

User Manual

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Series



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This manual is for ECU-1152 Series.

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user is required to correct interference at his own expense.

Technical Support and Assistance

- 1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
- 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Safety Instructions

- 1. Read these safety instructions carefully.
- 2. Keep this User Manual for later reference.
- 3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- 4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
- 5. Keep this equipment away from humidity.
- 6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
- 7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
- 8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- 9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- 10. All cautions and warnings on the equipment should be noted.
- 11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- 12. Never pour any liquid into an opening. This may cause fire or electrical shock.
- 13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- 14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
- 15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -25° C (-13° F) OR ABOVE 70° C (158° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
- 16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
- 17. Due to the sensitive nature of the equipment it must be stored in a restricted access location, only accessible by qualified engineers.
- 18. When installing this equipment, ensure that the Earth cable is securely attached using a 3.5 mm screw.
- 19. The equipment does not include a power cord and plug.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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4.3



Introduction

1.1 Product Concepts and Positioning

ECU-1152 is a RISC architecture platform with high performance, wide temperature and flexible design. It serves as a gateway connecting inverters and remote monitoring center in power and energy application, which plays an important role.



Specifications

2.1 ECU-1152 System Specification

| CPU | TI Cortex A8 |
|-----------------------|---|
| RAM | DDR3L 512MB |
| Power Requirement | 10-30VDC |
| Digital Input | 4-ch (Reserved) |
| Digital Output | 4-ch (Reserved) |
| Serial Port | 6xRS-232/485 (Terminal Block) 1xDebug Port (DB9) |
| USB | 1xUSB2.0 |
| Ethernet | 2x 10/100MB Base-T RJ-45 1x 10/100MB Base-T RJ-45 (Reserved) |
| Display | 1x VGA (Reserved) 640 x 480 (3:6:4)) |
| LEDs | PWR/Programmable LED/Serial Port |
| Storage | 2x Micro SD (Storage & image) |
| Wireless | 1 x Mini-PCIe (Full-Size, USB Signal) |
| Node ID | 8-bit |
| Operation Temperature | -40~70 °C |
| Storage Temperature | -40~85°C |

2.2 Input/ Output Hardware Specifications (Reserved)

| Digital Input | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|
| Channel | 4 | | | | | | |
| Input Type | Sink (Wet Contact) | | | | | | |
| Wet Contact Input | Logic0: 0 ~ 4 VDC Logic1: 10~30 VDC | Logic0: 0 ~ 4 VDC Logic1: 10~30 VDC | | | | | |
| Rated Voltage | 12/24 VDC | | | | | | |
| Rated Input Current | >5 mA @ 12 VDC >10 mA @ 24 VDC | | | | | | |
| Over Voltage Protection | +40 VDC | | | | | | |
| Isolation Voltage | 3000 VDC | | | | | | |
| | | | | | | | |
| Digital Output | | | | | | | |
| Channel | 4 | | | | | | |
| Output Type | Open Collector (Sink) | | | | | | |
| | Rated Voltage | 5~30 VDC | | | | | |
| OC Output | Rated Current | 200 mA (max.load) | | | | | |
| Over Voltage Protection | +40 VDC | | | | | | |
| Isolation Voltage | 3000 VDC | | | | | | |

2.3 Environment

- Operating Temperature: -40~70°C
- Storage Temperature: -40~85°C
- Operating Humidity: 20~95% (non-condensing)
- Storage Humidity: 0 ~ 95% (non-condensing)

2.4 LED Status Indicator



Figure 2.1 LED Status Indicator

2.4.1 System Status Indicator

| LED | Status | Description | | | | |
|-----|--------|--|--|--|--|--|
| | Green | Power is on | | | | |
| FVK | Off | Power is off | | | | |
| DI | Green | - Customers define according to the actual need. | | | | |
| PL | Off | | | | | |

2.4.2 Serial Communication Status Indicator

| LED | Color | Description |
|-----|-------|---|
| TX0 | Green | Flash, Debug port data being transmitted |
| RX0 | Green | Flash, Debug port data being received |
| TX1 | Green | Flash, Serial port 1 data being transmitted |
| RX1 | Green | Flash, Serial port 1 data being received |
| TX2 | Green | Flash, Serial port 2 data being transmitted |
| RX2 | Green | Flash, Serial port 2 data being received |
| TX3 | Green | Flash, Serial port 3 data being transmitted |
| RX3 | Green | Flash, Serial port 3 data being received |
| TX4 | Green | Flash, Serial port 4 data being transmitted |
| RX4 | Green | Flash, Serial port 4 data being received |
| TX5 | Green | Flash, Serial port 5 data being transmitted |
| RX5 | Green | Flash, Serial port 5 data being received |
| TX6 | Green | Flash, Serial port 6 data being transmitted |
| RX6 | Green | Flash, Serial port 6 data being received |

2.4.3 Ethernet Status Indicator

| LED | Color | Description |
|-------|--------|---|
| Link1 | Orange | Lighting, Ethernet not connected |
| Act1 | Green | Blinking, Ethernet data being transmitted |
| Link2 | Orange | Lighting, Ethernet not connected |
| Act2 | Green | Blinking, Ethernet data being transmitted |

2.5 Chassis Dimensions





ECU-1152 User Manual



Wiring and Installation

3.1 Wiring

3.1.1 Power Supply Wiring

ECU-1152 supports power input ranging from 10 VDC to 30VDC. Users can choose standard 12VDC or 24 VDC power supply.



Figure 3.1 Power Supply Wiring

3.1.2 Serial Port Wiring

ECU-1152 is equipped with 6 RS-232/485 serial ports. Users can select RS-232 or RS-485 through a jumping node. The detailed jumping method is described in the installation section. The wiring of serial port is as following. ECU-1152 also has a DB9 interface. It is a debug interface, not a serial port.

| <u>сом</u> 1 2 | 11 | С Г 1 | <u>ом</u> 2 | 2 | ر ۲ | ≫ОМ 2 | 3 | ې ٦ | <u>ом</u> 2 | 4 | ر ا | ом 2 | 5 | ز ۳ | 2 2 | \$ |
|-------------------|----|-------------|----------------|---|--------|----------|---|--------|----------------|---|--------|---------|---|--------|--------|----|
| ĨĨ | ì | Ĩ | Ĩ | Ĩ | í | ũ | Ĩ | Ĩ | Ĩ | Ĩ | Ĩ | Ì | Ĩ | Ĩ | ũ | Ĩ |

| COM1~6 | | | | | | | |
|------------------|-----|-----|--|--|--|--|--|
| PIN RS-232 RS-48 | | | | | | | |
| 1 | RX | D+ | | | | | |
| 2 | ТХ | D- | | | | | |
| 3 | GND | GND | | | | | |

Figure 3.2 RS-232/485 serial port definition

3.2 Installation

3.2.1 Wall-mounted and DIN-Rail Installation

ECU-1152 supports two types of installation: Wall-mounted and DIN-Rail Installation. For wall-mounted installation, users can fix the device on the wall with 4 screws as shown below.



Figure 3.3 Wall-mounted installation

For DIN-Rail installation, ECU-1152 support horizontal or vertical installation. Users should order additional DIN-Rail buckle (SN: 1950020136T001) with this installation. The installation way is fixing the sliver DIN-Rail buckle with screws on the back of ECU-1152. And then fix ECU-1152 on the DIN-Rail. The detailed steps are shown as below:









Figure 3.5 Horizontal DIN-Rail Installation



Figure 3.6 Vertical DIN-Rail buckle Installation





3.2.2 SD Card Installation

ECU-1152 is equipped with two Micro SD slots. Open the left sliver plate, users can see two MicroSD slots. The left slot, the above of it written "storage", is for storing data. The right slot, the above of it written "image", carries the OS.





Figure 3.8 SD card installation

3.2.3 Wireless Card Installation

ECU-1152 is equipped with a Mini-PCIe interface on the back of motherboard, which supports one full-size wireless network card. If users also need SIM card, slot on the front of motherboard can be used. The installation is shown as below.



Figure 3.9 Wireless network card Installation



Figure 3.10 SIM card installation

3.3 Jumper/Switch Setting

3.3.1 Dial Switch Setting

ECU-1152 has an 8-bit node ID. The detailed definition is as follows:



NODE ID Figure 3.11 Node ID setting

| Table | 3.1: ECU | -1152 Node I | D Setting |
|-------|----------|--------------|--|
| No. | Name | Meaning | Description |
| 1 | SW2 | Node ID | 8-bit, support 0~255 devices. In peer to peer applica- tion, the Node ID should be 1~255. |

3.3.2 Jumper Setting

The motherboard of ECU-1152 has two types of jumper for users operating, as the below shown.



Figure 3.12 Jumper on the back motherboard

| Table 3.2: ECU-1152 Jumper Setting | | | | | | | | |
|------------------------------------|------|----------------------------|-------------|--|--|--|--|--|
| Location | Name | Meaning | Description | | | | | |
| CN64 | COM1 | | RS-232 | | | | | |
| CN65 | COM2 | | 00 | | | | | |
| CN66 | COM3 | DS 222 or DS 485 Selection | | | | | | |
| CN67 | COM4 | | RS-485 | | | | | |
| CN51 | COM5 | | 0 0 | | | | | |
| CN53 | COM6 | | | | | | | |



Advantech Tag Link

4.1 Advantech Tag Link Introductions

If there's one or more ECU-1152 in the field site, it's more convenient for users with a tool to complete the integrated configuration and remote management. To solve this, Advantech developed the Tag Link software to facilitate these tasks.

Advantech Tag Link can be operated in Windows XP/ Windows 7 system and has the following functions:

Provide interface for off-line project configuration, and remote deploy the configuration base on the adjustable NodeID.

Easy to configure the project tags with actual meaning, and easy to map these tags to the Modbus and DNP3 services.

With regard to network communications, user can complete the setting for Ethernet, Wi-Fi, 3G and GPRS via Taglink Studio.

ECU-1152 provides Modbus/RTU, Modbus/TCP and DNP 3.0 servers, and customers can flexibly choose protocol services according to their own needs.

Advantech Taglink Studio support remote monitoring of communication status of serial ports and Ethernet ports.

Advantech Taglink Studio can be downloaded from Advantech support website: http://support.advantech.com/

4.2 Using Taglink Studio for Configuration and Management

4.2.1 Project Initialization

Project initialization can be achieved while users start Taglink software, and step by step complete 'Create Project' -> Right click to 'Add Device' -> Right click to 'Copy' (for large number ECU-1152)

4.2.1.1 Creating a new project

Start Taglink Studio software, click 'Create Project' button under the taskbar 'Project', and you will find the dialog box as follows. Then you should input the project name, description and select the storage directory, and click the 'OK' button.

| Solar Communication Gateway | |
|--|--|
| | |
| Ying.Liu | |
| C:\Users\ying.liu\Documents\Advantech TagLink Studio\Pro | jecl •• |
| Solar Communication Gateway project site deployment | 4 |
| | × |
| | ::\Users\ying.liu\Documents\Advantech TagLink Studio\Pro |

Figure 4.1 Creating a new project

4.2.1.2 Adding Devices and Editing a Project

After completing the creation of the new project, users can right click on the project name to check the project information and add new devices. To add devices, users need to input the general information of device: name, device type, password, indentity, and description. The indentity has two types: Node ID and IP Address. Users can select any of them according to their own needs. Then click "Apply" to add the device.

After adding the device, users can modify the device information by double-click the device name on the left-hand-side tree view, or right-click on the device name, and choose 'edit'.

| ECU-11 | 52 1# | Apply | Cancel Change | |
|------------------|------------------|-------|---------------|--|
| 🚰 General Inform | nation | | | |
| Name: | ECU-1152 1# | | | |
| Device Type: | ECU-1152-R11AAE | | | |
| Password: | | | | |
| Indentity: | Node ID | * | | |
| Node ID: | 10 | | | |
| IP Address: | 0.0.0.0 | | | |
| Description: | solar gateway 1# | + | | |
| | | ÷. | | |



| CU-11 | 52 2# | | Apply | Cancel Change |
|----------------|------------------|---|-------|---------------|
| General Inform | nation | | | |
| Name: | ECU-1152 2# | | | |
| Device Type: | ECU-1152-R11AAE | | | |
| Password: | | | | |
| Indentity: | IP Address | • | | |
| IP Address: | 10.0.16 | | | |
| Description: | Solar gateway 2# | - | | |
| | | | | |
| | | | | |

Figure 4.3 Adding device with IP address identity

4.2.1.3 Copying Devices

To reduce the complexity of configuring a lot of devices on the field, Taglink Studio supports the ability to copy device information within a project. Users can right-click on the device name and choose "copy". The copied device will have the same configuration as the original device. Users need to modify the name, Node ID or IP as well as the description according to the project planning.



Figure 4.4 Copying devices

4.2.1.4 Deleting Devices

Users can also right-click on the device name and choose "delete" to delete the device in the project.

4.2.1.5 Project Download

After the device has been identified, users can download the device information to the relevant device. Batch download function is supported. If users select a project on the left tree menu and then click "Project Download", a dialog will pop us listing all RTU devices for batch download. If users select a certain device and then click "Project Download", a dialog will pop up with only one RTU device to be downloaded.

- 1. Select a project or a device.
- 2. Click "Project Download"
- 3. Click "Download" button to start downloading.
- 4. In "Project Download" dialog, "Progress" shows the current download progress. When complete, click "Close" button.
- 5. In "Project Download" dialog, "Reboot" allows users to set whether to reboot the device after the downloading is complete.

| Create Open Close Save Project Project Project Open Close Save Project Project Open Close Save Project Open Close Save | To Show Tag rd Count | | | | | |
|--|-------------------------|---|---|----------------------|--------|--|
| Project Configuration = ■ Selar Commencation Gatework ■ ■ Col-1152 1170 1 ■ Data Center ■ \$10 Tag # \$10 Tag | | | | | | |
| G System Tag Goldstein Tag Goldste | | Ø Project Download Ø Name Ø ECU-1152 14-10 Ø ECU-1152 24-10.0 | Status IP Comple success 0 Comple success | Progress 0% 0% | | |
| Project Configuration Order Device | 5 | Reboot | | Download | Cose 4 | |

Figure 4.5 Project Download

4.2.1.6 Show Tag Count

Click "Show Tag Count" to show the number of the configured tags of each device under a project.





4.2.1.7 Export to SD Card

If users want to copy the configured project to ECU-1152 device in absence of network connection, "Export to SD Card" is an option.

- 1. If selecting a project, click "Export to SD Card" will pop up the window listing all devices in the project. If selecting a device, click "Export to SD Card" will pop up the window listing the selected device.
- 2. Select a target path to export to.
- 3. Click "Export" button. When the progress bar is complete, export action is successfully completed.
- 4. Click "Close" button.

Then insert SD card into ECU-1152 and power on it to update the project.



| <u>R</u> | Advantech TagLink St | udio | - O X |
|---|---|--|----------------|
| Create Open Close Save Project Project Project J Deploy | Show Tag Count | | ~ (0) |
| Project Configuration | | | |
| Data Center | K Export To SD Card | | x |
| €-500 COM1 | | | |
| 🛅 тср | Name | Status | |
| AgBee-min/Cle/USB System Tag Calculation Tag Galculation Tag System System Connectivity System Data Logger Action Connectivity System Data Logger Connectivity System | ECU-1152 1#-10 ECU-1152 2#-10.0.0.16 There is not removable dev 2 Export To: | The Node ID is not set, project for this device could not be export to Si ice | e 4 |
| × = - | | | |

Figure 4.7 Export to SD Card

4.2.2 Data Acquisition Configuration

Data acquisition is an important function for ECU-1152 device. ECU-1152 supports the acquisition of serial IO devices, Ethernet devices as well as wireless Zigbee devices to satisfy the diversified acquisition needs. Therefore in Taglink Studio, users need to add and configure those tags based on the specific acquisition requirements.

These IO tags added into the project are real tags. While in actual project deployment, local tags of engineering significance are also needed. Users are required to add and configure them in Taglink Studio.

4.2.2.1 Configure IO of Serial Devices

ECU-1152 offers 6 * RS232/485 serial ports. Users need to add new ports into Taglink Studio following the below procedures.

- 1. Right-click on "Data Center" and choose "Add Port".
- 2. Select the port type from the drop-down list. Then "Serial Port Setting" will appear and allow users to set the related parameters according to their requirements.

In "General Information", users can also set "Scan Time", "Time Out", "Retry Count" and "Auto Recover Time".

- 3. After the setting, click "Apply" button to save the changes.
- 4. If users don't want to save the changes, click "Cancel Change".

| 5 | | Advant | tech TagLink Studio | | | | _ D X |
|---|----------------|-----------------|-------------------------|---------------|-------------------------|-------|---------------|
| Project Help | | | | | | | ۍ 🗠 |
| | | | | | | | |
| Project Project Project | Download SD Ca | ard Count | | | | | |
| Project 4 | Deploy | Wew Port/ECIL | 1152 1#* | | | | |
| Project Configuration | * | W New Porticeo | 1152 1#) | | | | |
| Solar Communication Gateway | 1 | New Po | rt | | -4 | Apply | Cancel Change |
| Data Center | | General Inform | ation | | | | î |
| ZigBee-miniPCIe/ | USB | Type: | Serial | - 2 | Scan Time(ms): | 1000 | |
| - I System Tag - I Calculation Tag - I User Tag | | Description: | Serial XBee/XBee-PRO | Time Out(ms): | 3000 | | |
| | | | TCPIP Retry | Retry Count: | 3 | | |
| Data Logger Deta Logger Service | | | | * | - Auto Recover Time(s): | : 10 | |
| Connectivity | - | Serial Port Set | ting 3 | | | | |
| ECU-1152 2#-10.0.0.16 | | Port: | COM1 | • | | | |
| Data Logger | | Baud Rate: | 9600 | | Parity: | None | |
| E Service | | Data Bit: | 8 | * | RTS: | False | |
| System | | Stop Bit: | 1 | • | DTR: | False | |
| | - | | | | | | Ĩ |
| | | | | | | | |
| | | | | | | | |
| 5 | <u> </u> | | | | | | |
| | | | | | | | |

Figure 4.8 Adding COM port

5. After adding the COM port successfully, users can right click on the COM port to edit/delete it.

| 9 | Advantech TagLink Studio | _ _ X |
|---|---|--------------|
| Project Help | | a 🕡 |
| Create Open Close Save Project Project Project | Project Export To Downbad SD Card Deploy Option | |
| Project Configuration | <i>"</i> | |
| Solar Communication Gatew Solar Communication Gatew Data Center Data Center Data Center Data Center Calculation Tag Calculation Tag Data Logger Service Data Logger Data Logger Connectivity System Data Logger Connectivity System Data Logger Connectivity System Data Logger Service System Data Logger System Data Logger System | meter te | |

Figure 4.9 Edit or Delete COM port

- 6. Right-click on the port name and select "Add Meter" to configure the serial device, whose detailed setting are shown in the below figure.
 - a. Fill in a meter name.
 - b. Select the meter type. According to different meter types, it will appear "Extension Properties" or not.
 - c. Set the unit number of the meter.
 - d. Give a description of the meter, which is optional.
 - e. In "Extension Properties", users can set some related parameters of the protocols.
 - f. Then, click "Apply" button to save the setting.
 - g. If users don't want to save the changes, click "Cancel Change" button.

| <u>16</u> | Advantech | TagLink Studio | | _ • × |
|---|--|--|---|---------------|
| Project Help | | | | ۵ (|
| Create Open Close Save Project Project Project Download SD O | art To Card Show Tag Count Option | | | |
| Project Configuration « | NewMeter(ECU-115 | 2 1#)* × | | |
| Solar Communication Gateway | New Met | er | Apply | Cancel Change |
| - Data Center | General Information | n | | â |
| Calculation Tag Calculation Calculation Tag Calculation Calculation Calcul | Name: Meter Type: Unit Number: Description: | TemperatureSensor 1# APAX 1 Temperature Sensor 1# | 4 4 5 | |
| ECU-1152 2#-10.0.0.16 | Extention Propertie | es (6 | | |
| Data Logger Service | Packet Delay (ms): | | | |
| Connectivity | 50 | | | |
| ⊕–le System | Digital block size: | | | |
| | 512 | | | |
| | Analog block size: | | | |
| 1 . | 64 | | | |
| | | | | * |

Figure 4.10 Adding COM Meter

- 7. After adding the new meter successfully, users need to configure IO tag. The procedures are as below.
 - a. Double-click "IO Tag" in the left tree menu or right-click on it and select "Edit".
 - b. Click "Add" button to add IO tag.
 - c. Fill in the basic information of IO tag.
 - d. If the data type is "Analog", it will appear the "Advanced" dialog. Users can select the scaling type according to real needs.
 - e. Click "OK" button to successfully adding the tag. Then this new tag will appear in I/O Tag list.
 - f. Users can select one tag to delete or modify it.

| Copen Close Save Project Project Project Project | Show Tag Count Option | 1#-TemperatureSensor 1#) | | |
|--|--|--------------------------|---|--|
| Toject Configuration Solar Communication Gateway Gut ECU-1152 1#-10 Data Center Data Center Data Center | IO Tag(ECU-1152 | 1#-TemperatureSensor 1#) | | |
| Solar Communication Gateway | | |) × | |
| 🖨 🔤 Data Center | I/O Tag | | Add | 7 Modify 8 Delete |
| e-com COM1 | Name Switch | Data Type Discrete | Initial Value | Address Conversi Scale Type 00001 N/A No Scale |
| i TemperatureSensor 1# | New Tag Basic 3 | | Advanced | |
| System Tag System Tag Calculation Tag Calculation Tag Calculation Tag Calculation Tag Calculation Tag Calculation Tag Calculation Tag Calculation Tag Connectivity Connectivity Connectivity Connectivity Connectivity Connectivity Connectivity Connectivity Connectivity | Name: Voltage Data Type: Analog Conversion Unsigned Address: 30001 Start Bit: 0 Length(bit): 16 Initial Value: 0.0 Description: | ■ Integer ■ | Scaling Type: Formula: Scale: Bias: Span High: Span Low: Clamp: | No Scale 0 |

Figure 4.11 Adding COM Meter IO Tag

8. If users want to delete the newly added meter, right click on the meter name and select "Delete" to remove it.

4.2.2.2 Configure IO of Ethernet Devices

ECU-1152 offers 2 Ethernet port. TagLink Studio supports to edit/delete the port and add meter to it.

1. Right-click on the port name and select "Edit" to change the Ethernet port setting which are shown in below.



Figure 4.12 Editing Ethernet Information



This TCP port is a software port, so the quantity of its entity ports is not restricted to 2. Users can freely add a new port as required.

- 2. Right-click on the port name and select "Delete" to remove this port.
- 3. Right-click on the port name and select "Add Meter" to configure the Ethernet device, whose detailed settings are shown in the below figure.

| 5 The Protocol High | Advantech | TagLink Studio | | > |
|---|--|----------------------------------|-------|---------------|
| Create Open Close Save Project Project Project Download SD C | t To ard Option | | | ω (|
| Project Configuration « | NewMeter(ECU-115 | 52 1#)* × | | |
| Solar Communication Gateway | New Met | er | Apply | Cancel Change |
| - Data Center | General Information | n | | î |
| COM1 | Name: Meter Type: Unit Number: Description: | PowerMeter 1# ADAM6K | | |
| 🚽 User Tag 🕀 🥽 Data Logger | A TCP/IP | | | |
| Connectivity System | IP Address: Port Number: | 10.0.0.8 0 | | |
| time ECU-112 2#-10.0.016 The second | Extention Properti | es f other than Unit Number): | | |
| | Device Address (| f other than Unit Number): | | ļ |

Figure 4.13 Adding TCP Meter

4. After adding a new meter successfully, users need to configure IO tag, the procedures of which are similar as for "Configure IO of Serial Devices".

| The Parts of Links | | Advantech TagLink St | udio | | | | |
|--|--------------------------------------|------------------------|------------|-----------------------------------|------------------------|---------------------|------------------------|
| Project Project Project Downloa Project Project Downloa | Export To d SD Card ploy Q Opt | w Tag punt ion 4 | | | | | |
| Project Configuration | « Power | Meter 1#(ECU-1152 1#) | 🐻 IO Tag(E | CU-1152 1#-PowerM | eter 1#) × | | |
| Solar Communication Gateway | 1/O | Tag | | Add | d 7 Modi | fy 🚯 | Delete |
| Data Center Data Center Data Center COM1 | Name • current | Data T Analog | уре | Initial Value 0.0 | Address 30001 | Conversi Integer | Scale Type No Scale |
| IO Tag | Basic 3 | | | Advanced | 4 | | × |
| IO Tag | Name: Data Type: | NewTag Analog | • | ScalingType: Formula: | No Scale | | • |
| ZigBee-miniPCIe/USB | Address: Start Bit: | 0 | | Scale: Bias: | 0 | | |
| User Tag Data Logger Concerning Data Logger | Length(bit): Initial Value: | 16 0.0 | | Span High: Span Low: Clamo: | 0 0 Clamp to low | | |
| Connectivity System EU-1152 2#-10.0.0.16 | beschpeen | | - | | Clamp to high | h o | |

Figure 4.14 Adding TCP Meter IO Tag

If users want to delete the newly added meter, right-click on the meter name and select "Delete" to remove it.

It should be noted that Taglink Studio supports one Ethernet port by default. If two or more Ethernet ports are required, users need to add new ports referring to the following procedures.

- 1. Right-click on "IO Tag" and select "Add Port".
- 2. Select the port type and fill in the port name.
- 3. Give a description basic setting of the Ethernet port.
- 4. Then, click "Apply" button to save the settings.
- 5. If users do not want to save the changes, click "Cancel Change" button.

| | | | | Adv | ntech TagLink Studio | | - • × |
|--|--|--------------------|------------------------|-------------------|----------------------|-----------------------|-----------------------|
| Project | Help | | | | | | ⇔ @ |
| reate Open Clo roject Project Proj | se Save | Project Downloa | Export To d SD Card | Show Tag Count | | | |
| Project Configuration | - | « | TCP(ECU- | 1152 1#) | | ¢ | |
| Solar Communication Gateway | | ау | New | Port | | • | Apply 5 Cancel Change |
| | ag 1 | | 🚰 General I | nformation | | | |
| B-000 (| COM1 | | Type: | TOP | p - 🛃 | Scan Time(ms): | 1000 |
| e- 🛄 1 | CP | | Name: | Ser | VRee PRO | Time Out(ms): | 3000 |
| e-E | PowerMete | er 1# | Descriptio | n: TCF | P | Retry Count: | 3 |
| - 🔀 Z | igBee-miniPC | Ie/USB | | | - | Auto Recover Time(s): | 10 |
| Calcu Guser Calcu Connect System System | Jation Tag Tag gger twity 2#-10.0.0.16 nter gger | , and | | | | | |

Figure 4.15 Adding and Editing TCP Port

4.2.2.3 Configure IO of Wireless Zigbee Devices

For acquisition requirements of wireless Zigbee devices, users can right-click on the port name to edit/delete it and add meter to it.

1. The port setting are preset when Zigbee port was firstly added. If there is any information needed to be changed, right-click on the port name and select "Edit" to modify, then click "Apply" button to save the changes.

| <u>K</u> | | Advantech TagLink Studio | | | | _ |
|---|--|--------------------------|---|-----------------------|-------|--------------|
| Project Help | | | | | | ~ (i) |
| Create Open Close Save Project Downloa | Export To d SD Card Co option | v Tag unt on | | | | |
| Project Configuration « | ZigBee(ECU-11 | 52 1#) × | | | | |
| Solar Communication Gateway | ZigBee | | | | Apply | icel Change |
| - IO Tag | 🚰 General Inform | ation | | | | â |
| ⊕-507 COM1 ⊕-507 COM2 | Type: | XBee/XBee-PRO | - | Scan Time(ms): | 1000 | |
| е-бот тор | Name: | ZigBee | | Time Out(ms): | 3000 | |
| | Description: | | | Retry Count: | 3 | |
| Syster | | | + | Auto Recover Time(s): | 10 | |
| User Delete | Serial Port Set | ting | | | | |
| | Port: | miniPCIe/USB | • | | | |
| System | Baud Rate: | 9600 | - | Parity: | None | • |
| ECU-1152 2#-10.0.0.16 | Data Bit: | 8 | • | RTS: | False | • |
| 🕀 🛶 Data Center | Stop Bit: | 1 | • | DTR: | False | • |
| a-ॡ Service a-™ Connectivity a-ᡂ System | Extension Properties [D] PAN ID (64 bits): | | | | | |
| | 00000000000 | 0000 | | | | |
| 1 | SC] Scan Ch | annels (bitfield): | | | | |
| | | | | | | |

Figure 4.16 Editing Zigbee Information

2. Right-click on the port name and select "Add Meter" to add a new Zigbee device.

| i | Advantech TagLink Studio | |
|---|--|-----------------------|
| Project Help | | ۵ · |
| Create Open Close Save Project Project Project | t Export To ad SD Card Deploy | |
| Project Configuration « | NewMeter(ECU-1152 1#)* × | |
| Solar Communication Gateway ECU-1152 1#-10 Data Center | New Meter | Apply 5 Cancel Change |
| - IO Tag | General Information | |
| System Tag Service | Name: NewMeter Meter Type: Modicon Unit Number: 1 Description: None | • |
| E-System | Extention Properties | |
| ECU-1152 2#-10.0.0.16 | ZigBee 64-bit Address: | |
| 🖲 🚍 Data Logger | 000000000000 | |
| Connectivity | Zigsee 16-bit Address: | |
| ⊞-19 System | Use ASCII Protocol: | |
| | 0 | |
| × 💆 - | Packet Delay (ms): | |

Figure 4.17 Adding Zigbee Meter

- 3. Add IO tag of wireless Zigbee device the procedures of which are similar with "Configure of Serial Devices".
 - a. Double-click or right-click IO tag to edit it.
 - b. Click "Add" to add new I/O tag.
 - c. Fill in the basic information of IO tag.
 - d. If the data type is "Analog", it will appear the "Advanced" dialog. Users can select the scaling type according to real needs.
 - e. Click "OK" button to successfully adding the tag. Then this new tag will appear in I/O Tag list.
 - f. Users can select one tag to delete or modify it.

| Project Help | | Advan | tech TagLink Studi | 2 | | | | - | |
|---|---|--|---------------------|---------|---|--|---|------------|---------|
| Create Open Close Save Project Project Project | ct Export To oad SD Card Deploy 4 Op | ow Tag count | | | | | | | |
| Project Configuration « | IO Tag(ECU-1 | 152 1#-! | NewMeter) × | | | | | | |
| Solar Communication Gateway Solar ECU-1152 1#-10 Data Center | I/O Ta | g | | | | Add | 6 Modify | De | lete |
| ⊨- ∰ IO Tag | Name | | Data Type | Initial | Value | Address | Conversi | Scale Type | Descrip |
| ⊕-500 COM1 | Displacement | | Analog | 0.0 | | 30001 | Unsigned | No Scale | |
| ⊕-₩ COM2 | 🚯 Update Tag: Displacement 🔹 🔍 | | | | | | | | |
| TCP2 | Basic 3 Advanced 4 | | | | | | | | |
| Argene-mmPCleV/Si Argene-mmPCleV/Si Argene-mmPCleV/Si Argene-mmPCleV/Si System Tag Calculation Tag Gene-mapClevelocity Service Connectively System ECU-152 2#-10.00.16 EData Cogger Data Cogger Data Cogger Data Cogger | Name: Data Type: Conversion Address: Start Bit: Length(bit): Initial Value: Description: | Displac Analog Unsign 30001 0 16 0.0 | ement ed Integer | • | ScalingType Formula: Scale: Bias: Span High: Span Low: Clamp: | : No Sc 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | ale imp to low imp to high imp to zero | | |
| | | | | | | 5 | ок | Car | ncel |

Figure 4.18 Adding Zigbee Meter IO Tag

4.2.2.4 View System Tag

System tag keeps basic information and hardware status of RTU. In this page, users can only view the preset system tags. The operations of adding, editing or deleting are not available.

| Project Configuration « | System Tag(ECU-1152 1#) | x | | |
|--|-------------------------|-----------|---------|--|
| Solar Communication Gateway Culture ECU-1152 1#-10 | System Tag | | | |
| | Name | Data Type | Unit | Description |
| E COM1 | #SYS_UPTIME | Analog | s | The current uptime(s) |
| E COM2 | #SYS_CURRENT_TIME | Analog | s | The current system time(s) |
| 😐 📶 ТСР | #SYS_CPU_FREQ | Analog | Hz | CPU frequency |
| TCP2 | #SYS_MEM_SIZE | Analog | Byte | Memory size(Byte) |
| | #SYS_CPU_USED | Analog | % | CPU utilization rate(%) |
| System Tag | #SYS_MEM_USED | Analog | % | Memory utilization rate(%) |
| | #SYS_TFCARD_CAPACITY | Analog | Byte | TF card capacity(Byte) |
| Bata Longer | #SYS_TFCARD_FREE_SPACE | Analog | Byte | TF card free space(Byte) |
| e a Service | #SYS_SDCARD_CAPACITY | Analog | Byte | SD card capacity(Byte), the value is 0 if there is no SD card |
| Connectivity | #SYS_SDCARD_FREE_SPACE | Analog | Byte | SD card free space(Byte), the value is 0 if there is no SD card |
| system | #SYS_NODE_ID | Analog | | Node ID on RTU |
| ECU-1152 2#-10.0.0.16 | #MOBILE_MNO | Analog | | Mobile network operator |
| i 🚽 📥 Data Center | #MOBILE_MNT | Analog | | Mobile network type |
| 🕀 📻 Data Logger | #MOBILE_MDT | Analog | | Mobile data traffic |
| E Convertie | #MOBILE_MPN | Analog | | Mobile phone number |
| System | #MOBILE_SIGNAL_QUALITY | Analog | | Signal quality of sim card. |
| Eng System | #MOBILE_CSQ | Analog | | Received Signal Strength Indication |
| | #WLAN0_SIGNAL_QUALITY | Analog | | Signal quality of wian0. |
| | #WLAN0_SIGNAL_LEVEL | Analog | | Signal level of wlan0. |
| | #GPS_LATITUDE | Analog | degrees | Latitude for the GPS module |
| | #GPS_LONGITUDE | Analog | degrees | Longitude for the GPS module |
| | #GPS_ALTITUDE | Analog | m | Altitude for the GPS module |
| | #GPS_SPEED | Analog | knots | Speed for the GPS module |
| | #GPS_COURSE | Analog | degrees | Course for the GPS module |
| | + #GPS SATELLITE | Analog | | Status of the GPS module: 0-error state, 1-use GPS module working, 2-use a preset location information |

Figure 4.19 Viewing System Tag

SYS_UPTIME: The current time (s)

SYS_CURRENT_TIME: The current system time (s)

SYS_CPU_FREQ: CPU frequency (Hz)

SYS_MEM_SIZE: Memory size (Byte)

SYS_CPU_USED: CPU utilization rate (%)

SYS_MEM_USED: Memory utilization rate (%)

SYS_TFCARD_CAPACITY: TF card free space (Byte)

SYS_TFCARD_FREE_SPACE: TF card free space (Byte)

SYS_SDCARD_CAPACITY: SD card capacity (Byte), the value is 0 if there is no SD card

SYS_SDCARD_FREE_SPACE: SD card free space (Byte), the value is 0 if there is no SD card

SYS_NODE_ID: Node ID on RTU

MOBILE_MNO: Mobile network operator

MOBILE_MNT: Mobile network type

MOBILE_MDT: Mobile data traffic

MOBILE_MPN: Mobile phone number

MOBILE_SIGNAL_QUALITY: Signal quality of sim card

MOBILE_CSQ: Received signal strength indication

WLAN0_SIGNAL_QUALITY: Signal quality of wlan0

WLAN0_SIGNAL_LEVEL: Signal level of wlan0

GPS_LATITUDE: Latitude for the GPS module

GPS_LONGITUDE: Longitude for the GPS module

GPS_ALTITUDE: Altitude for the GPS module

GPS_SPEED: Speed for the GPS module

GPS_COURSE: Course for the GPS module

GPS_SATELLITE: Status of the GPS module: 0-error state, 1- use GPS module working, 2- use a preset location information

4.2.2.5 Configure Calculation Tag

Calculation tag is a kind of special tags, the value of which indicates the calculation result of a formula. The parameter of this formula can be a tag or a constant. Also, the expression can utilize some common calculation methods, including arithmetic & logic operation and trigonometric function, etc.

Calculation tag can perform some relatively complex operations, such as converting the acquired sensor value to the real physical quantity (liquid level, wind speed, etc.), so as to make the computation less intensive for the upper computer as well as the device more intelligent.

Each calculation tag corresponds to one expression which may support at most 8 tags as its input variables. For users' convenience, 8 tags are represented by A, B, C, D, E, F, G and H (case insensitive) in the expression.

- 1. Please follow the procedures to add a calculation tag:
 - a. Double-click on "Calculation Tag" in the left tree menu.
 - b. Click "Add" button to add a new calculation tag.
 - c. Fill in the basic information. "Periods (s)" specifies how often the tags are calculated, and its unit is second.
 - d. Enter an expression. Users can select default function or operator from the pull-down lists or type them manually. The example figure shows the calcu-

lation expression of "Lighting Failure", the expression logic of which is that the lighting is failed when the value of any tag in four switches is 0.

- e. Double-click the variable box to add a tag.
- f. Click "OK" button to add the calculation tag.

| | | Advantech T | agLink Studio | | | | | | |
|---|---|---------------------------|---------------|--------------|--|-----------|--------------|------------------|--|
| Project Hep Create Open Close Save Project Project Project Close Save Downl | ct Export To oad SD Card Deploy 0 | Now Tag Count ption | | | | | | U 60 | |
| Project Configuration « | Calculation 1 | ag(ECU-1152 1# | #) × | | | | | | |
| Solar Communication Gateway | Calcula | ation T | ag | | Ad | d | Modify | Delete | |
| | Name | Data | Туре | Initial Valu | e Fo | rmula | | Description | |
| System Tag | Lighting Failure | Analog | 2 | 0.0 | no | t(A and B | and C and D) | | |
| User Tag | 🛃 Update Tag: Li | ghting Failure | | | | | | x | |
| ⊕- a Service | Basic 3 | | | | Advanced | | | | |
| E-G System | Name: | Name: Lighting Failure | | | Mathematical Functions Trigonometry | | | | |
| ECU-1152 2#-10.0.0.16 | Initial Value: | 0.0 | | 1 | Assignment Boolean logic Constant | | | onstant • | |
| 🔁 🐺 Data Center | Period(s): | Period(s): 1 | | | Expression: | | | | |
| | Description: | I | | 4 not(/ | not(A and B and | C and D) | | - +- x= | |
| - System | | | | | A: Switch1 | | B: Switch2 | | |
| | | | | | C: Switch3 | | D: Switch4 | | |
| | | | | | E: Double click to | o add tag | F: Double d | lick to add tag. | |
| | | | | | G: Double click to | o add tag | H: Double d | lick to add tag. | |
| | | | | | | 6 | ОК | Cancel | |
| 1 - | | | | | | | | | |
| | | | | | | | | | |

Figure 4.20 Adding Calculation Tag

2. Users can click the calculator button on the right of "Expression" box to check the expression right or not. Then the "Calc Expression" window will show as below. This interface is roughly the same as "Advanced" setting interface in the above, but with a "=" button and a box displaying the operation result. Besides, the variable boxes here require users to input the variable values rather than tag names. To verify the expression is correct or not, users can click the "=" button to get the result.

| Machematical * | Functions 🔹 | Trigonometry | * | | |
|----------------------|-----------------|--------------|---|---|----|
| Assignment 🔹 | Boolean logic 🔻 | Constant | - | | |
| Formula: | | | | | |
| not(A and B and C | and D) | | | 0 | A. |
| | | | | | Ψ. |
| | B= 2 | | | | |
| A= 1 | - | | | | |
| A= 1 C= 3 | D= 4 | | | | |
| A= 1 C= 3 E= 5 | D= 4 F= 6 | | | | |

Figure 4.21 Checking Calculation Expression

Through the drop-down boxes, users can set the functions and operators calculation tag supports, which are divided into five categories: "Mathematical", "Functions", "Trigonometry", "Assignment" and "Boolean logic". Moreover, "Constant" box is also provided, allowing users to select from three constants: pi (the ratio of the circumference to the diameter of a circle), epsilon (the smallest positive double value that is greater than zero) and inf (infinity).

As shown in the figure below, the functions or operators listed in the box can be classified into three types: With no brackets, this indicates binary operations (labeled with 1); With brackets but no comma, this means this function only has one parameter (labeled with 2); With brackets and comma, this means the function supports more than one parameter (labeled with 3).

| Basic | | Advanced |
|----------------------------|------------------|--|
| Name: | Lighting Failure | Mathematical Functions Trigonometry |
| Initial Value: | 0.0 | Assignment 💦 Boolean logic 💌 Constant |
| Period(s): Description: | 1 | Expression: 1 and mand(,) 3 mor(,) nand nand nand |
| | | A: Switch1 2 not() C: Switch3 or h4 |
| | | E: Double click to add tag F: Double click to add tag G: Double click to add tag H: Double click to add tag |

Figure 4.22 Function and Operator Description

All functions and operators are described as follows:

| Arithmetical Operation | Description |
|---------------------------|--|
| + | Addition |
| - | Subtraction |
| * | Multiplication |
| / | Division |
| % | Remainder. For example: 7%3=4 |
| ٨ | Exponentiation. For example: 2^3=8 |
| Function | Description |
| min | Minimum. Several parameters can be included. For example: min(1,2,3,4)=1 |
| max | Maximum. Several parameters can be included. For example: max(1,2,3,4)=4 |
| avg | Average. Several parameters can be included. For example: avg(1,2,3,4)=2.5 |
| sum | Sum. Several parameters can be included. For example: sum(1,2,3,4)=10 |
| abs | Absolute value. For example: abs(-1)=1 |
| ceil | Ceil. For example: ceil(1.1)=2?ceil(-1.1)=-1 |
| floor | Floor. For example: floor(1.1)=1?floor(-1.1)=-2 |
| round | Round. For example: round(1.1)=1?round(1.5)=2?round(-1.1)=-1?round(-1.5)=-2 |
| roundn | Roundup and rounddown. Parameter 1 is the numerical value and parameter 2 is the number of decimal places. For example: roundn(1.246,0)=1?roundn(1.246,1)=1.2?roundn(1.246,2)=1.25 |
| exp | Exponential function with base e?≈2.71828182845905?. For example: exp(0)=1?exp(1)=2.71828182845905 |
| log | Natural logarithm with base e. For example: log(2.71828182845905)=1?log(1)=0 |
| log10 | Logarithm with base 10. For example: log10(1)=0?log10(10)=1 |
| logn | Logarithm with base n. Parameter 1 is the antilogarithm and parameter 2 is the base. For example: logn(8,2)=3 |
| root | Cubic root of n. Parameter 1 is the radicand and parameter 2 is the radical exponent. For example: root(9,2)=3 |
| sqrt | Square root of a non-negative real number. For example: sqrt(9)=3 |
| clamp | Clamp calculation. Restrict the variable value between the maximum value and the minimum value. Parameter 1 is the min. value, parameter 2 is the variable value and parameter 3 is the max. value. For example: clamp(1,2,3)=2?clamp(1,-1,3)=1?clamp(1,10,3)=3 |
| inrange | Determine whether the variable value is within the given value field. Parameter 1 is the min. value, parameter 2 is the variable value and parameter 3 is the max. value. For example: inrange(1,2,3)=1?inrange(1,-1,3)=0?inrange(1,1,3)=0,inrange(1,1,3)=1 |
| Trigonometric Function | Description (Note: The unit of all parameters used in trigonometric function is radian rather than angle degree. For example, an angle of 90 degrees is represented by pi/2) |
| sin | Sine function. For example: sin(pi/2)=1?sin(pi/6)=0.5?sin(0)=0 |
| cos | Cosine function. For example: cos(0)=1?cos(pi)=-1?cos(pi/3)=0.5 |
| tan | Tangent function. For example: tan(0)=0?tan(pi/4)=1 |
| acos | Arc-cosine function. For example: acos(1)=0?acos(-1)=3.14159265358979 |
| asin | Arc-sin function. For example: asin(0)=0?asin(1)=1.5707963267949 |

| atan | Arc-tangent function. For example: atan(0)=0?atan(1)=0.785398163397448 |
|-----------------------|---|
| atan2 | To get the radian of the angle formed by a line with origin of coordinates as its endpoint and X-axis, in which parameter 1 is y and parameter 2 is x. For example: $atan2(0,1)=0?atan2(1,0)=1.5707963267949$ |
| sinh | Hyperbolic sine function. Equivalent formula is sinh(x)=(exp(x)-exp(-x))/2 |
| cosh | Hyperbolic cosine function. Equivalent formula is cosh(x)=(exp(x)+exp(-x))/ 2 |
| tanh | Hyperbolic tangent function. Equivalent formula is tanh(x)=sinh(x)/ cosh(x)=(exp(x)-exp(-x))/(exp(x)+exp(-x)) |
| cot | Cotangent function, which calculates the ratio of the adjacent side of an right triangle against its opposite side. |
| CSC | Cosecant function, which calculates the ratio of the hypotenuse of an right triangle against the opposite side of a acute angle. |
| sec | Secant sech function, which calculates the ratio of the hypotenuse of an right triangle against the adjacent side of a acute angle. |
| Logical Judg- ment | Description (Note: If the result of a logical judgment is true, the value is 1; otherwise, the value is 0) |
| == | Equality |
| != | Inequality |
| < | Less than |
| <= | Less than or equal to |
| > | Greater than |
| >= | Greater than or equal to |
| Boolean Operation | Description |
| and | And operation. There are two variables on both sides of "and", separated by a blank space. If both two variables are not 0, the operation result is 1; otherwise, the result is 0. For example: 1 and 2=1?0 and 1=0 |
| or | Or operation. There are two variables on both sides of "or", separated by a blank space. If both two variables are 0, the operation result is 0; otherwise, the result is 1. For example: 1 or $0=1?0$ or $0=0$ |
| mand | And operation function. Here, more than two variables are supported. If all variables are not 0, the operation result is 1; otherwise, the result is 0. For example: $mand(1,2,3)=1?mand(1,2,0)=0$ |
| mor | Or operation function. Here, more than two variables are supported. If all variables are 0, the operation result is 0; otherwise, the result is 1. For example: $mor(1,0,0)=1?mor(0,0,0)=0$ |
| nand | Nand operation. There are two variables on both sides of "nand", sepa- rated by a blank space. If both two variables are not 0, the operation result is 0; otherwise, the result is 1. For example: 1 nand 0=1?1 nand 1=0?0 nand 0=1 |
| nor | Nor operation. There are two variables on both sides of "nor", separated by a blank space. If both two variables are 0, the operation result is 1; otherwise, the result is 0. For example: 0 nor 0=1?1 nor 1=0?0 nor 1=0 |
| not | Not operation function. If the variable is 0, the result is 1; otherwise, the result is 0. For example: not(0)=1?not(1)=0 |
| xor | Exclusive or operation. There are two variables on both sides of "xor", sep- arated by a blank space. If both two variables are 0 or both are not 0, the operation result is 0; otherwise, the result is 1. For example: 0 xor 0=0, 1 xor 1=0, 0 nor 1=1 |

| xnor | Xnor operation. There are two variables on both sides of "xor", separated by a blank space. If both two variables are 0 or both are not 0, the operation result is 1; otherwise, the result is 0. For example: 0 xor 0=1, 1 xor 1=1, 0 nor 1=0 |
|------|--|
|------|--|

4.2.2.6 Configure User Tag

IO tags described in the previous sections are all real ones, while some unreal IO tags are also need in the process of project deployment. This kind of tags is optional and called User Tag which can be used for C and KW language programming, as a control signal or a manifestation of an operation result.

User tag configuration is supported by TagLink Studio. Users can configure them one by one based on real needs for future programming. Please follow the below procedures to configure a user tag:

- 1. Double-click or right-click "User Tag" in the left menu tree to select "Edit".
- 2. Click "Add" button to add a new user tag.
- 3. Fill in the basic information of the tag.
- 4. Click "OK" button to save the changes.
- 5. If users do not want to save the changes, click "Cancel" button.
- 6. Users can select one or more tags and click "Delete" or "Modify" button to delete or modify the tag.

| K. | Advan | tech TagLink Studio | | | | x |
|--|---|---------------------|---|--------|-------------|--------|
| Project Hep Create Open Close Save Project Project Downlow | t Export To ad SD Card eploy Option | | | | | ~ 0 |
| Project Configuration « | 😼 User Tag(ECU-1152 1# | *) × | | | | |
| Solar Communication Gateway ECU-1152 1#-10 ECU-1152 1#-10 | User Tag | | Z | Add | 6 Modify | Delete |
| er → a bata Center ⊕ → io Tag → io System Tag | Name Usertag1 | Data Type Analog | Initial Value 10.0 | Retain | Description | |
| User Tag | 🕂 Update Tag: | usertag1 | | | × | |
| e œ Service e · · · · · · · · · · · · · · · · · · · | Name: | usertag1 | | | | |
| a 🗣 Data Center a Data Logger a ₴ Service | Initial Value: | 10.0 | | | | |
| 🗴 👕 Connectivity | Description: | | * | | | |
| | | | а ок | Cancel | | |
| × 📮 🔹 | | | | | | |
| | | | | | | |

Figure 4.23 Adding User Tag

4.2.3 Data Logger Configuration

ECU-1152 supports data logger function to store the tag data.

4.2.3.1 Add Data Logger Tag

ECU-1152 has no tag configured by default. In project configuration, users can add and configure tags according to the real application. Please follow the below procedures to add a tag for data logger configuration.

- Double-click "Periodic Logger" to add the tag. Users can set the logger parameter according to the real needs.
 Enable: Tick this box to enable the data logging function.
 USB Disk Backup: Tick this box to automatically backup the historical data to USB disk when it is inserted.
 Storage Path: The data storage path is SD card.
 Periods (s): The data storage period. The unit is second and the default value is 1 second.
 Max Days (d): The maximum days the historical data can be stored. The default value is 7. The earliest data will be deleted if the maximum days have been exceeded.
 Space needed: The least disk space needed to save the historical data for the configured number of days.
- 2. Double-click "Double click to edit".
- 3. In "Select Tag" window, tick the needed tags. Click "OK" button to add the selected tags.
- 4. Click "Apply" button.

| 5 | Advantech TagLink Studio | _ D X |
|--|---|---|
| Project Help | | ۵ 🔞 |
| Create Open Close Save Project Project Project Downlo | t Export To ad SD Card Sploy | |
| Project Configuration « | Periodic Logger(ECU-1152 1#)* × | |
| Solar Communication Gateway ECU-1152 1#-10 G G G G G G G | Periodic Logger | Apply 6 Cancel Change |
| Data Logger | ☑ Enable ☑ USB Disk Backup | It is about 183.76 MB free space needed in SD Card to save historical data. |
| ECU-1152 2#-10.0.0.16 | Storage Path: SD Period(s): 4 Max Days(d): 10 | System Tag #SYS_CPU_USED #SYS_VEM_USED #SYS_TECADO CADACITY |
| ⊕ Z Service | Tag Name Description | #SYS_TFCARD_FREE_SPACE |
| E-G Connectivity | switch_1 | #SYS_SDCARD_CAPACITY |
| tel−tel System | current | #STS_SUCARD_FREE_SPACE |
| | Displacement | - MOBILE_MNO |
| | #SYS_UPTIME The current uptime(s) | #MOBILE_MNT |
| | #SYS_CURRENT The current system time(s) | #MOBILE_MDT |
| | #SYS_CPU_FREQ CPU frequency | - #MOBILE_SIGNAL_QUALITY |
| | #SYS_MEM_SIZE Memory size(Byte) | - #MOBILE_CSQ |
| | #GPS_LATITUDE Latitude for the GPS module | #WLANO_SIGNAL_QUALITY |
| | #GPS_LONGITUDE Longitude for the GPS module | - #GPS_COURSE |
| | #GPS_ALTITUDE Altitude for the GPS module | #GPS_SATELLITE |
| | #GPS_SPEED Speed for the GPS module | Calculation Tag |
| 1 - 3 | f. Double click to edit | |
| | | 4 OK Cancel |

Figure 4.24 Adding Data Logger Tag

4.2.3.2 Delete Data Logger Tag

In project configuration, users can delete the unneeded tags as required. Please follow the below procedures to delete a data logger Tag.

- 1. Right-click on the unneeded tags, click "Delete".
- 2. In the pop-up dialog box, click "Yes" button.
- 3. Then click "Apply" button.

| 5 | Advantech TagLink Studio | _ D X |
|---|---|---|
| Project Help | | ۵ ۵ |
| Create Open Close Project Project Project Downlo | t Export To ad SD Card eploy Opton | |
| Project Configuration « | Periodic Logger(ECU-1152 1#)* × | |
| Solar Communication Gateway | Periodic Logger | Apply Cancel Change |
| Data Logger Data Logger Derivation Derivat | ✓ Enable ✓ USB Disk Backup Storage Path: SD Period(s): 4 Max Days(d): 10 | It is about 175.40 MB free space needed in SD Card to a save historical data. |
| e ≥ Service e 3 Service e 3 System | Tag Name Description Votage Delete Switch3 Switch1 Switch1 current Delete Delete Switch2 The current uptime(s) #SYS_UPTIME The current uptime(s) #SYS_CUPLIENT The current system time(s) #SYS_CPU_FREQ CPU frequency | Î |
| × = - | #SYS_MEM_SIZE Memory size(Byte) #GPS_LATITUDE Latitude for the GPS module | |

Figure 4.25 Deleting Data Logger Tag

4.2.4 Protocol Service Configuration

ECU-1152 supports four standard protocols: Modbus, DNP3, WASCADA and IEC-104, which can realize the communication between ECU-1152 and the lower acquisition devices as well as the upper central devices.

4.2.4.1 Modbus Server

Modbus server achieves the mapping from tag to Modbus address, allowing Modbus Client on the upper computer to read/write tags via Modbus TCP or Modbus RTU.

 Modbus TCP Configuration Modbus TCP service allows the upper computer to access the device through Modbus TCP protocols of TCP/IP.

The configurations of Modbus TCP are as follows:

- Port Number: Set the number of the port Modbus TCP listens on. The default number is 502.
- Max Users: Set the maximum number of users that can be connected at the same time. The default value is 4, which means at most 4 client ends can simultaneously access the device through Modbus TCP protocol.
- Idle Time: Specify the maximum time when the client writes/reads no data to/from the server after the TCP connection has be established. The default value is 120 seconds. After that, the client will be automatically disconnected from the server. If this value is set to 0, the server will never be disconnected.
- 2. Modbus RTU Configuration

Modbus RTU service allows the upper computer to access the device through serial port connection (RS-232/485) or virtual serial port connection via Modbus RTU protocol.

The configurations of Modbus TCP are as follows:

- Device ID: It is sometimes called Station Number, which is the node ID of a Modbus RTU device on serial bus.
- Port: Specify the serial port number Modbus RTU service will apply to. The drop-down list shows all available ports of the current device. If a certain port is missed, it means this port may be occupied by other services.
- Baud Rate: Set the baud rate of the serial transmission. The default value is 9600.
- Data Bit: Set the data bit of the serial transmission. The default value is 8.
- Stop Bit: Set the stop bit of the serial transmission. The default value is 1.
- Parity: Specify the parity check rules of the serial transmission. The default option is Node, which means no parity check is applied.
- 3. Modbus Address Mapping

To let Modbus client capable of accessing to the tags on the device, users should map the tags to the corresponding Modbus addresses first. The procedures are as below:

a. Add the tag to Modbus address list.

1)Double-click "Double click to edit" cell.

- 2)Tick the tag(s) to be added into Modbus address list. One or multiple tags can be selected at the same time.
- 3)Select the data type and data converting method of the mapping, which will be applied to all the selected tags.
- 4)Click "OK" button to finish adding tags to the address list.
- 5)Repeat the above steps to add more tags.

| <u>6</u> | Advantech Ta | agLink Studio | | _ _ x |
|--|---|--|-------|--|
| Project Help | | | | ۵ (|
| Create Open Close Save Project Project Open Close Download Downloa | t Export To ad SD Card eploy Option | | | |
| Project Configuration « | M Modbus Server(ECU-1152 1# |)* × | | |
| Solar Communication Gateway General ECU-1152 1#-10 | Modbus Serve | er | Apply | Cancel Change |
| Grading System Tag Grading System Tag Grading System Tag Grading System Tag Grading Server Data Logger Grading Server Dyr83 outstation WASCADA Grading System Grading System | Modbus TCP Port Number: 502 Max Users: 4 Idle Time(s): 120 Tag Name Tag Type Double clck to edt | Select Tag Select Tag Select Tag Solution Solution | /pe | U U U U U U U U U U |

Figure 4.26 Adding Modbus Tag

- b. If users want to change the mapping setting, the available options are:
 - Tag Type: There are four tag types: AI, AO, DI and DO, respectively corresponding to four tag types of Modbus protocol.
 - Address: Set the starting address of a tag in Modbus address space. The minimum address is 1. On the right is Modbus Address column, which is non-editable. The values within this column are made of tag type and tag address, ruled by Modicon.
 - Data Type: There are 2 broad types: Integer and Float. The former one is further classified to 6 categories by sign and bit number (16, 32, 64); while the later one is classified to 2 categories (Float and Double) by its precision (single or double).
 - Little Endian: The default option is big endian (Network Byte Order). If the client only can accept the data of little endian, please tick "Little Endian" box.
 - Reverse Word: If "Little Endian" is ticked, then this option will reverse the byte order. Normally, this option will reverse the word (two bytes) order. It should be noted that "Little Endian" option is before "Reverse Word" option, which means if both options are ticked, the byte order will be firstly reversed and then the word order will be reversed when the mapped tag value is read.

| Tag Name | Tag Type | Address | Modbus Address | Data Type | Little Endian | Reverse Word |
|--------------|----------|---------|----------------|-----------------|---------------|--------------|
| Voltage | AI | 0001 | 30001 | Float (32 bits) | | |
| current | AI | 0003 | 30003 | Float (32 bits) | | |
| Displacement | AI | 0005 | 30005 | Float (32 bits) | | |
| Switch1 | DI | 0001 | 10001 | | | |
| Switch2 | DI | 0002 | 10002 | | | |
| Switch3 | DI | 0003 | 10003 | | | |
| Switch4 | 01 | 0004 | 10004 | | | |
| switch_1 | DI | 0005 | 10005 | | | |
| | | | | | | |

Figure 4.27 Changing Modbus Tag

4. Comparison Table of Modbus Data Type Conversion

To facilitate the understanding of the data type conversion, please refer to the below examples, in which the tag values are hexadecimal and every byte is separated by space.

| | Original Value | Little Endian | Reverse Word | Little Endian + Reverse Word |
|---|----------------------------|----------------------------|----------------------------|---------------------------------|
| Signed/Unsigned Integer (16 bits) | 12 34 | 34 12 | 12 34 | 34 12 |
| Signed/Unsigned Integer / Float (32 bits) | 12 34 56 78 | 78 56 34 12 | 56 78 12 34 | 34 12 78 56 |
| Signed/Unsigned Integer / Double (64 bits) | 12 34 56 78 90 AB CD EF | EF CD AB 90 78 56 34 12 | CD EF 90 AB 56 78 12 34 | 34 12 78 56 AB 90 EF CD |

4.2.4.2 DNP3 Server

ECU-1152 can work as DNP3 Outstation (hereinafter referred to as DNP3 server) to exchange data with DNP3 Master of HMI/SCADA (hereinafter referred to as DNP3 client).

Users should double-click "DNP3 Outstation" under "Service" item in the left menu tree to pop up the configuration interface. The main configuration interface of DNP3 server is shown as below. Some terms appeared here should be explained:

| DNP3 Outstatio | n | | | | Apply Cancel Change |
|---|--|--|---|--|--|
| Channel | | | | | |
| Port Number: 20000 | | | | | |
| Session Status: 1 2 3 4 5 | 6 7 8 9 10 11 12 13 14 | 15 16 | | | |
| Sessions | | | | | |
| Session List: Session 1 • Enable : | iource Station: 4 Destination: 5 🔊 De | uplcate From Session1 👔 Clear Session | More Parameters | | |
| C Rinny Insut Number(RD) | Analog Input Number(AT): 8 | Counter Number(CNT): 0 | Show/Hidden Al | | |
| (I) series a start destruction of the series | L ready approximation of L | | | | |
| Binary Output Number(80): 4 | Analog Output Number(AO): 0 | Doublebit Input Number(DBI): 0 | | | |
| Binary Output Number(BO): 4 Session1 | Analog Output Number(AO): 0 | Doublebit Input Number(DBI): 0 | | | |
| Binary Output Number(BO): 4 Session1 DNP3 Point | Analog Output Number(AO): 0 | Doublebit Input Number(DBI): 0 | Event High Limit | Event Low Limit | Event Deadband |
| Sesion1 DNP3 Point BL000 | Ansign Class Class 1 | Doublebit Input Number(DBI): 0 Tog Name Double cick to edit | Event High Limit | Event Low Limit | Event Deadband |
| Grand Control (1997) Grand Control (| Analog Output Number(AO): 0 | Doublebit Input Number(DBI): 0 Tag Name Double cick to edit Double cick to edit | Event High Limit 0 0 | Event Low Limit 0 | Event Deadband -1 -1 |
| Binary Output Number(BO): 4 Session1 DMP3 Point EL000 BL003 BL002 | Analog Output Rumentou | Doublebt Input Number(DBI): 0 Teg Rame Double cick to edt Onder rick to edt Onder rick to edt | Event High Limit | Event Low Limit 0 0 | Event Deadband -1 -1 -1 |
| © Unity Duty Number(80): 4 Session1 DHP3 Point > (80,000 80,002 80,002 80,003 | Aning Output Number(AO): 0 Aning Output Number(AO): 0 Aning Class Class 1 Class 1 Class 1 Class 1 Class 1 | Doublebt Input Number(DBI): 0 Tog Barne Double cick to edt Ouuble cick to edt Ouuble cick to edt Ouuble cick to edt | Event High Limit 0 0 0 0 | Event Low Limit 0 0 0 0 | Event Deadhand -1 -1 -1 -1 |
| Unity Joint Humber(H0): 4 Sestion1 MR37 Voist KL000 KL001 KL002 KL003 KL004 KL04 | Analog Output Number(AO): 0 Analog Output Number(AO): 0 Assign Class Class 1 Clas Class 1 Class 1 Class 1 Clas Class 1 Class | Touchebe Input Number(DBD): 0 Tray Name Double cick to eath | Event High Limit 0 0 0 0 | Event Low Limit 0 0 0 0 0 0 | Event DearBand 3 4 4 4 4 4 4 4 |
| Binary Output Number(B0): 4 Session1 0800 Paweit 98000 88000 88000 88000 | Avelop Output Number(A0): 0 Avelop Output Number(A0): 0 Class 1 | Tayloride brout Number(DBD): 0 Tayloride brout Number(DBD): 0 Tayloride Color to exit Double color to exit | Event High Limit 0 0 0 0 0 0 | Event Low Limit 0 0 0 0 0 0 | Event Deadhand -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 |
| Bitary Output Number(ND): 4 Sesson1 Bitary Output Number(ND): Bitary Output Number(ND): 4 Sesson1 Bitary Output Number(ND): Bitary Output Number(ND): 4 Bitary Output Number(NUM): 4 </td <td>Ansieg Durun Romentation of Constant Co</td> <td>Doublebit Insur Number(DBD): 0 Tag Name Double click to selt Double clic</td> <td>Event High Limit 0 0 0 0 0 0 0</td> <td>Event Low Lawit 0 0 0 0 0 0 0</td> <td>Event Deadland -3 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4</td> | Ansieg Durun Romentation of Constant Co | Doublebit Insur Number(DBD): 0 Tag Name Double click to selt Double clic | Event High Limit 0 0 0 0 0 0 0 | Event Low Lawit 0 0 0 0 0 0 0 | Event Deadland -3 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4 |

Figure 4.28 DNP3 Outstation Configuration

1. Channel

It represents the media of DNP3 server to communicate with the outside. Current version of DNP3 server only supports Ethernet communication which indicates TCP/IP network communication protocol by default.

- Slave Station: It is DNP3 server address. DNP3 protocol specifies that source address and target address of DLL should be set. If users are not quite familiar with this part, please keep the default settings.
- Port Number: It is the port number of TCP/IP communication on DNP3 server. The default number is 20000.
- Session Status: There are in all 16 sessions here. When any of them is enabled, it will turn green to show its status: read-only.
- 2. Session

Here the supported number of sessions means at most 16 DNP3 clients are supported to communicate with DNP3 server at the same time. Users should set an appropriate number of sessions based on real needs to avoid extra idle sessions, so as to less burden the CPU and improve the operating efficiency of ECU-1152.

Session List: Before starting to edit a session, users should select a session from the drop-down list. The default setting is Session 1.

- Enable: Users need to tick "Enable" option to give the right to DNP3 client to access this session.
- Source Station: It is DNP3 server address.
- Destination: It is DNP3 client address. DNP3 protocol specifies that source address and target address of DLL should be set. If users are not quite familiar with this part, please keep the default settings.
- Duplicate From Session 1: When users want to configure multiple sessions which are basically similar, please click this button to clone session 1.
- Clear Session: When users make too many configuration errors, please click this button to clear the session and re-start editing. Note: This operation can't be undone, please operate with care.
- More Parameters: For advanced users who want to customize DNP3 service, please click this button to pop up "DNP3 Session Advanced Parameters Configuration" page which includes four part:
 - a.Default Variation
 - Click this tab to show the default data type of each DNP3 group. "Information" box provides the related description and remarks.

| DNP3 Session Advanced Parameters Co | nfiguration | | | |
|---|--|--|---|----|
| Default Variation Event Parameters Un | solicited Response Time Synchronization | | | |
| Binary Inputs(Group 1): | Variation 1 - packed, without status | Binary Input Events(Group 2): | Variation 3 - with Relative Time | • |
| Double-bit Binary Inputs(Group 3): | Variation 1 - packed, without status | Double-bit Binary Input Events(Group 4): | Variation 3 - with Relative Time | • |
| Binary Output(Group 10): | Variation 2 - with Status | Binary Output Events(Group 11): | Variation 1 - without Time | • |
| Binary Output Command Event(Group 13): | Variation 1 - without Time | Counters(Group 20): | Variation 5 - 32-Bit without Flag | • |
| Frozen Counters(Group 21): | Variation 9 - 32-Bit without Flag | Counter Events(Group 22): | Variation 1 - 32-Bit without Time | • |
| Frozen Counter Events(Group 23): | Variation 1 - 32-Bit without Time • | Analog Inputs(Group 30): | Variation 6 - Long Floating Point(64-bit) | • |
| Analog Input Events(Group 32): | Variation 1 - 32-Bit without Time 🔹 | Analog Input Reporting Deadband(Group 34): | Variation 2 - 32-Bit | • |
| Analog Output Status(Group 40): | Variation 2 - 16-Bit 🔹 | Analog Output Events(Group 42): | Variation 2 - 16-Bit without Time | • |
| Analog Output Command Events(Group 43) | Variation 2 - 16-Bit without Time | | | |
| i Information | | | | |
| Default Variation is used in responses when | the master does not specify a reporting variat | ion in its request. Such as request Variation 0. | | |
| | | | OK Cancel App | ły |

Figure 4.29 DNP3 Session Advanced Parameters Configuration -Default Variation

b.Event Parameters

Click this tab to configure the behavior pattern parameters of the events created by DNP3 point groups. "Information" box provides the related description and remarks.

| DNP3 Session Advanced Paramete | rs Configuration | | | | | |
|--|--|--|---------------|-----------------------------------|--------------------|-----|
| Default Variation Event Parameters | Unsolicited Response | Time Synchronization | | | | |
| Binary Input Max Events: | 100 Binary J | input Scan Period (ms): | 0 | Binary Input Event Mode: | Sequence of Events | • |
| Double-bit Input Max Events : | 100 Double | -bit Input Scan Period (ms): | 0 | Double-bit Input Event Mode: | Sequence of Events | ٠ |
| Binary Output Max Events: | 100 Binary 0 | Dutput Scan Period (ms): | 0 | Binary Output Event Mode: | Sequence of Events | • |
| Binary Output Command Max Events: | 100 Binary 0 | Output Command Scan Period (ms): | 0 | Binary Output Command Event Mode: | Sequence of Events | • |
| analog Input Max Events: | 100 Analog | Input Scan Period (ms): | 0 | Analog Input Event Mode: | Sequence of Events | • |
| nalog Output Max Events: | 100 Analog | Output Scan Period (ms): | 0 | Analog Output Event Mode: | Sequence of Events | • |
| ounter Max Events: | 100 Counte | r Scan Period (ms): | 0 | Counter Event Mode: | Sequence of Events | • |
| rozen CounterMax Events: | 100 Frozen | Counter Scan Period (ms): | 0 | Frozen Counter Event Mode: | Sequence of Events | • |
| Information Tax Events is used to set this object g then set Scan Period=0 this Object (vent Mode is used to define event st | group event Buffer, use Group will not create Ew Core mode, user can chc | r should define this parameter based (ent, unit=milisecond. lose the Event buffer mode or just re | on the hardwa | re memory limit. ted one. | | |
| | | | | ОК | Cancel Ap | ply |

Figure 4.30 DNP3 Session Advanced Parameters Configuration – Event Parameters

c.Unsolicited Response

Click this tab to choose to enable the unsolicited response function of DNP3 server based on the premise that DNP3 client actively enables this function of DNP3 server. Users can select the class (Class 1, Class 2 and Class 3) to implement this function. "Information" box provides the related description and remarks.

| 8 | DNP3 Session Ad | lvanced Parameter | s Configuration | | | | | x |
|---|-------------------|-----------------------|--------------------------|---------------------------|--------------------------|--------|---------|-------|
| | Default Variation | Event Parameters | Unsolicited Response | Time Synchronization | | | | |
| | Support Unso | licited Response | | | | | | |
| | Class 1 | | Class 2 | Class 3 | | | | |
| | i Information | | | | | | | |
| | Unsolicited Respo | onse can send just wi | hen Master Enable it, us | er can choose which class | do Unsolicited Response. | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | OK | Cancel | Apply |
| | | | | | | | CallCel | мрріу |

Figure 4.31 DNP3 Session Advanced Parameters Configuration – Unsolicited Response

d.Time Synchronization

DNP3 protocol supports time synchronization function by default. Click this tab to choose whether to enable this function on DNP3 client end. If the box is ticked, the default setting is 30 minutes, which means the synchronization will be carried out every 30 minutes. The length of synchronization time depends on the requirements of time precision in users' application. "Information" box provides the related description and remarks.

| 🔊 DNP3 Session Adv | vanced Parameters Con | figuration | | | | | x |
|--------------------|---------------------------------------|--------------------|------------------------|-------------------------|----|--------|-------|
| Default Variation | Event Parameters Uns | olicited Response | Time Synchronization | | | | |
| Synchronization P | Synchronization eriod(Minutes): 30 | | | | | | |
| i Information | | | | | | | |
| Time Synchroniza | tion Period is for Outstatic | n request Mater to | do Time synchronizatio | n for it, unit=minutes. | | | |
| | | | | | ОК | Cancel | Apply |

Figure 4.32 DNP3 Session Advanced Parameters Configuration – Time Synchronization

Users should also choose whether to show and use 6 categories of DNP3 points. The box before each category allows users to select to show or hide points in the editing interface below; while the box after allows users to set the number of DNP3 points. The studio provides 8 BIs, 8 AIs and 4 BOs by default, and all BI points are shown in the editing interface. "Show/Hide All" determines whether to show all points in each category in the editing interface, to avoid a long list which may in turn affect operation convenience of users. See the below screenshot:

| 🗹 Binary Input Number(BI): | 2 | Analog Input Number(AI): | 8 | Counter Number(CNT): | 0 | Show/Hidden All |
|----------------------------|---|---------------------------|---|------------------------------|---|-----------------|
| Binary Output Number(BO): | 4 | Analog Output Number(AO): | 0 | Doublebit Input Number(DBI): | 0 | |

Figure 4.33 DNP3 Points Setting

DNP3 point in each session should be associated with a tag. Double-click on a cell in "Tag Name" column to add a tag. After the association, the changes of "Switch0" will be sent to [BI0] of DNP3 point. Columns of "Event High Limit", "Event Low Limit" and "Event Deadband" are only effective for Analog Input; while for other columns, please keep the default settings.



Figure 4.34 Adding DNP3 Point

4.2.4.3 WASCADA Service

WASCADA protocol is a private communication protocol of WebAccess which can directly access all tags on RTU through TCP connection with the help of WACADA service, with no address mapping needed (such as Modbus service). In addition, the tags supporting periodic data storage will be capable of resuming broken transmission through WASCADA service.

WASCADA service is enabled by default. Barring special circumstances, please do not disable it. WASCADA has three configuration options:

- Port: Set the port WASCADA listens on. The default setting is 504.
- Character Encoding: Select the character encoding of WebAccess from the drop-down list. Please set it base on the real character encoding used by WebAccess, otherwise parse error may occur when it comes to a non-Chinese tag name. If WebAccess is the simplified Chinese version, please keeps the default setting "Simplified Chinese (GBK)".
- Time Zone: Select the time zone for WebAccess server. Sometimes, the time zone of WebAccess server may be different from that of RTU devices. In order to keep the consistency of data time stamp, please set the correct time zone here.

| <u>*</u> | Advantech TagLink Studio | _ _ x |
|--|--|---------------------|
| Project Help | | ○ ① |
| Create Open Close Save Project Project Downloa | Export To d SD Card ploy 2 Option 2 | |
| Project Configuration « | ₩ WASCADA(ECU-1152 1#) × | |
| Solar Communication Gateway ECU-1152 1#-10 Gata Center | WASCADA | Apply Cancel Change |
| Data Logger | General Information ☑ Enable | |
| D DNP3 Outstation WASCADA Weight EC-104 | Port: 504 Character Encoding: 简体中文(GBK) | |
| B→ Connectivity B→ System ECU-1152 2+-10.0.0.16 B→ Data Center B→ Data Logger B→ Connectivity B→ Connectivity B→ System | Time Zone: <u>(UTC+08:00)比京,重庆,香港特别行</u> | <u>我区,乌鲁木齐</u>]▼ |
| × | | |

Figure 4.35 WASCADA Service

4.2.5 Active Connection

The main application scenario of active connection: ECU-1152 can directly access SCADA center, while the latter has no direct access to the former. ECU-1152 connected via cellular wireless connection or ECU-1152 behind the firewall is such kind of situation. In this case, the traditional TCP connection created by SCADA is not applicable any more. It should be the responsibility of ECU-1152 to actively connect with SCADA which will access data in future through this connection.

The fundamentals of active connection is illustrated in the below figure. In active connection, two connections will be established: one is the connection with a service of the device over TCP port or virtual serial port, which is called upward connection; the other is the connection with SCADA center, which is called downward connection. After the establishment, active connection will perform the data forwarding between two connections. Downward connection adopts the standard TCP connection, so it can support all protocols that listen on TCP port, including Modbus TCP, NDP3, etc.; while upward connection supports two protocols: one is WhereIAm protocol, used to connect with WebAccess; the other is DTU protocol of Four Faith, used to realize the connection with the server which supports four faith DTU.



Figure 4.36 Active Connection Fundamental Function

In active connection page, the items that should be configured include upward connection protocol, downward connection service, center list of upward connection as well as some related parameters. Please follow the below steps to add an active connection:

- 1. Locate "Active Connection" in "Connectivity" in the left tree menu, and then double-click it to open the configuration page.
- 2. Click "Add" button to add an active connection.
- 3. Set the related parameters of active connection, including:
 - Protocol: Select the upward connection protocol from the drop-down list. "WebAccess WhereIAm" is used to connect with WebAccess server, while "DTU - Four Faith PROT" is used to connect with four faith DTU server. Dif-

ferent protocol requires users to set different parameters in the lower right corner of the page. For WherelAm protocol, users only need to set one parameter: "Device Identifier" which should be consistent with the device name in WebAccess project so as to make sure WebAccess can correctly identify every connected device.

- Local Service: Select the downward connection service from the drop-down list. "Modbus RTU" means to connect with Modubus RTU through the virtual serial port, while other options realize the connection through TCP connection.
- Slave Address: This item is only available when "Local Service" is set to "Modbus RTU". It specifies the slave address of Modbus RTU.
- Bind Interface: Specify the communication port of active connection. "None" means no port is blinded. This parameter is typically used when a device has multiple network connections, the data channel of active connection should be explicitly specified to avoid the uncertainties of the system default route. For example, if "Cellular" option is selected, only cellular wireless network can be applied to data transmission.
- Period (s): Set the time interval for active connection to establish a second upward connection.
- Duration (s): Set the time duration before the upward connection is disconnected. "0" means the connection will never be actively disconnected after it is established.
- Retry Count: Set the retry times after an upward connection is failed. If the count is exceeded, active connection will never try to reconnect again until the next period comes.
- Idle Time (s): After an upward connection is established, if there is no data transmission within the specified idle time, active connection will disconnect and try to reconnect. "0" means no idle time is set.
- 4. Click "+" button to add center IP and center port of the upward connection.
- 5. Enter a center IP, which can be either an IP address or a domain name address.
- 6. Enter a center port. If WebAccess is used, this item is usually set to 504 by default.
- Click "OK" button to add the center information to "Center List". Repeat steps 4~7 to add more centers. Each active connection can support at most 5 centers.
- 8. Click "OK" button to add this new connection to active connection list.

| S Project Help | T Separt To Approve - Option - | | | Adaestach Taglark Shafte | | | |
|---|-----------------------------------|---------------|--|---------------------------------|---|-----------------|---------------------|
| Project Configuration « | * Active Connection(ECU-1152 1#) | × | | | | | |
| Solar Communication Gateway GOU-1152 1#-10 | Active Connect | ion | | | | | Add Hodify Delete |
| Prot Loger Second Sec | Poteol Cr v Vheykon 39 | ListLa 1: 594 | Lod Seves Medba RU Medba RU WebAcces Week | Bed Staffice None Center Lat | Prod(c) 60 Dover Memfer(a (A-2)6-8(_) Col 1152 1 # | Refy Covet 3 | Jile Tren(s) 128 |
| Project Configuration | | 2 | | | 3). S | | |
| Crime Device | | | | | | | |

Figure 4.37 Active Connection Configuration

4.2.6 System Setting

System settings for Advantech Taglink Studio mainly include three parts: Network Setting, Time Sync Setting and GPS Setting.

4.2.6.1 Network Setting

ECU-1152 offers two ways to implement the communication between ECU-1152 and other devices: wired network and wireless network. Users should configure these two communication ways in TagLink Studio.

Wired Network Setting

ECU-1152 provides two Ethernet ports: LAN1 and LAN2. LAN1 and LAN2. In an Ethernet network, both IPv4 and IPv6 are supported, both of which allow users to enable DHCP mode or fill in a fixed IP address.

- 1. Select a port: LAN1 or LAN2
- 2. Check "DHCP" box to enable DHCP mode; Uncheck it to fill in fixed IP information. Then click "Apply" button to complete the settings.

| 5 | Advantech TagLink Studio | _ D X |
|--|------------------------------------|-----------------------|
| Project Help | | a 🕡 |
| Create Open Close Save Project Project Downlos | t Export To ad SD Card eploy | |
| Project Configuration « | Retwork Setting(ECU-1152 1#)* × | |
| Solar Communication Gateway | Network Setting | Apply Cancel Change |
| 🕒 🖏 Data Center | Wired Network Setting | î |
| Connectivity | LAN: LAN1 • | |
| ⊟- System | JPV4 | Pvo |
| - ③ Time Sync Setting | | |
| ECU-1152 2#-10.0.0.16 | Submaske | Subnet Prefix Length: |
| 🖶 🙀 Data Center | Gateway: | Gateway: |
| Connectivity | | |
| ⊕–® System | 🗢 Wi-Fi Setting | |
| | Z Enable | |
| | Network SSID: | |
| | Security: Open | • |
| | | |
| 1 | d GPRS Setting | |
| | U | |

Figure 4.38 Wired Network Setting

Wi-Fi Setting

Here, users need to input the network SSID name to access a Wi-Fi network. The network security has three options:

- 1. Open: The local area network is open, requiring no password;
- WEP: A security protocol for encrypted wireless local area network, requiring a password;
- 3. WPA/WPAS PSK: A security protocol for advanced encrypted wireless local area network, requiring a password;

| 奈 Wi-Fi Setting | | |
|-----------------|---------------------|---|
| Z Enable | | |
| Network SSID: | | |
| Security: | Open | - |
| | Open | |
| | WEP WPA/WPA2 PSK | |

Figure 4.39 Wi-Fi Setting

GPRS Setting

Check "Connect" box to enable GPRS function of ECU-1152. GPRS function allows ECU-1152 to access 2G, 3G or 4G mobile network through SIM card and to be used in wireless private network.

- 1. When "Connect" box is checked, users can select the type of wireless data terminal. During the project compiling, different scripts will be generated due to different types of the terminal device.
- 2. "Operator" provides all operators supported by the wireless terminal. After the operator is selected, users should also input APN, user name, password and phone number. However, users also can set it to "Auto", which requires no APN, user name, password and phone number. During the compiling process, a set of scripts will be generated for each operator by default, helping ECU-1152 to connect to the appropriate network based on the type of SIM card.
- 3. ECU-1152 provides two kinds of connection check types: "Ping IP/URL" and "Monitor data traffic".
- If "Ping IP/URL" is selected, users should input at least one URL which ECU-1152 will ping periodically. If ECU-1152 needs to be restarted after the connection is confirmed lost, check "Reboot system after" to restart RTU after a period of time.
- If "Monitor data traffic" is selected, ECU-1152 will affirm the connection is lost when no data is transmitted within the max. silence time.
- 4. If ECU-1152 needs to be restarted after the connection is confirmed lost, check "Reboot system after" to restart ECU-1152 after a period of time.

| Connect | EWM-C109F601E(Advantech) | • | Connect Check Type: | Ping IP/URL | |
|---------------|--------------------------|---|---------------------|-------------|-------|
| Operator: | China Mobile | • | Ping URL1: | | |
| Network Type: | 2G Only | • | Ping URL2: | | |
| APN: | CMNET | | Ping URL3: | | |
| User Name: | | | Retry Interval(s): | 600 | |
| Password: | | 6 | Reboot system after | 0 | hours |
| Phone Number | *99***1# | | | | |

Figure 4.40 GPRS Setting

4.2.6.2 Time Sync Setting

Users can perform the time synchronization settings, making ECU-1152 time consistent with another time source. Meanwhile, users can also set RTU as a time synchronization source. The specific procedures are as follows?

- 1. Double-click or right-click on "Time Sync Setting" of "System" in the left tree menu to open the configuration page.
- 2. Check "Synchronize with NTP Server" to make RTU synchronized with another time source which could be a domain name or an IP address.
- 3. Check "Enabled as a NTP Server" to make RTU as a time synchronization source allowing other devices to synchronize with it.

| 5 | Advantech TagLink Studio | - - X |
|---|--|---------------------|
| Project Help | | ⇔ (1) |
| Create Open Close Project Project Project Close Downko | t Export To Show Tag Count Deploy Option | |
| Project Configuration « | () Time Sync Setting(ECU-1152 1#)* × | |
| Solar Communication Gateway EU-1152 1#-10 Genter | Time Sync Setting | Apply Cancel Change |
| Data Logger Z Service | 2 MTP Time Sync | |
| Connectivity System Network Setting O Time Sync Setting Setting | Synchronize with NTP Server: time.windows.com Enabled as a NTP Server | |
| ECU-1152 2#-10.0.0.16 | GPS Time Sync | |
| Data Logger Zervice Connectivity | Synchronize with GPS | |
| ⊕-to) System | Campace interval(5). | |
| | | |
| | | |
| 1 | | |
| | | |

Figure 4.41 Time Sync Setting

4.3 Advantech Tag Link Online Functions

Advantech Taglink supports online device operations, such as adding, searching and clearing device online; seting password online. This password is used for project download and online login; monitoring device status, including read/write action of tag value, IO status and system information; changing IP address of ECU-1152.

4.3.1 Online Configurations

Advantech Taglink supports online configuration of ECU-1152, such as adding device, searching device, clearing device and password setting.



Figure 4.42 Online Configurations

Users can change IP address and subnet mask of the online device through Taglink Studio. For example, when two LANs of ECU-1152 have been set to DHCP mode (which will assign IP dynamically) and there is no server in the network can provide DHCP server, ECU-1152 can be searched but cannot be accessed via IP address. In this case, users can set a temporary IP address of ECU-1152 to perform the necessary operations, such as project download.



The setting will not be ineffective until the restart. After the restart, RTU will set the status of LAN based on the configuration file.

- 1. Right-click on the online device that has been searched and select "IP Setting" to show the pop up box.
- 2. In "IP Setting" box, users should firstly select a LAN, and then input the new IP address and subnet mask.

4.3.2 Online Monitor

Online monitoring mainly supports the following functions: monitoring all tags on the device, including tag value, online status and time stamp; monitoring IO status, including the setting and read status; monitoring system status, in including GPRS status and image information. Besides, online image update is also supported.

4.3.2.1 Tags

ECU-1152 online operations support the get and set functions of the tag Different tags may have different tabs: System Tag; IO Tag; User Tag and Calculation Tag.

1. System Tag

Here, users can read system tags. The number of rows to be displayed in tag list is 10 by default. Users can also set it t 20 or 50. The tag list applies paged display. Users can click the number buttons or arrows in the lower right corner of the page to view other tags.

| N Tags | | | | | |
|--|------------|---------|----------------------|--|--|
| System Tag IO Tag User Tag Calculation Tag | | | | | |
| System Tag | | | | | |
| | | | | | |
| Tag | Value | Quality | Timestamp | | |
| #SYS_UPTIME | 11144 | Good | 5/18/2016 4:56:43 PM | | |
| #SYS_CURRENT_TIME | 1463561803 | Good | 5/18/2016 4:56:43 PM | | |
| #SYS_CPU_FREQ | 629145600 | Good | 5/18/2016 1:51:34 PM | | |
| #SYS_MEM_SIZE | 495.93 MB | Good | 5/18/2016 1:51:34 PM | | |
| #SYS_CPU_USED | 11.01% | Good | 5/18/2016 4:56:42 PM | | |
| #SYS_MEM_USED | 12.28% | Good | 5/18/2016 4:56:40 PM | | |
| #SYS_TFCARD_CAPACITY | 954.00 MB | Good | 5/18/2016 1:51:34 PM | | |
| #SYS_TFCARD_FREE_SPACE | 80.54 MB | Good | 5/18/2016 2:10:10 PM | | |
| #SYS_SDCARD_CAPACITY | 0 Bytes | Good | 5/18/2016 1:51:34 PM | | |
| #SYS_SDCARD_FREE_SPACE | 0 Bytes | Good | 5/18/2016 1:51:34 PM | | |
| Showing 1 to 10 of 25 rows 10 - records per page | | | << < 1 2 3 > >> | | |

Figure 4.43 Online Monitor – System Tag

2. IO Tag

In this tab, users can read and set IO tags:

- a. Select a tag row to be modified from the tag table. Then the tag name will appear in "Tag Name" box above the table.
- b. Fill in a tag value in "Tag Value" box.
- c. Click "Submit" button.

```
Note!
```

Only when users have logged in the studio, all the setting will take effect. Please click "Login" button first.

| System Tag IO Tag | User Tag Calc | ulation Tag | | |
|---|---|--|--|--------|
| O Tag | | | | |
| Таг | g Name | | Tag Value | |
| | | | | Submit |
| | Value | Quality | Timestamp | |
| ag | | | | |
| urrent | 0.00 | Device Error | Thu Jan 01 1970 08:00:00 GMT+0800 (中国标准时间) | |
| ag urrent Displacement | 0.00 | Device Error Comm Error | Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) | |
| ag urrent Nisplacement witch1 | 0.00 | Device Error Comm Error Device Error | Thu Jan 01 1970 06 00.00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00.00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00.00 GMT+0800 (中国标准时间) | |
| ag urrent isplacement witch1 oitage | 0.00 0.00 0.00 0.00 | Device Error Comm Error Device Error Device Error | Thu Jan 01 1970 06 00.00 GMT+0600 (中国标准的间) Thu Jan 01 1970 06 00.00 GMT+0600 (中国标准时间) Thu Jan 01 1970 06 00.00 GMT+0600 (中国标准时间) Thu Jan 01 1970 06 00.00 GMT+0600 (中国标准时间) | |
| ag urrent Nisplacement witch1 Ioltage witch2 | 0.00 0.00 0 0.00 0 | Device Error Comm Error Device Error Device Error Device Error | Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准的) 1 Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) | |
| ag urrent witch1 oltage witch2 witch3 | 0.00 0.00 0 0.00 0 0 | Device Error Comm Error Device Error Device Error Device Error Device Error | Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) 1 Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 08 00:00 GMT+0800 (中国标准时间) | |
| ag urrent Visplacement Witch1 Soltage Witch2 Witch3 Witch4 | 0.00 0.00 0.00 0.00 0.00 0 0 0 | Device Error Comm Error Device Error Device Error Device Error Device Error Device Error | Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准的) 1 Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) Thu Jan 01 1970 06 00:00 GMT+0800 (中国标准时间) | |

Figure 4.44 Online Monitor – IO Tag

3. User Tag

In this tab, users can read and set user tags, the setting method is the same with IO tag.

4. Calculation Tag

In this tab, users can read and set calculation tags, the setting method is the same with IO tag.

4.3.2.2 System Information

ECU-1152 online functions also provide some related system information and online image update.

1. GPRS Information

GPRS information tab displays all GPRS related information, including: Mobile Network Operator, Mobile Network Type, Mobile Phone Number, Mobile Data Traffic, Signal Quality and Public IP, as the following picture shows.

... System Information GPRS Information System Log Image Inf GPRS Info Mobile Network Operator Mobile Network Type Mobile Phone Number Mobile data traffic Signal quality Public IP No GPRS Service No GPRS Service Not Connected(0) 0.0.0.0 0 Bytes << 1 > >> ving 1 to 1 of 1 rows

Figure 4.45 Online Monitor - GPRS Information

2. System Log

Here, it will show all the log information of the monitoring ECU-1152.

| J System Information |
|--|
| |
| |
| CPPS Information System Log Image Information |
| OF YO INTO INDUCING OF YOU INTO INDUCT |
| |
| System Log |
| -) |
| May 20 15.14.24 ecu1152 user info AdvAgentMain: broadcast if eth0.nodeid.10 |
| May 20 15 14 24 ecu1152 user info AdvAgentMain: broadcast if, nodeid:10 |
| May 20 15:14:23 ecu1152 user.info AdvAgentMain: broadcast if.eth0.nodeid:10 |
| May 20 15:14:23 ecu1152 user.info AdvAgentMain: broadcast if.,nodeid:10 |
| May 20 15:13:11 ecu1152 daemon.info udhcpc[2382]: No lease, falling |
| May 20 15:13:08 ecu1152 daemon.info udhcpc[2382]: Sending discover |
| May 20 15:13:05 ecu1152 daemon.info udhcpc[2382]: Sending discover |
| May 20 15:13:02 ecu1152 daemon.info udhcpc[2382]: Sending discover |
| May 20 15:13:02 ecu1152 daemon.info udhcpc[2382]: udhcpc (v1.22.1) started |
| May 20 15:13:02 ecu1152 daemon info udhcpc[2131]. No lease, failing |
| May 20 15:12:59 ecu1152 daemon.err ifplugd(eth0): exit code: 1 |
| May 20 15:12:59 ecu1152 daemon info udhcpc[2131]: Sending discover |
| May 20 15:12:56 ecu1152 daemon.info udhcpc[2131]. Sending discover |
| May 20 15:12:54 ecu1152 user.notice ActiveConnection, enter main loop |
| May 20 15/12/54 ecu11b2 user notice ActiveConnection: start all links |
| May 20 15:12:54 ecu1152 user ert ActiveConnection: load_actconn_ctg. load module/nome/root/bin/acm_V/hereiAm.so |
| May 20 15:12:54 ecu1152 User Indice Webservice: main: loading coming me informerorouterproject/webservice acr |
| May 20 15.12:55 exciting Adversaria (declarational) and the state and th |
| may control 2.55 excitations and section agricultural data and a static section and a static section agricultural section agricultura section agricultural section agricultural section agricultural s |
| may 20 15, 2:35 euclists induce modulosization, circle main roup |
| May 20 151-255 equili52 service Modulation monormatic disconneted (ModusDaemon, 2173) onen IPC failed |
| Nav 20 15 12 53 ecu1152 user noice ModbusDaemon create servers |
| Nav 20 15 12 53 ecu 1152 user nolice ModbusDaemon, start poling |
| May 20 15 12 53 ecu1152 user notice ModbusDaemon: create data mapping list |
| May 20 15 12 53 ecu1152 user notice ModbusDaemon: mbdo_init |
| r |

Figure 4.46 Online Monitor – System Log

3. Image Information

Image Information tab displays both system and software version information of the current device, meanwhile allows users to update firmware and software online.

a. Information Display

System version information of the current device is shown as below:

| tem | RTU Version Info | Current Version Info | Description |
|-------------------|---|----------------------|-------------|
| ILO | | | |
| m335x-ecu1152.dtb | | | |
| amdisk.gz | | | |
| -boot.img | U-Boot 2013.01.01R0002-svn6061 | 9 | |
| image | Linux-3.12.10-rt15-ti2013.12.01 | 9 | |
| otfs.tar.gz | ECU-1152-R11AAE image version 1.2.1 Release May 13 2016 | S | |

Figure 4.47 Online Monitor – System Version Information

App & Lib version information of the current device is shown as below:

| App & Lib Version Info | | | | |
|----------------------------|------------------|---|----------------|--|
| Item | RTU Version Info | Current Version Info | Description | |
| wdtd | 1.2.1 rev 6144 | - | | |
| AdvSystemSetting | 1.2.1 rev 6072 | - | | |
| GPRSTrafficMonitor | 1.2.1 rev 6072 | - | | |
| AdvUserTag | 1.2.1 rev 6072 | | | |
| AdvAgentMain | 1.2.1 rev 6072 | - | | |
| AutoDiatup4G | 1.2.1 rev 6072 | - | | |
| AdvBurninTest | 1.2.1 rev 6072 | - | | |
| WAScadaServer | 1.2.1 rev 6072 | - | | |
| DataCollector | 1.2.1 rev 6072 | | | |
| DataLogger | 1.2.1 rev 6072 | - | | |
| Showing 1 to 10 of 64 rows | | <c <<="" td=""><td>1 2 3 4 5 > >></td></c> | 1 2 3 4 5 > >> | |

Figure 4.48 Online Monitor – App & Lib Version Information

b. Image Update

| N | 0 |) | t | e | ļ |
|---|---|---|---|---|---|
| | - | I | 2 | à | |

This operation is only available when users have logged in Taglink Studio.

- Click "Load File" button to select the bin package to be updated.
- Click "Upload" button to upload the file.
- The upload process will take about 2 minutes.
- After the file has been successfully uploaded, click "Update" button to start image updating.
- After the updating, ECU-1152 will restart. Then, "ECU-1152 boot successful" message will pop up to indicate a successful reboot.

| <u>/5</u> | Advantech TagLink Studio | _ D X |
|---|--|-------------------|
| Online Help | | ۵ 🕲 |
| Heb About | | |
| Online Device « | Online Monitor(ECU-1152 _1#) × | |
| ☐ Online Device [10]ECU-1152 _1# - 10.0.0.10 | ECU-1152-R11 | 2 root~ |
| | I System Information | 22 |
| | GPRS Information System Log Image Information | |
| | Image Update | |
| | ECU1152_Linux_TagLink_1.2.1_Release_#109.bin Load File 2 | ✓Upload ✓Update 3 |
| | Upload Complete | |
| | Please check version info | |
| × 📮 - | System Version Info | |
| | | |

Figure 4.49 Online Monitor – Image Updating



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