0,1 = 600
1,1,0 = 300
System Memory #237 sets the **PLC Address**: 001 to 077 (octal).
WebAccess would use decimal addresses: 1 to 63 (decimal).

2. WebAccess: Parameters

WebAccess drivers provide object-oriented "parameters" to guide novice users with pre-built templates containing typical addresses and provide a productivity tool for experienced users. Users can select a parameter type to start, and then modify the address to the correct register in order to build a tag.

Note 1 – WebAccess cannot write reliably to a Register if Ladder Logic is also writing to the same register. Ladder Logic executes more quickly that WebAccess and will overwrite any write from WebAccess.
Note 2 – The PLC must be in RUN mode for physical IO to be scanned by the PLC and written to memory of PLC.

3. Configure a Sharp JW device

3.1   Summary

1. Start Internet Explorer **Web Browser**.
2. Enter IP address of the **Project Node**.
3. Use **WebAccess Configuration**.
4. Open or Create a **Projec**t.
5. Configure a **SCADA node** (the PC that will connect to the automation hardware).
6. Configure a **Comport** for the SCADA Node that is a **Serial type**

Comport.

7. Configure Baud Rate, Data Bit, Stop Bits and Parity to match those in the PLC. All PLCs on this Comport must use the same settings.
The default settings (memory #236 or #226 = 00000000) are:
Data Length = 7 bits
Stop Bits = 1
Parity = None
Transfer Rate = 19200
PLC Address = 01
8. Configure a **SharpJW Device** (determines the communications Protocol or Device Driver) using **Add Device**
9. Use **Add Tag** to create tags.
10. Select a Parameter to match the type of data to be read (Analog Input, Analog Output, Digital Input, Digital Output). The Address of the data must match the Parameter Type:
11. Modify the Address to match the actual address.
12. Apply a Tag name.
13. Edit Tag to assign Alarms, Scaling, Engineering Units, Description and other features.

3.2   Serial Comport Properties

The Serial Comport is associated with an RS232C or RS422A port on the SCADA Node PC (usually an RS232C port). This number must match the actual COM1, COM2, etc on the SCADA node.
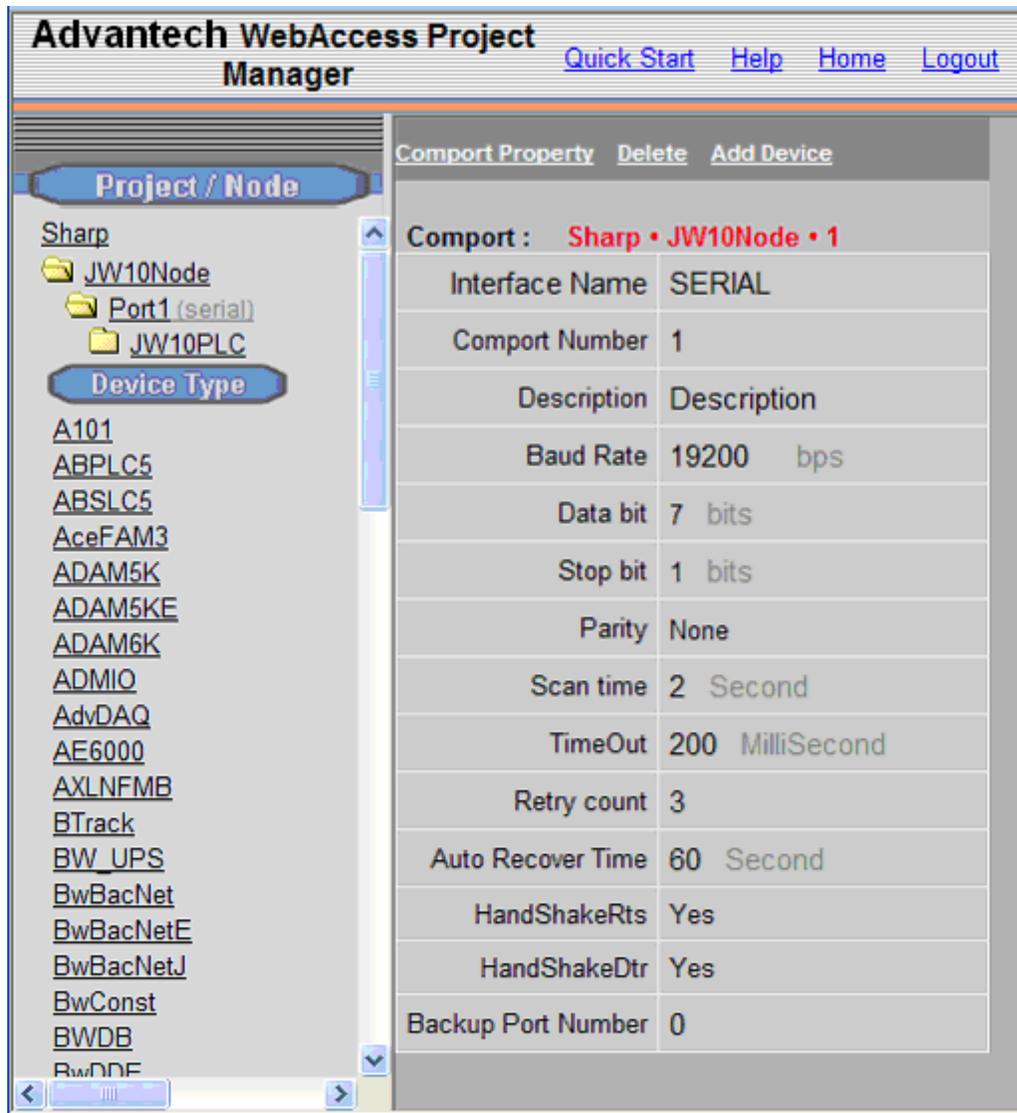
Figure 3.1 Serial Comport properties for Sharp JW – MMI Port, default settings (Memory #236 or #226 = 00000000

3.2.1   Comport Number

The Serial Comport requires the comport number to match that of the physical interface (e.g. COM1, COM2, COM3, etc) on the SCADA Node.

3.2.2   Description

This is an optional field used for user reference.

3.2.3   Baud Rate

For the Sharp JW10, values are from 300 to 38400 baud. **The default setting is 19200**.

This must match the baud rate configured in the PLC. *Please refer to the Manufacturer's Documentation to determine the actual baud rate set in the PLC.*

All PLCs connected to this comport must use the same Baud Rate.

3.2.4   Data Bits

For the Sharp JW 10, the values are 7 or 8 Data Bits. **The default setting is 7 bits.**

This must match the number of data bits configured in the PLC. *Please refer to the Manufacturer's Documentation to determine the actual number of Data Bits set in the PLC.*

All PLCs connected to this comport must use the same number of data bits. A typical value is 8 bits.

3.2.5   Stop Bits

For the Sharp JW 10 there can be 1 or 2 Stop Bits. **The default setting is 1 stop bit.**

This must match the number of stop bits configured in the PLC. *Please refer to the Manufacturer's Documentation to determine the actual number of Stop Bits set in the PLC.*

All PLCs connected to this comport must use the same number of stop bits.

3.2.6   Parity

For the Sharp JW 10 the Parity can be None, Odd, Even or Disabled. **The default setting is None.**

This must match the parity configured in the PLC. *Please refer to the Manufacturer's Documentation to determine the actual number of Data Bits set in the PLC.*

All PLCs connected to this comport must use the parity.

3.2.7   Scan Time

The Sharp JW 10 was tested with a Scan time = 2 Seconds.

This is the time in milliseconds to scan the PLC. This must match the ability of the PLC to respond.

If the PLC cannot respond as fast as the SCAN Time entered, WebAccess will scan at a slower rate.

3.2.8   Timeout

The Sharp JW 10 was tested with Time Out = 200 Milliseconds.

Timeout is the time waited before re-sending a communications packet that did not have a reply.

Timeout specifies how long the software waits for a response to a data request, specifically to wait for a reply from one packet. A recommended value is 7 to 10 ticks, longer if the communication device is slow. This is protocol dependent: some protocols do not allow changes in time out. Combined with Retry count, Timeout also determines time to consider a device or port as BAD. Timeout is the time to wait since last communication packet sent without a reply. Time is in milliseconds. The slow or poor quality communications require longer timeout. The faster the communications network or device, the shorter the timeout required. Shorter timeouts notify operators of communications failure more quickly.

3.2.9   Retry Count

The Sharp JW 10 was tested with Retry count = 3.

Number of times to retry communications if no reply is received from a device. Combined with Timeout, also determines time to consider a device or port as BAD.

In addition, Indicates the number of times after the first attempt has failed that communication should be attempted before indicating a failure. Specifically, how many times to send a single packet after the field device fails to respond to the first packet. After the retry count is exceeded, all the tags in the packet are marked with asterisks and the next packet of requests is sent. A reasonable value is 3 to 5 times. After this number of tries, the tags
in this packet are marked as "fail to respond" (i.e. asterisks) and are disabled.
In reality, increasing the number of retries hides failures on the part of the field device to respond to a request. Essentially, increasing the retries gives the field device more chances to reply.

3.2.10 Auto Recover Time

The Sharp JW 10 was tested with Auto Recover Time = 60 Seconds.
Auto Recover Time is the time to wait before attempting to re-establish communications with a BAD device or port.
If communications to the PLC is unusually slow due to hardware, communications or network issues, you might consider increasing this value. If communications to the PLC or RTU fails frequently, you may want to decrease this number in order to have WebAccess try to re-establish communications sooner.
If communications to the PLC, RTU or device Fails (i.e. exceeds Timeout) WebAccess will wait the Auto Recover Time before trying to re-establish communications.

3.2.11 Hand Shake RTS

The Sharp JW 10 was tested **HandShakeRts = Yes**.
The RTS (Request To Send) signal is raised and lowered on the Serial Communications Port if this value set to Yes.. RTS is determined by settings in the field device. *Refer to your device interface manual to determine the value for this field and the type of cable used.*

3.2.12 Hand Shake DTR

The Sharp JW 10 was tested with **HandShakeDtr = Yes**.
The DTR (Data Terminal Ready) signal raised and lowered on the Serial Communications Port if this value is set to Yes. DTR is determined by settings
in the field device and the type of cable used. *Please refer to the Manufacturer's Documentation to determine if DTR handshake is set in the PLC.*

3.2.13 Backup Port

The Backup Port has not been tested for the Sharp JW10.

3.3   Device Properties - SharpJW

Add your device to the Serial Port, by selecting the Serial Port you have configured, then select **Add Device**. Or, to modify an existing Device, Select **Device Properties**. The Device Properties Page for a Serial Type Device appears.
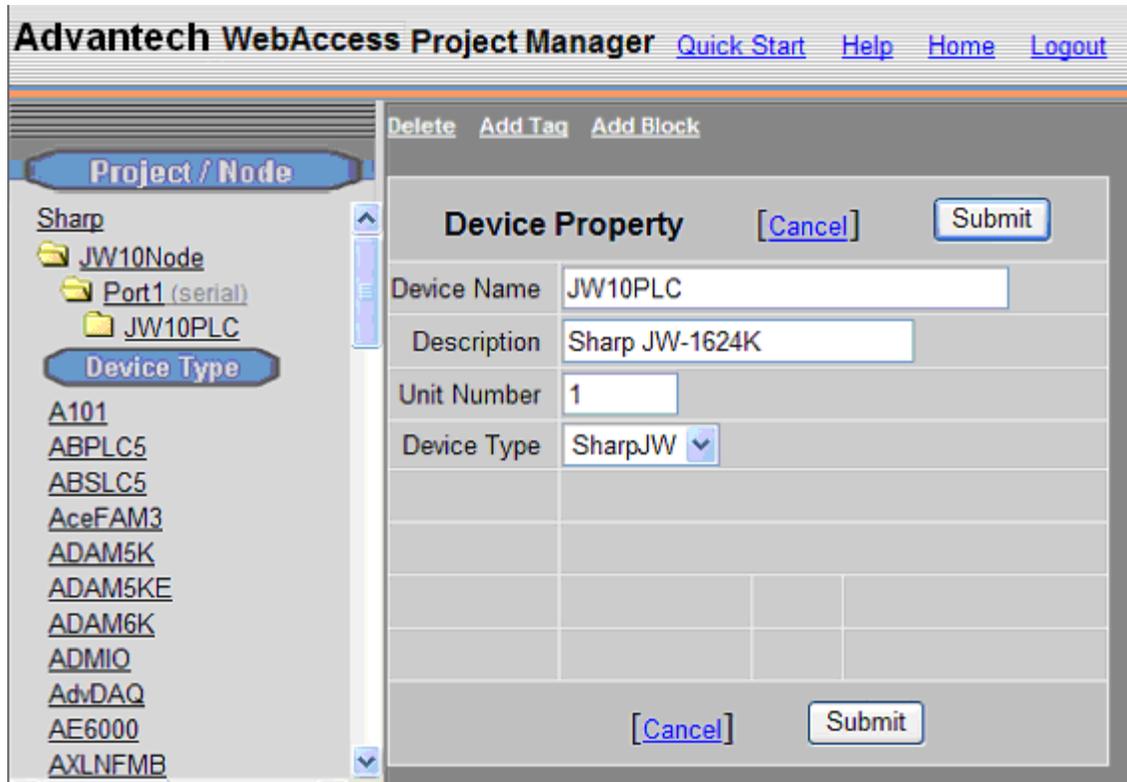
Figure 3-12 Sharp JW Device

3.3.1   Device Name

A Device is a PLC, Controller, VAV or other automation hardware or software entity. **Device name** is a User-assigned name that will appear in the Project Manager (Configuration Tool) and in runtime VIEW Displays. Choosing a descriptive Name can help technicians identify the location of your device. Changing only the Device Name will rename the existing device.
Changing both the **Device Name** and the **Unit Number** will make a copy of the device (e.g. create another device).

3.3.2   Description

User assigned description up to 70 characters

3.3.3   Unit Number

Unit Number, for Sharp JW, must correspond to the Unit Number used in the protocol addressing.
If using the **MMI Port,** since only one-to-one communications is supported via the MMI port, the **PLC address** is **1**.
If using the 2-wire Communications Port, the System Memory #237 sets the **PLC Address**: 001 to 077 (octal). WebAccess would use decimal addresses: 0 to 63 (decimal). *Reference: Sharp User's Manual, page 13.3*
See section 1.1.4 PLC Settings to determine actual settings in the PLC.

3.3.4   Device Type

The **Device Type** is **SharpJW**.

4. Configure Tags

4.1   Analog Tag

This example is to configure a Tag that reads an Analog Input (Address Register 900)

1. Open **Internet Explorer**.
2. Connect to **Project Node**.
3. Start **WebAccess Configuration**.
4. Select **Project**.
5. Select **SCADA Node**.
6. Select the Sharp JW10 **Device**.
7. Select **Add Tag**.
8. From **Parameter** Pull Down List Select **Reg0**. This will configure an Analog Input. Wait for the Page to update.
9. Optionally, select **ALARM** from the ALARM pulldown list. Wait for the Page to update with a PINK highlight around alarm (an additional Alarm Fields at bottom of page).

10. Enter a **Tagname** users can use to identify this Analog Input measurement. For example, if this is a Flow measurement, enter **Reg0**.
11. Edit the **Address** to the actual address. From the example, Enter:

09000

12. Enter a Description. This will help identify this tag to Users and
Operators. For example, enter Boiler #1 Steam Flow.
13. Optionally enter, Scaling, Span Hi, Span Low, Engineering Units, and
Alarms; enable data logging, etc.
14. Press **Submit**.

4.2   Digital Tag

This example is to configure a Tag that writes a Digital Output (Address DO
40)

15. Select the Sharp JW10 **Device**.
16. Select **Add Tag**.
17. From **Parameter** Pull Down List Select **DO**. This will configure an
Analog Input. Wait for the Page to update.
18. Optionally, select **ALARM** from the ALARM pull down list. Wait for the
Page to update with a PINK highlight around alarm (an additional
Alarm Fields at bottom of page).
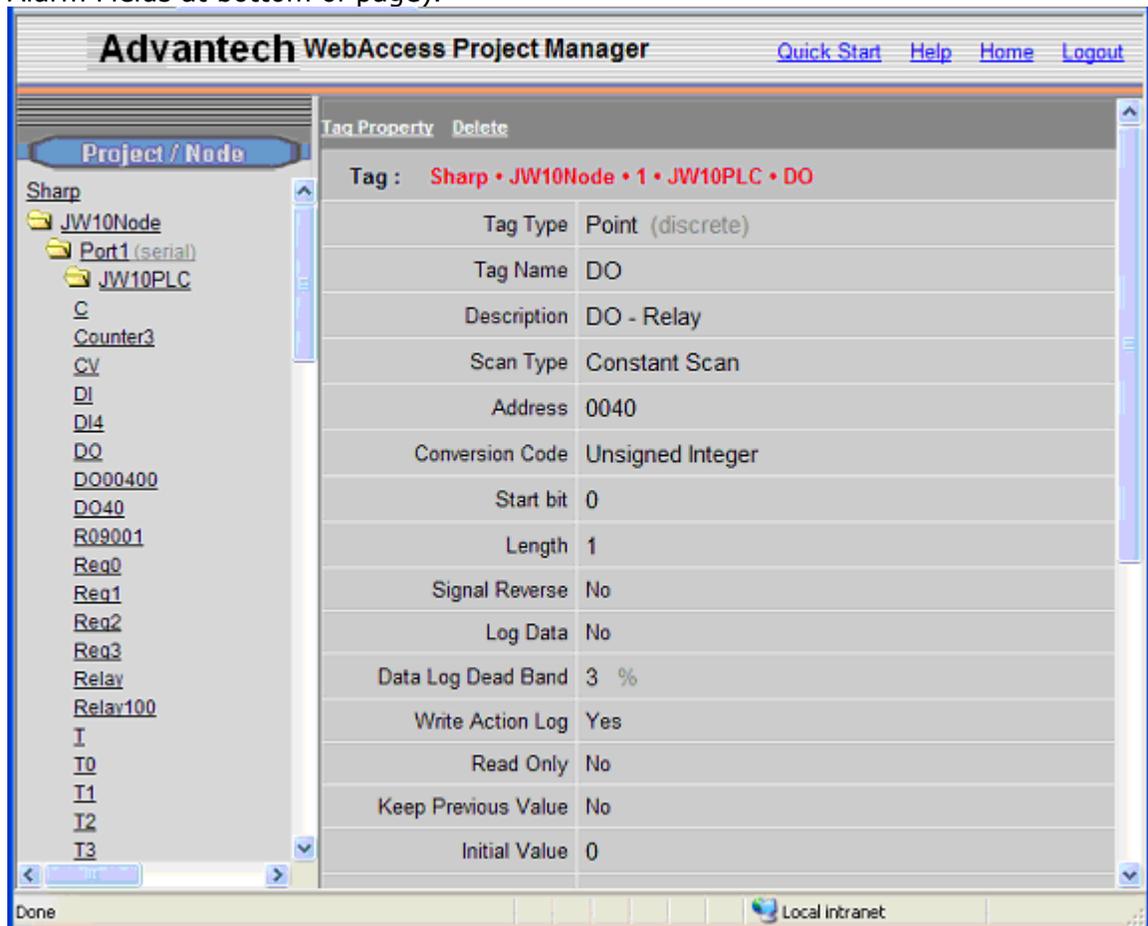
19. Enter a **Tagname** users can use to identify this Analog Input
measurement. For example, if this is a Flow measurement, enter **DO**.
20. Edit the **Address** to the actual address. From the example, Enter:
0040
21. Enter a Description. This will help identify this tag to Users and
Operators. For example, enter DO-Relay.

22. Optionally enter, State 0 Description, State 1 Description, Alarms, enable data logging, etc.

23. Press **Submit**.

Congratulations! You have just configured a Measurement and Output Tags to Sharp device.