

Field Communication Software Model: CFS100

Instruction Manual (Smart ALTJ3000 Immersion-type Liquid-Level Device Edition)



Azbil Corporation

NOTICE

While the information in this manual is presented in good faith and believed to be accurate, Azbil Corporation disclaims any implied warranty of merchantability or fitness for a particular purpose and makes no express warranty except as may be stated in its written agreement with and for its customer.

In no event shall Azbil Corporation be liable to anyone for any indirect, special or consequential damages. This information and specifications in this document are subject to change without notice.

Instruction Manuals

Safety-related precautions, general operating procedures, and other general information related to Model CFS100 (CommStaff) can be found in the Common Edition manual (No. CM2-CFS100-2001). For information on the operation of a device used with Model CFS100, consult the manual for that particular device.

The Common Edition manual for Model CFS100, as well as the manuals for individual devices, are included in electronic form (as PDF files) on the CommStaff installation CD-ROM

Devices Covered by This Manual

This manual pertains to Smart ALTJ3000 Immersion-type Liquid-Level Device with the model number pattern JTL.

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Chapter 1. Overview

1-1. Introduction

Model CFS100 (CommStaff) is a tool for communicating with Azbil Corporation's smart field devices (DSTJ and others) that enables configuration of device settings. It is a software product that operates on Windows PCs. CommStaff communicates with Azbil Corporation's smart field devices using a USB interface connected to a Windows PC, which is then connected by communications cable to the USB port of a device.

For information on the specifications common to all types of devices and information on how to install CommStaff, please refer to the main Model CFS100 Operation Manual. *Before reading this manual, make sure to read the main Model CFS100 Operation Manual thoroughly.*

For information on smart transmitter functions and method of connection, refer to manual No. OM2-5380-3100, Smart ALTJ3000 Immersion-type Liquid-Level Transmitter Model: JTL220/230/221/231/222/232 User's Manual

1-2. Important Notes

- * When changing connected devices

CommStaff continues communicating with the device when displaying dynamic values, such as pressure, so that it can continuously update these values. If you remove the communications cable to change the device during this communication, an error will occur.

Exit CommStaff before detaching the communications cable from the device, and then start CommStaff again after connecting the communications cable to the new device.

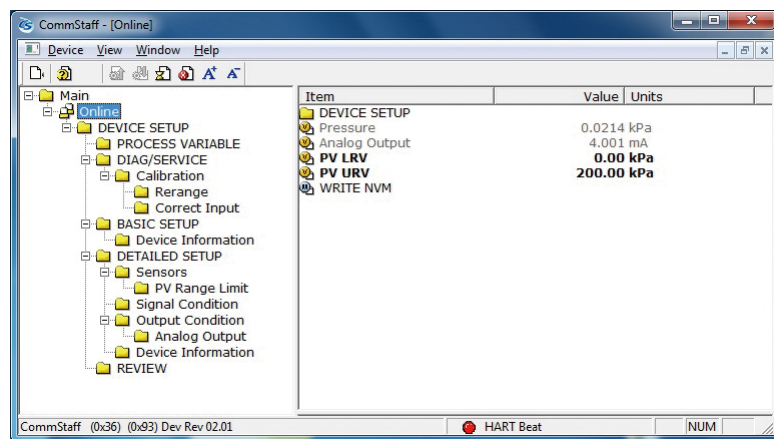
- * The use of SFN communication changes the transmission signal, so be sure to switch the process control loop to manual mode beforehand.
- * Refer to section 7.4 of CM2-CFS100-2001, the common edition manual.

Chapter 2. Configuration

2-1. Menu List

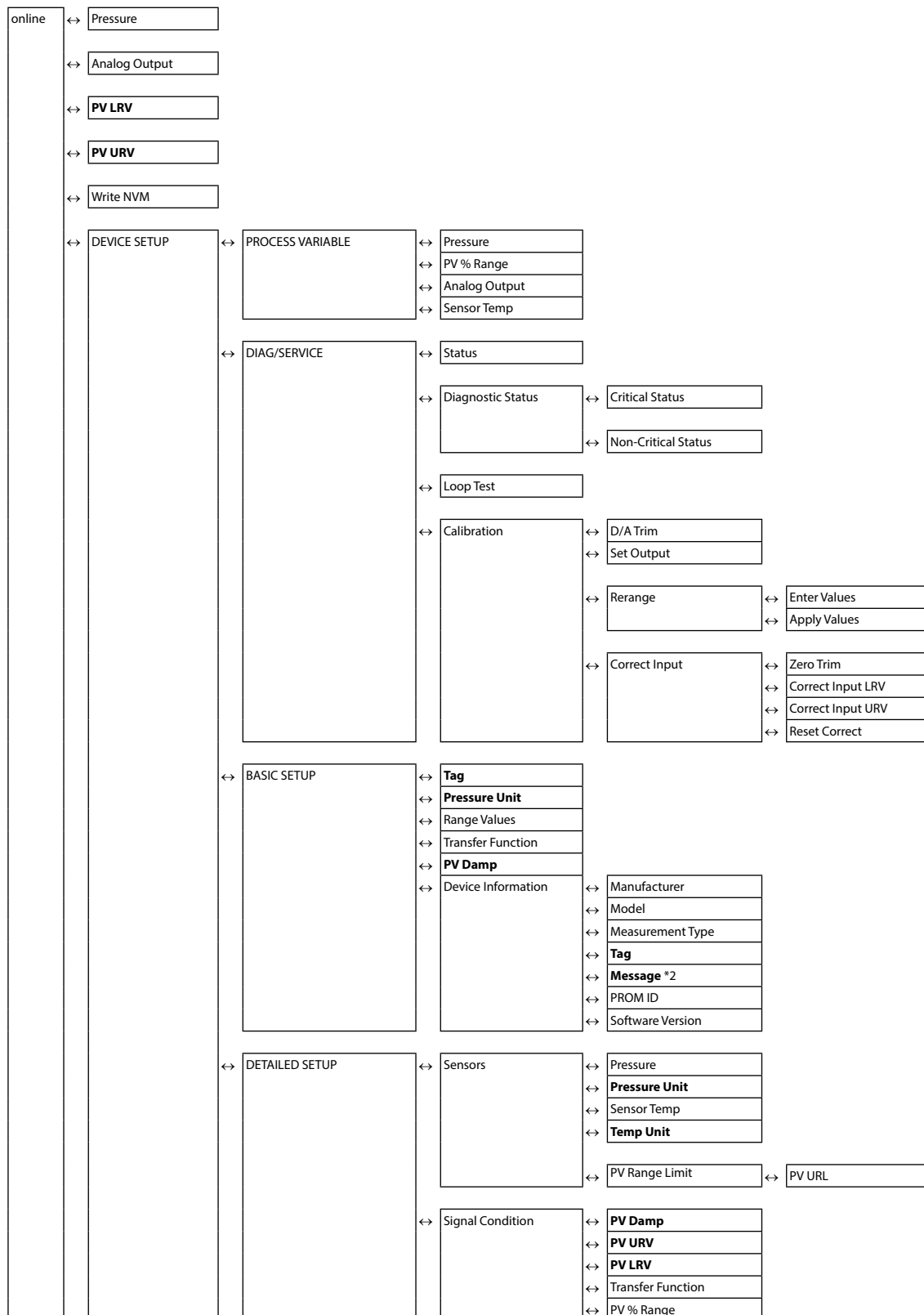
Right-clicking “Online” in the menu tree in the left pane of the CommStaff application window displays a menu. Selecting Expand on the menu displays the expanded menu tree.

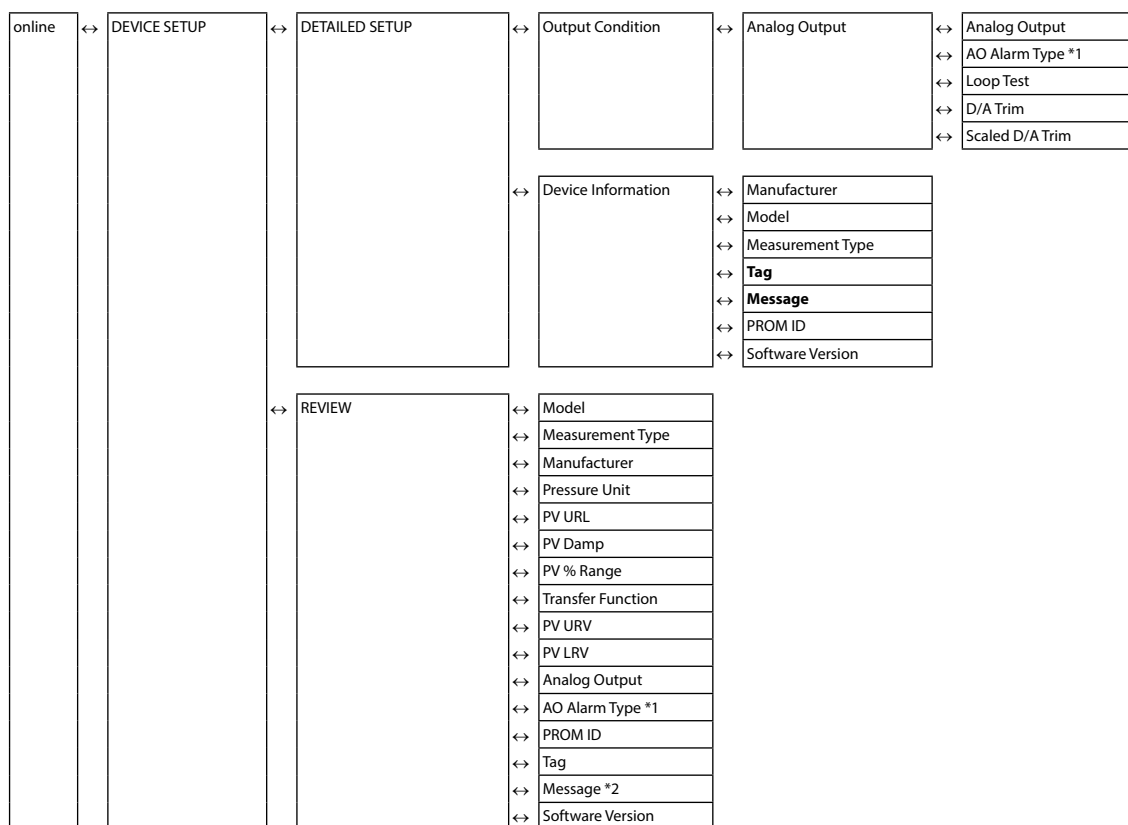
Parameters displayed in gray (Pressure and Analog Output in the following window) in the parameter display in the right pane are parameters that cannot be changed. Those displayed in black (PV LRV and PV URV in the window below) are parameters that can be changed.



The following gives details of the menus displayed in the menu tree.

Bold items are parameters that can be changed.





*1 Displays the burnout direction.

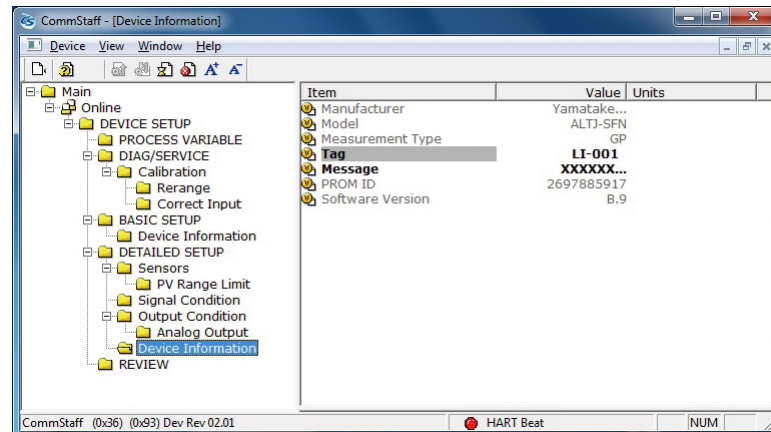
*2 Displayed if the transmitter version is 6.5 or higher.

Setting items and references

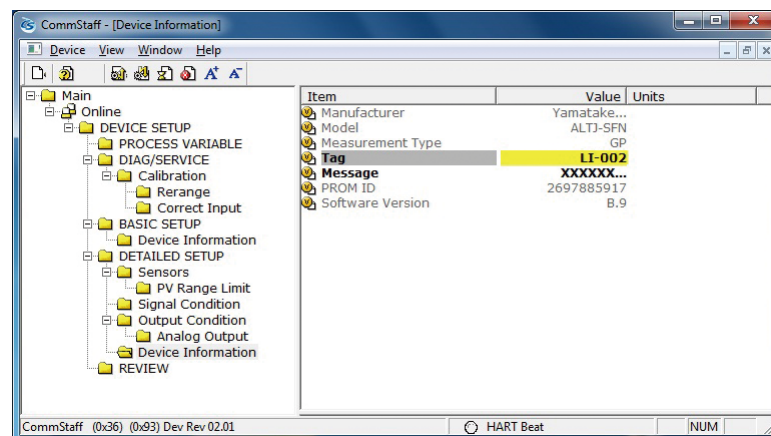
| | Task | Parameter | Section of Manual |
|--------------------------|-------------------------------------|---------------|-------------------|
| Preparation, Adjustment" | Tag No., set or check | Tag | 2.2 |
| | Measurement range, check or change | Basic Setup | 2.4 |
| | Damping time constant, check or set | Damping | 2.5 |
| | Units of pressure, check or change | Pressure Unit | 2.3 |
| | Zero adjustment, execute | Apply value | 3.2 |
| | Loop test, execute | Loop Test | 3.1 |
| Maintenance | Calibrate | Correct Input | 4.2 |

2-2. Tag Number Configuration

This section explains how to input or change the tag No. In the menu tree in the left pane, select DEVICE SETUP → DETAILED SETUP → Device Information → Tag.



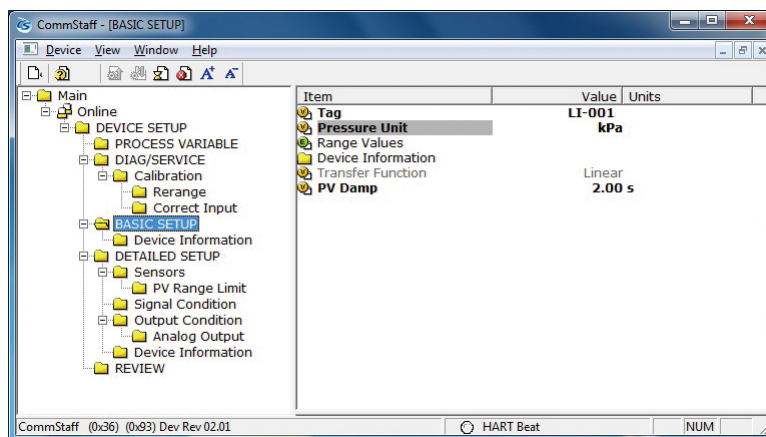
Double-clicking Tag displays the settings screen. On this screen, set the Tag and click the Set button. The tag is highlighted in yellow. Click the Send button to send the new Tag to the device.



2-3. Selecting a Unit of Pressure

This function allows you to select the measurement units for pressure used by the device. Although the configured units for pressure can be changed, the changed settings are not saved by the device. At the next reconnection, measurements are displayed in the default units for pressure, that is, kPa or MPa, not in the changed units.

Select DEVICE SETUP → BASIC SETUP → Pressure Unit.



Units for pressure can be selected from the following.

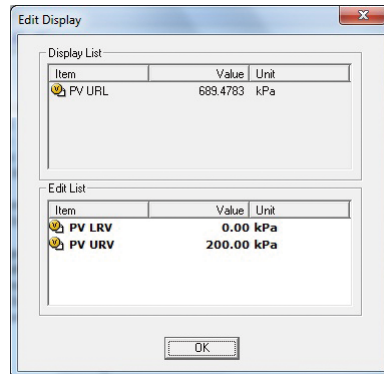
Note: If the ALTJ is used in Japan, the selected units should be part of the standard international system (SI units).

| | | | | |
|-------|------|--------|---------|-----|
| inH2O | inHg | mmH2O | mmHg | psi |
| bar | mbar | g/Sqcm | kg/Sqcm | Pa |
| kPa | MPa | | | |

2-4. Measurement Range Configuration

This section explains how to configure the measurement range of the device.

Select DEVICE SETUP → BASIC SETUP → Range Values.



LRV: Value at which 4 mA is output

URV: Value at which 20 mA is output

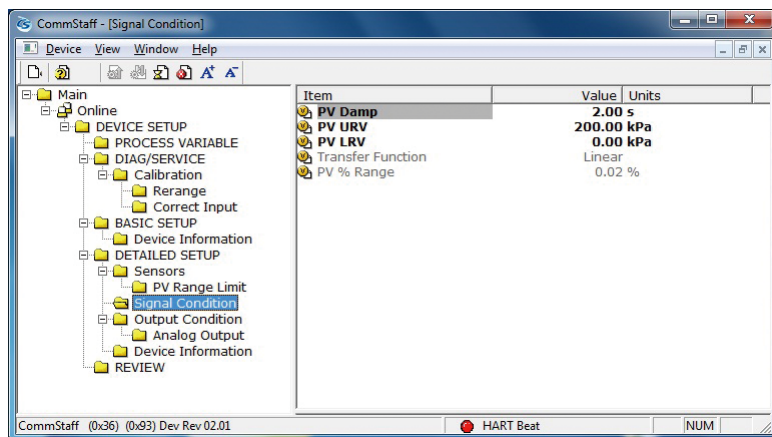
Double-clicking LRV or URV displays the settings screen. After configuring the measurement range, close the edit screen and click the Send button to send the measurement range value to the device. Values can be input to two decimal places.

Note: In SFC and CommPad, when the LRV is changed, the URV also changes by the same amount in order to keep SPAN unchanged. In CommStaff, when LRV is changed, URV does not change.

2-5. Damping Time Constant Configuration

This section explains how to configure the damping time constant.

Select DEVICE SETUP " DETAILED SETUP " Signal Condition " PV Damp.



Set a value in the range of 0 to 32 seconds.

The following values can be input. If a value other than the following is input, the closest value is automatically selected.

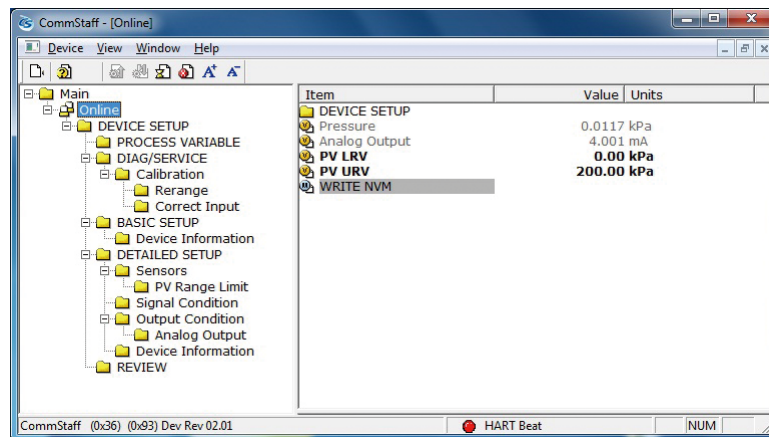
Unit: sec.

| |
|------|
| 0.0 |
| 0.16 |
| 0.32 |
| 0.48 |
| 1.00 |
| 2.00 |
| 4.00 |
| 8.00 |
| 16.0 |
| 32.0 |

2-6. NVM Save

The device saves configured data in nonvolatile memory 30 seconds after it is sent to the device. If the device power is turned off in less than 30 seconds, configuration data that has been sent will be lost, and the existing saved data will remain in the device. To avoid this, NVM Save can be used.

Select the “Online” menu at the top of the menu tree and execute WRITE NVM. This allows configuration data that has been sent to be saved in nonvolatile memory so that the device power can be turned off.



Chapter 3. Preparations and Starting Operation

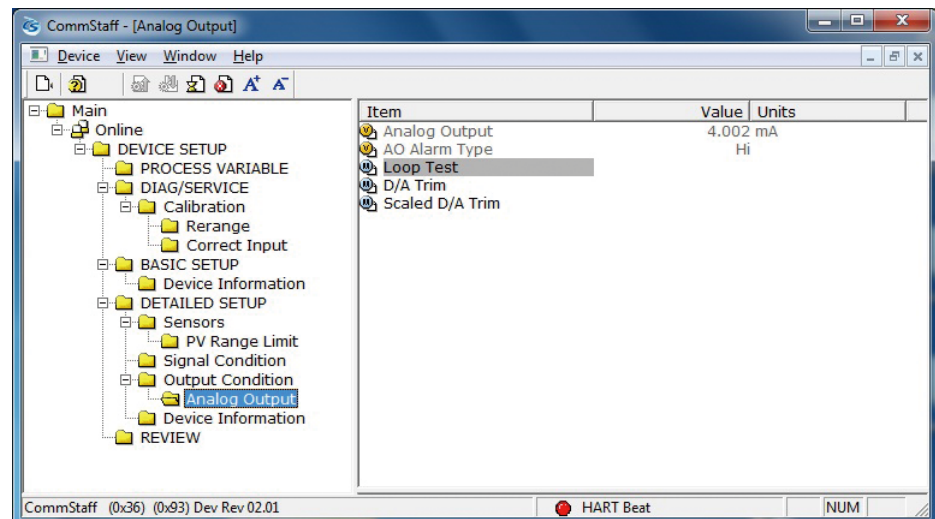
This chapter explains how to prepare for device operation, and provides general instructions to follow when starting device operation.

3-1. Confirmation of Output Signals (Loop Test)

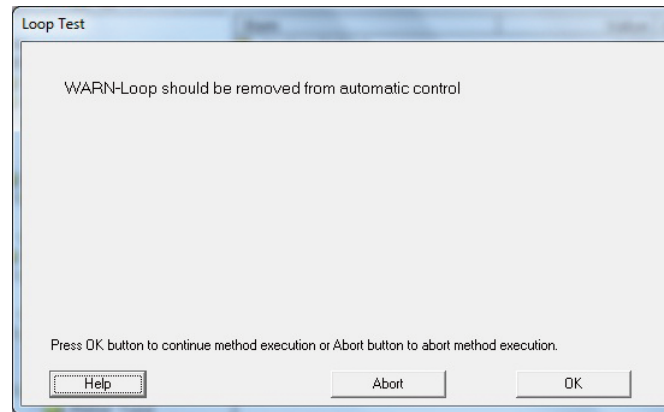
By putting the device in constant current mode, you can keep current outputs constant in the range of 4 - 20 mA. This section explains how to configure the constant current mode and how to return to normal output mode.

Select DEVICE SETUP → DETAILED SETUP → Output Condition → Analog Output → Loop Test.

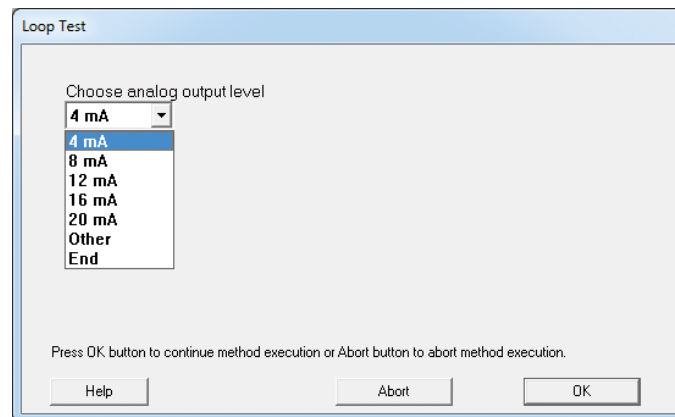
Caution: If this operation is performed while the device process is under automatic control, outputs may fluctuate, making device operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.



Double-clicking Loop Test displays the following screen.



Click OK if there are no problems. The screen changes to the following.



Select 4 mA and click OK. Output signals will be fixed at 4 mA (0%).

Select 8 mA and click OK. Output signals will be fixed at 8 mA (25%).

Select 12 mA and click OK. Output signals will be fixed at 12 mA (50%).

Select 16 mA and click OK. Output signals will be fixed at 16 mA (75%).

Select 20 mA and click OK. Output signals will be fixed at 20 mA (100%).

To input a different value, select Other and Click OK.

If you select End and click OK, a message is displayed notifying you that normal output mode will resume.

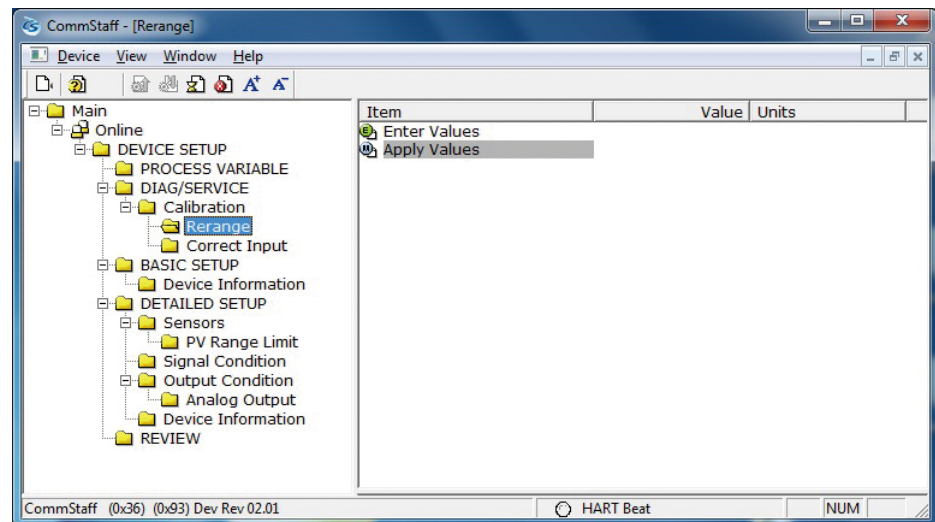
3-2. Range Configuration (Zero and Span Adjustments) according to Input Pressure

The range can be configured so that the current pressure input into the device becomes 4 mA (0%) or 20 mA (100%).

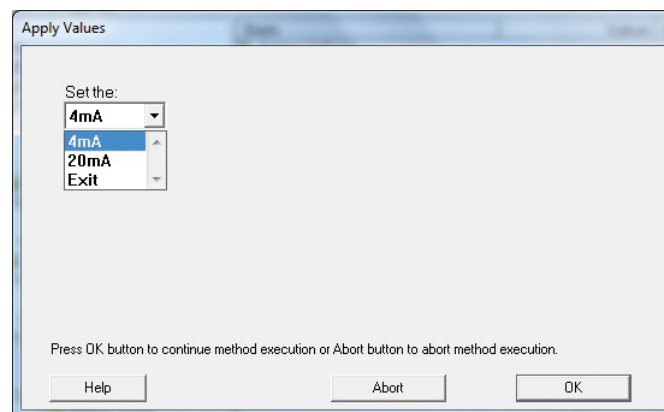
CAUTION: If this operation is performed while the device process is under automatic control, outputs may fluctuate, making device operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

The following describes how the range can be changed according to input pressure.

Select DEVICE SETUP → DIAG/SERVICE → Calibration → Rerange → Apply Values.



Double-click Apply Values, and a warning is displayed first and then the following screen.



- Select 4 mA and click OK.

The range is reconfigured so that the current input pressure becomes the 4 mA output pressure (zero adjustment).

- Select 20 mA and click OK.

The range is reconfigured so that the current input pressure becomes the 20 mA output pressure (span adjustment).

- Select Exit and click OK.

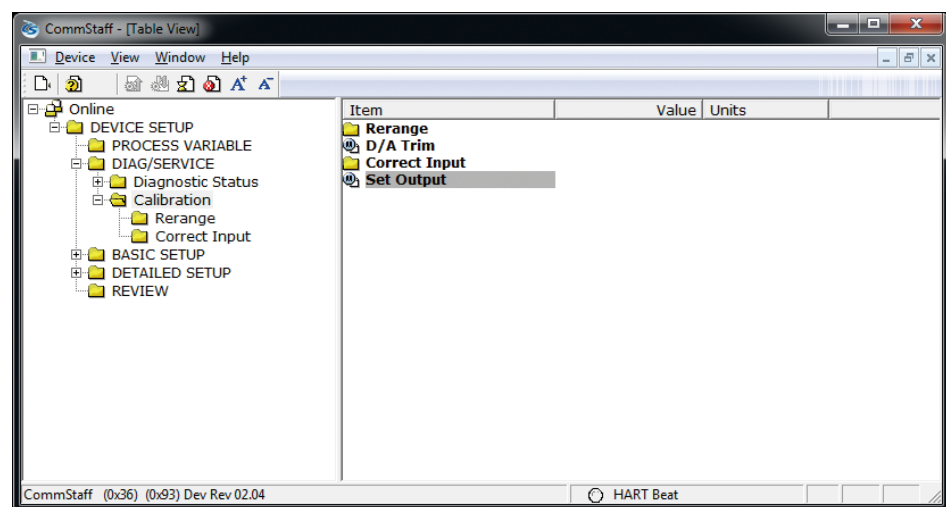
This completes the configuration process.

3-3. Zero Adjustment Based on Actual Level During Liquid Level Measurement

CAUTION: If this operation is performed while the process is under automatic control, outputs may fluctuate, possibly creating a dangerous situation. Before performing this operation, make sure that you switch the process control loop to manual control.

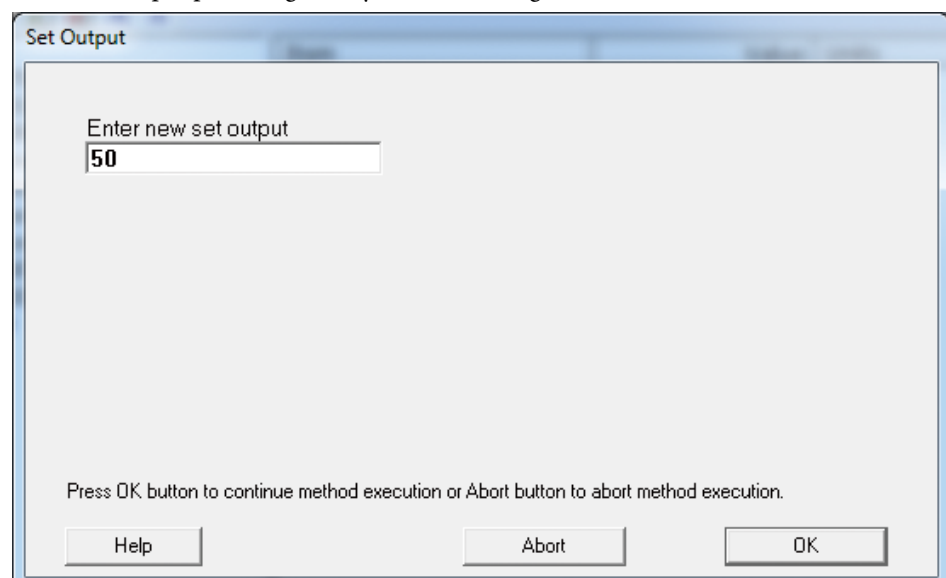
This section explains how to adjust the LRV to a specific value so that the actual present level will be measured as the desired LRV. Perform this adjustment when you want to set the present tank level to a specific value, for example, 50%.

- [DEVICE SETUP] → [DIAG/SERVICE] → [Calibration] → [Set Output]

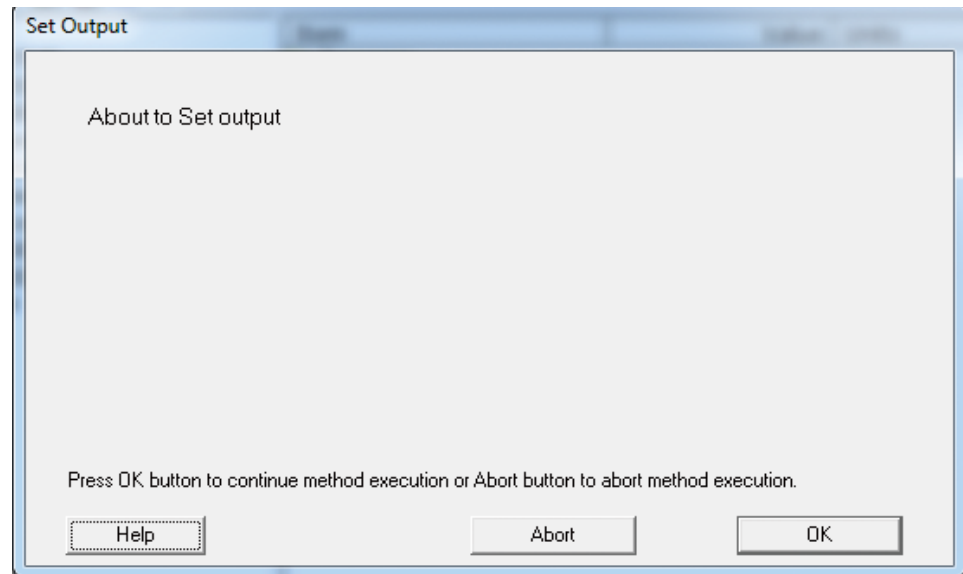


A warning that the loop should be switched from automatic control to manual mode is displayed (WARNING: Loop should be removed from automatic control). After switching to manual mode, click OK.

Enter the output percentage that you wish to assign and Click OK



Click OK if there are no problems.



The LRV will be shifted so the present level will be measured at the output you have specified.

The URV will also be changed so that the span remains the same.

The "Loop may be returned to automatic control" It is now safe to switch the loop back to automatic control. Click OK.

Chapter 4. Maintenance

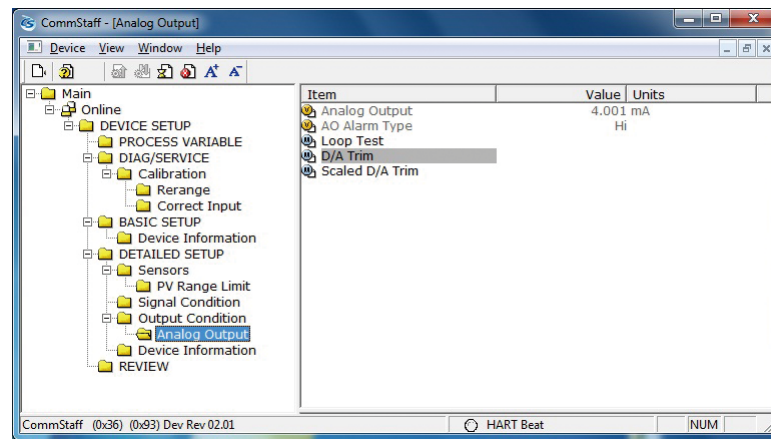
This chapter explains how to calibrate the analog signals of the device, how to calibrate the measurement range, and how to reset a calibrated value to the default value. It also explains how to check the device's self-diagnostic messages.

4-1. Calibration of Analog Outputs

By connecting to an ammeter and comparing measured values, you can calibrate the 0% and 100% analog outputs.

Select DEVICE SETUP → DETAILED SETUP → Output Condition → Analog Output → D/A Trim.

CAUTION: If this operation is performed while the device process is under automatic control, outputs may fluctuate, making device operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.



| Step | Operation and indication |
|------|--|
| 1 | <p>Double-click D/A Trim.</p> <p>WARN - Loop should be removed from automatic control</p> <p>A warning that the loop should be switched from automatic control to manual mode is displayed. After switching to manual mode, click OK.</p> <p>“Connect reference meter” is displayed. Connect the loop to an ammeter (mA) or voltmeter. (It is recommended that an ammeter or voltmeter with an accuracy of 0.03% or better be used.)</p> |
| 2 | <p>The following messages are displayed in the order given.</p> <p>Setting fld dev output to 4mA (about to set device output to 4 mA)</p> <p>Click OK if there are no problems.</p> <p>Enter meter value (input the ammeter reading).</p> <p>Input the reading of the ammeter and click OK. This allows the adjustment command to be sent to the device.</p> <p>Fld dev output 4.000mA equal to reference meter? (is the device output equal to the reading on the connected ammeter?)</p> <p>If the device output is not equal to the reading of the ammeter, select No and click OK. This allows the adjustment process to continue.</p> |
| 3 | <p>Next do the 20 mA calibration.</p> <p>The following messages are displayed in the order given.</p> <p>Setting fld dev output to 20mA (about to set device output to 20 mA)</p> <p>Click OK if there are no problems.</p> <p>Enter meter value (input the ammeter reading)</p> <p>Input the reading of the ammeter and click OK. This allows the adjustment command to be sent to the device.</p> <p>Fld dev output 20.000mA equal to reference meter? (is the device output equal to a reading of the connected ammeter?)</p> <p>If the device output is not equal to the reading of the ammeter, select No and click OK. This allows the adjustment process to continue.</p> <p>Finally, a message is displayed notifying you that this will return operation to normal measurement mode and that the 20 mA calibration process is complete.</p> |

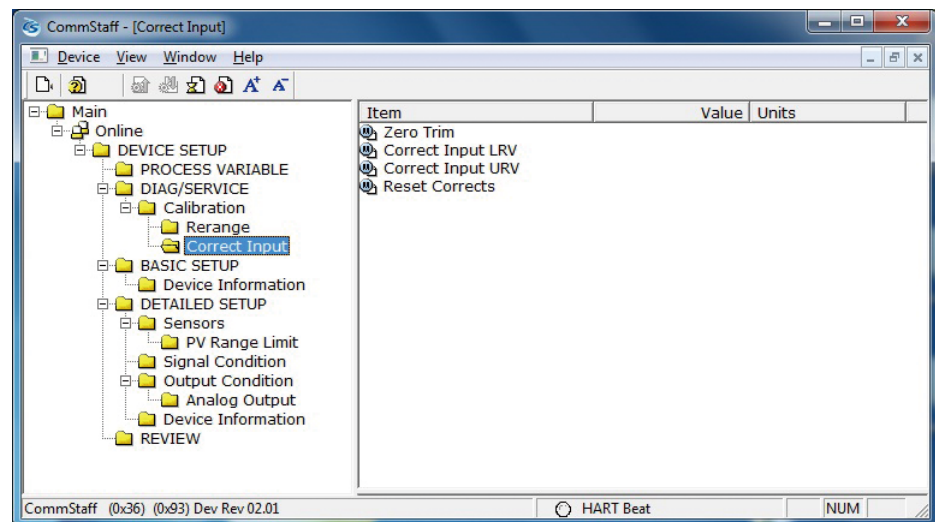
4-2. Measurement Range Calibration according to Actual Pressure

For the SMART ALTJ3000 immersion-type liquid-level devices, the measurement range must be calibrated at two points, namely the LRV (input value at 0% output) and URV (input value at 100% output).

This calibration is done when calibrating actual pressures using a standard pressure device. For further details, refer to Chapter 3-6, “Calibration” in OM2-5380-3100 for Smart ALTJ3000 Immersion-type Liquid-Level Device.

CAUTION: If this operation is performed while the device process is under automatic control, outputs may fluctuate, making device operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

Select DEVICE SETUP → DIAG/SERVICE → Calibration → Correct Input.

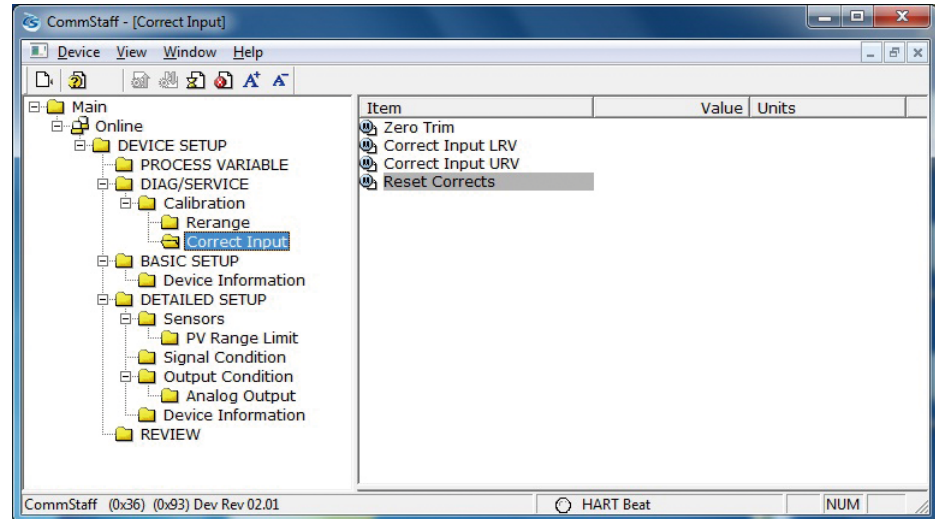


- To calibrate the LRV value, double-click Correct Input LRV. To calibrate the URV value, double-click Correct Input URV.
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.
- “Apply LRV pressure” or “Apply URV pressure” is displayed. If the value of the standard pressure generator is equal to LRV (0%) or URV (100%), click OK.
- “Press OK when pressure is stable” is displayed. After confirming that input pressure has stabilized, click OK.
- The “Note - Loop may be returned to automatic control” message is displayed to notify you that you can now switch back to automatic control. Click OK.

4-3. Calibrated Value Reset

This operation is for resetting the calibrated zero-span value. Since the calibrated value is deleted, you must recalibrate following the steps described in 4.2.

Select DEVICE SETUP → DIAG/SERVICE → Calibration → Correct Input → Reset Corrects.

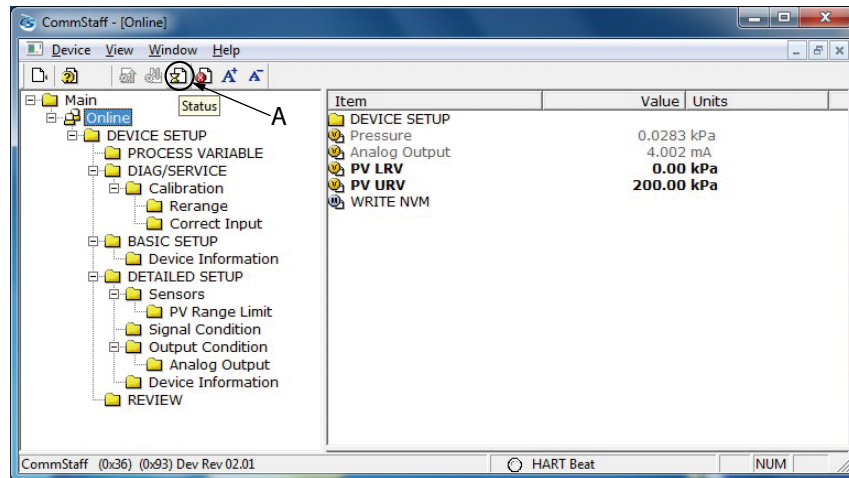


CAUTION: If this operation is performed while the device process is under automatic control, outputs may fluctuate, making device operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

- Double-click Reset Corrects. The “WARN - Loop should be removed from automatic control” message is displayed, warning that the loop should be switched from automatic control to manual mode. After switching to manual mode, click OK.
- The “About to Reset corrects” message is displayed to notify you that calibrated values will be reset. Click OK.
- After the calibrated values are reset, “Reset Corrects OK” is displayed. Click OK.
- The “Note - Loop may be returned to automatic control” message is displayed to notify you that you can now switch the loop back to automatic control. Click OK.

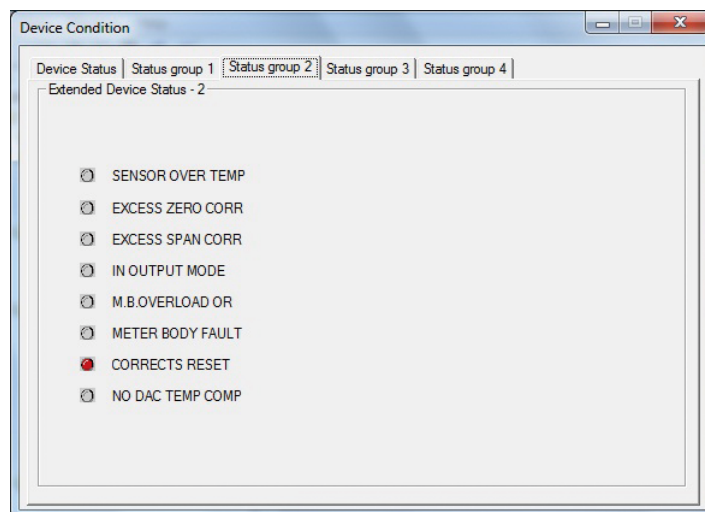
4-4. Checking Self-diagnostic Messages

You can check self-diagnostic messages by clicking the Status icon “A” in the below or “Device status” in the “Display” menu.



For example, the button to the left of CORRECTS RESET turns red after the calibrated values are reset.

For details on self-diagnostic messages, see the user's manual for the device.



Terms and Conditions

We would like to express our appreciation for your purchase and use of Azbil Corporation's products.

You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system products, field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1. Warranty period and warranty scope

1.1 Warranty period

Azbil Corporation's products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place. Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

- (1) Failure caused by your improper use of azbil product (noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
- (2) Failure caused for other reasons than Azbil Corporation's product;
- (3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors;
- (4) Failure caused by your use of Azbil Corporation's product in a manner not conforming to the intended usage of that product;
- (5) Failure that the state-of-the-art at the time of Azbil Corporation's shipment did not allow Azbil Corporation to predict; or
- (6) Failure that arose from any reason not attributable to Azbil Corporation, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.

2. Ascertainment of suitability

You are required to ascertain the suitability of Azbil Corporation's product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

- (1) Regulations and standards or laws that your Equipment is to comply with.
- (2) Examples of application described in any documents provided by Azbil Corporation are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
- (3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use
Although azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down. You are required to provide your Equipment with safety design such as fool-proof design,*1 and fail-safe design*2 (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance,*3 fault tolerance,*4 or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use.

*1. A design that is safe even if the user makes an error.
*2. A design that is safe even if the device fails.
*3. Avoidance of device failure by using highly reliable components, etc.
*4. The use of redundancy.

3. Precautions and restrictions on application

3.1 Restrictions on application

Please follow the table below for use in nuclear power or radiation-related equipment.

| | Nuclear power quality*5 required | Nuclear power quality*5 not required |
|---------------------------------------|--|--|
| Within a radiation controlled area*6 | Cannot be used (except for limit switches for nuclear power*7) | Cannot be used (except for limit switches for nuclear power*7) |
| Outside a radiation controlled area*6 | Cannot be used (except for limit switches for nuclear power*7) | Can be used |

*5. Nuclear power quality: compliance with JEAG 4121 required

*6. Radiation controlled area: an area governed by the requirements of article 3 of "Rules on the Prevention of Harm from Ionizing Radiation," article 2 2 4 of "Regulations on Installation and Operation of Nuclear Reactors for Practical Power Generation," article 4 of "Determining the Quantity, etc., of Radiation-Emitting Isotopes," etc.

*7. Limit switch for nuclear power: a limit switch designed, manufactured and sold according to IEEE 382 and JEAG 4121.

Any Azbil Corporation's products shall not be used for/with medical equipment.

The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product. However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives.

3.2 Precautions on application

you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use azbil product for any purposes specified in (1) through (6) below. Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility

to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.

- (1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
- (2) For use of specific purposes, such as:
 - * Nuclear energy/radiation related facilities
[When used outside a radiation controlled area and where nuclear power quality is not required]
[When the limit switch for nuclear power is used]
 - * Machinery or equipment for space/sea bottom
 - * Transportation equipment
[Railway, aircraft, vessels, vehicle equipment, etc.]
 - * Antidisaster/crime-prevention equipment
 - * Burning appliances
 - * Electrothermal equipment
 - * Amusement facilities
 - * Facilities/applications associated directly with billing
- (3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
- (4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
- (5) Machinery or equipment that may affect human lives, human bodies or properties
- (6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4. Precautions against long-term use

Use of Azbil Corporation's products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification. Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Azbil Corporation's products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5. Recommendation for renewal

Mechanical components, such as relays and switches, used for Azbil Corporation's products will reach the end of their life due to wear by repetitious open/close operations.

In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used. Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals. System products, field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts. For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6. Other precautions

Prior to your use of Azbil Corporation's products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Azbil Corporation's products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7. Changes to specifications

Please note that the descriptions contained in any documents provided by azbil are subject to change without notice for improvement or for any other reason. For inquiries or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8. Discontinuance of the supply of products/parts

Please note that the production of any Azbil Corporation's product may be discontinued without notice. After manufacturing is discontinued, we may not be able to provide replacement products even within the warranty period.

For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts. For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.

9. Scope of services

Prices of Azbil Corporation's products do not include any charges for services such as engineer dispatch service. Accordingly, a separate fee will be charged in any of the following cases:

- (1) Installation, adjustment, guidance, and attendance at a test run
- (2) Maintenance, inspection, adjustment, and repair
- (3) Technical guidance and technical education
- (4) Special test or special inspection of a product under the conditions specified by you

Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.

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CM2-CFS100-2005

Document Name:

Field Communication Software

Model: CFS100

Instruction Manual (Smart ALTJ3000 Immersion-type
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