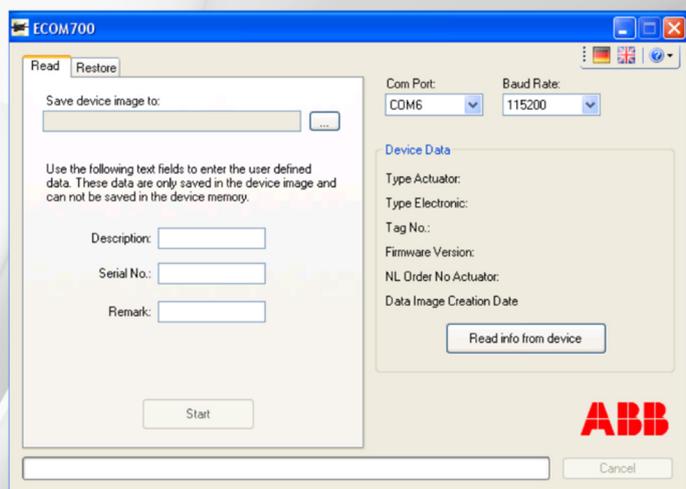# Software for Contrac control actuator
ECOM700

—
ECOM700

Introduction

Contrac & Engineering Tools to store and restore data for the ECOM700 electric actuators.
By using the ECOM700 Engineering Tool, the user can read out, save and write back respective actuator data from the electronic unit of a Contrac actuator.

Additional Information

Additional documentation on ECOM700 is available for download free of charge at www.abb.com/actuators.
Alternatively simply scan this code:

Table of contents

1 Safety

General information and instructions

These instructions are an important part of the product and must be retained for future reference.

Installation, commissioning, and maintenance of the product may only be performed by trained specialist personnel who have been authorized by the plant operator accordingly. The specialist personnel must have read and understood the manual and must comply with its instructions.

For additional information or if specific problems occur that are not discussed in these instructions, contact the manufacturer. The content of these instructions is neither part of nor an amendment to any previous or existing agreement, promise or legal relationship.

Modifications and repairs to the product may only be performed if expressly permitted by these instructions.

Information and symbols on the product must be observed. These may not be removed and must be fully legible at all times. The operating company must strictly observe the applicable national regulations relating to the installation, function testing, repair and maintenance of electrical products.

Warnings

The warnings in these instructions are structured as follows:

⚠ DANGER

The signal word '**DANGER**' indicates an imminent danger. Failure to observe this information will result in death or severe injury.

⚠ WARNING

The signal word '**WARNING**' indicates an imminent danger. Failure to observe this information may result in death or severe injury.

⚠ CAUTION

The signal word '**CAUTION**' indicates an imminent danger. Failure to observe this information may result in minor or moderate injury.

NOTICE

The signal word '*NOTICE*' indicates possible material damage.

Note
'**Note**' indicates useful or important information about the product.

Warranty provisions

Using the device in a manner that does not fall within the scope of its intended use, disregarding this manual, using underqualified personnel, or making unauthorized alterations releases the manufacturer from liability for any resulting damage. This renders the manufacturer's warranty null and void.

Manufacturer's address

ABB Automation Products GmbH
Measurement & Analytics
Schillerstr. 72
32425 Minden
Germany
Tel: +49 571 830-0
Fax: +49 571 830-1806

Customer service center
Tel: +49 180 5 222 580
Email: automation.service@de.abb.com

2 Introduction

General

Using the engineering tool ECOM700, the user can read out, store and write back actuator-related data from the electronic unit of a Contrac control actuator.

Note
Modification of the data content or configuration of the data is not possible.

The data that is written back also contains the end positions previously stored on the associated actuator. This end position information is also stored in the position sensor of the actuator. Therefore, readjustment is not necessary if the electronic unit is connected to exactly the same actuator which was also connected to the electronic unit when the data was read out. Thus, the number of electronic unit versions to be kept in stock for service tasks is significantly reduced because only the different performance variables must be taken into account.

Note
Data cannot be read out from or saved to explosion-proof actuators.

Note
The operating system of the Contrac electronic unit does not support updates / downdates.

Recommendation

To make sure that a database is available for the corresponding TAG number, we recommend creating a database once you have installed the actuator and electronic units in the system.
For this, we recommend proceeding as follows:
1. Install the actuator and electronic unit.
2. Commissioning the devices (including setting end positions on the actuator).
3. Perform all required configurations via the graphical user interface.
4. Once you have completed the above steps, create a backup file using the ECOM700. We recommend that you use the TAG number of the positioner as the file name.

ECOM700 / ECOM688

The software version is noted on the name plate of the electronic unit.

Für / For	
Antrieb / Actuator Typ / Type RHD2500-25	
Nennwerte / Rated values	
M = 2500 Nm ω = 3,5 °/s t = -10 °C ... +65 °C	
F-Nr. / No.: 68xxxUxxxxxx	
NL 68-250527 / 10:03	⚠ → 📖
SW-Version: 2.00	**ECOM700 required**
Kundenspez. Text	

① Associated actuator
② Nominal values for actuator torque / speed / permissible ambient temperature on the actuator
③ Serial number of the electronic unit
④ NL number (for non-list version)
⑤ Software version loaded
⑥ Free for customer-specific information

Figure 1:   Software name plate on electronic unit cover

Note
Contrac electronic units with software version ≥ 2.00 require ECOM700.
Contrac electronic units with software version < 2.00 require ECOM688.

Data cannot be read or written with an incorrect ECOM version. ABB offers a service to convert existing ECOM688 data to ECOM700 data.

Please contact:
ABB Automation GmbH
- Service Instruments -
Schillerstraße 72
D-32425 Minden
Deutschland
Fax: +49 571 830-1744
Mail: parts-repair-minden@de.abb.com

Hardware and software combinations

> ⚠️ **WARNING**
>
> **General danger**
> There must be an assurance that the approved combinations
> of hardware and software versions are always used.

Depending on the delivery status of the hardware, only specific
software versions can be loaded. The hardware is identified by a
module number on the electronic unit cover.
On delivery, the software version is indicated by a sticker on the
commissioning and service field (ISF) or on the outside of the
cover. It can also be displayed via the graphical user interface in
the 'Device Ident number' info block.

3 System requirements

System requirements	
Computer	Pentium II or higher
Operating system	Windows®XP, Windows Vista™, Windows®7
Main memory	128 MB
Memory capacity (hard drive)	Min. 1.5 MB free for the program; an additional 270 kB (approx.) is required for each data set
CD drive	
Interfaces	RS232 (COM) / USB

4 Installation

Note
The software may only be installed on virus-free systems.
If you do not know whether the system is virus-free, you must
run a virus scan before the installation.

1. Run the installation using the 'ECOM700_Setup.exe' file.
2. During installation, select either the suggested target
   directory or a directory of your choice.
   Once installation is complete, a shortcut is placed on your
   desktop.
3. Double-click this icon to launch the application.
4. To uninstall the ECOM700 software tool, you may only use
   the suited function in the control panel.

The software can be installed and operated on the Windows XP,
Windows Vista or Windows 7 operating systems.
The electronic unit of the actuator and the PC / laptop are
connected via an RS232 interface and a null modem cable with a
9-pin SUB-D connector. In order to use the USB port on the PC,
an additional, commercially available USB to RS232 adapter is
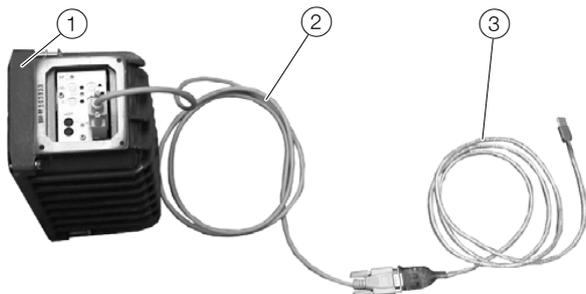required between the PC and null modem cable.

... 4 Installation

The USB to RS232 adapter is available from the manufacturer of the Contrac electronic unit on request.
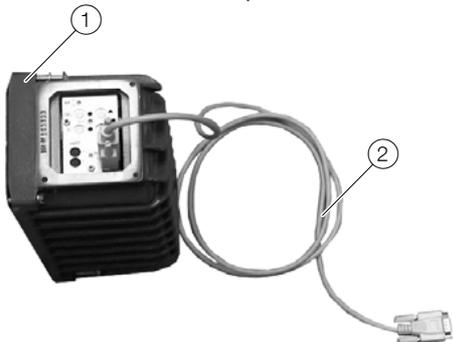
① Contrac electronic unit   ② Null modem cable

Figure 2:   Cable connection when using the RS232 interface on the PC

① Contrac electronic unit   ③ Additional USB to RS232
② Null modem cable   adapter

Figure 3:   Cable connection when using the USB interface on the PC

5 Electronic unit versions

Contrac electronic units are available as integrated units for actuator types PME120-AI and LME620-AI as well as for all actuators for field or rack installation.
The electronic units can control a wide variety of actuators depending on the loaded data set.

Integrated electronic units

EAS822   EBS852   EBS862

Figure 4:   Integrated electronic units

Electronic units for field installation

EAN823   EBN853   EBN861

Figure 5:   Electronic units for field installation

Electronic units for rack installation

EAS822   EBS852   EBS862

Figure 6:   Electronic units for rack installation

6 Actuator / electronic unit assignment

Note
Using the correct data set in the appropriate matching electronic unit is required for proper functioning.
The additional specification '(X)' before the respective actuator type indicates a possibly deviating version from the standard data sheet.

Note
Data cannot be read out from or saved to explosion-proof actuators.

Actuator types PME... / LME...

Electronic unit	Part-turn actuator	Linear actuator
EAI820, EAI823	(X)PME120-AI	(X)LME620-AI
EAN820, EAN823, EAS822	(X)PME120-AN	(X)LME620-AN

Actuator types RHB... / RSB...

Electronic unit	Part-turn actuator	Linear actuator
EBN851	(X)RHB250-10	(X)RSB10-1.3 / 100/300
EBN853	(X)RHB250-30	(X)RSB10-3.0 / 100/300
EBS852	(X)RHB500-10	(X)RSB10-5.0 / 100/300
	(X)RHB500-60	(X)RSB20-0.6 / 100/300
	X)RHB800-15	(X)RSB20-1.5 / 100/300
	(X)RHB800-35	(X)RSB20-2.5 / 100/300
	(X)RHB1250-12	(X)RSB20-4.0 / 100/300
	(X)RHB1250-35	(X)RSB50-1.5 / 120/300
	(X)RHB1250-60	(X)RSB100-0.8 / 150/300
	(X)RHB2500-25	(X)RSB100-1.5 / 150/300
	(X)RHB2500-45	(X)RSB200-0.7 / 180/300
	(X)RHB2500-70	
	(X)RHB4000-40	
	X)RHB4000-70	
	(X)RHB8000-80	
EBN861	X)RHB2500-10	(X)RSB50-10.0 / 120
EBS862	(X)RHB4000-10	(X)RSB50-10.0 / 300
	(X)RHB8000-15	(X)RSB100-10.0 / 150
	(X)RHB16000-30	(X)RSB100-10.0 / 300
		(X)RSB200-5.0 / 180
		(X)RSB200-5.0 / 300

Actuator types RHD... / RSD...

Electronic unit	Part-turn actuator	Linear actuator
EBN851	(X)RHD250-10	(X)RSD10-5.0 / 100/300
EBN853	(X)RHD500-10	(X)RSD10-10.0 / 100/300
EBS852	X)RHD800-10	(X)RSD20-5.0 / 100/300
	(X)RHD1250-12	(X)RSD20-7.5 / 100/300
	(X)RHD2500-25	(X)RSD50-3.0 / 120/300
	(X)RHD4000-40	(X)RSD100-1.5 / 150/300
	(X)RHD8000-80	(X)RSD200-0.7 / 180/300
EBN861	X)RHD2500-10	(X)RSD50-10.0 / 120/300
EBS862	(X)RHD4000-10	(X)RSD100-10.0 / 150/300
	(X)RHD8000-12	(X)RSD200-5.0 / 180/300
	(X)RHD8000-15	
	(X)RHD16000-30	

7 Establishing the connection

General

Data transfer of ECOM communication takes place via 'Logical HART®'. For this communication, the HART® protocol of the HART® FSK Communication is used. However, communication takes place via a direct wire connection with the device. Thus, communication is only ever possible with one device.

Note
To ensure reliable communication, the function of the FIFO buffer in the 'interface' settings within the 'control panel' as well as any 'power management' that may be present must be deactivated.
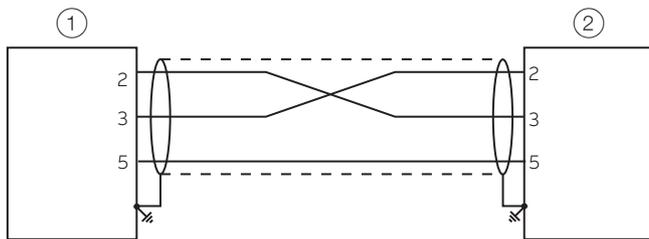
Note
The RS232 communication cable provides a conductive ground connection between the computer and the Contrac electronic unit. If the PC is grounded, a ground loop may form in the system.

Connection via COM port

Connection to the CONTRAC power electronic unit is made using a RS232 connection cable (ABB order number: 0746349).

The following figure shows the design of the connection cable.
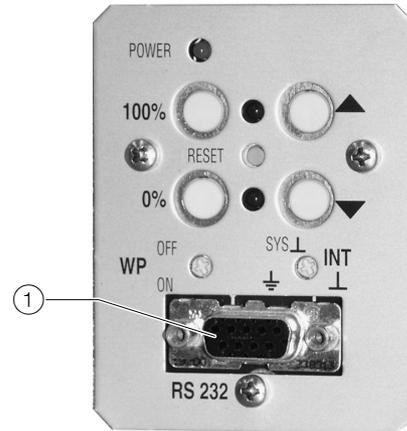
① 9-pin, SUB-D, male   ② 9-pin, SUB-D, female

Figure 7:   RS232 connection cable

Note
To connect the electronic unit to the computer, the RS232 connection cable from ABB must always be used.

The connection of the serial interface of the electronic unit is located on the commissioning and service field (ISF).

① Connection of the serial RS232 interface

Figure 8:   RS232 interface

Connection via USB interface

If the USB interface of the computer is to be used for the connection to the electronic unit, an additional commercially available USB adapter (USB → RS232) is required in addition to the RS232 connection cable (ABB order number: 0746349)
The adapter has both the USB plug for the connection to the computer as well as the 9-pin SUB-D plug for the connection to the RS232 connection cable from ABB.
After the installation of the associated driver and the connection of the USB plug, the operating system automatically sets up a virtual interface.

Note
If communication errors occur with the use of a USB adapter, the current driver from the manufacturer of the USB adapter must be installed.
The USB adapter must always be used together with the RS232 connection cable from ABB.

8 Operating with multiple programs

Note
Since the ECOM700 engineering tool in the electronic unit of the actuator reads and writes memory content, simultaneous operation with other programs, such as the graphical user interface, is not permitted.
Before the start, the other programs must be completely ended, since data conflicts will otherwise occur within the PC.

9 Electronic unit without actuator

To write data to replacement devices, it may be necessary to operate the electronic unit without the associated actuator. Supplying the electronic unit with power is sufficient to read and write data. An actuator does not have to be connected. The device monitoring in the Contrac electronic unit detects that the actuator is not connected and switches to 'error'. Communication remains possible.

If the electronic unit is then installed on an operational actuator, the error will be reset once the supply voltage has been powered-up. The message is only preserved in the error memory. It should then be reset, e.g. via the graphical user interface.

10 Operation

Start of the program

The ECOM700 engineering tool is started by double-clicking either the icon on the desktop or the file name 'ECOM700_Setup.exe' in the corresponding subdirectory.

Note
Dependent upon the processing power of your PC, it may take a few seconds to open the program.

Function call

Once the program is running, the functions can be called directly on the tabs by clicking on the buttons or making selections from pull-down menus.
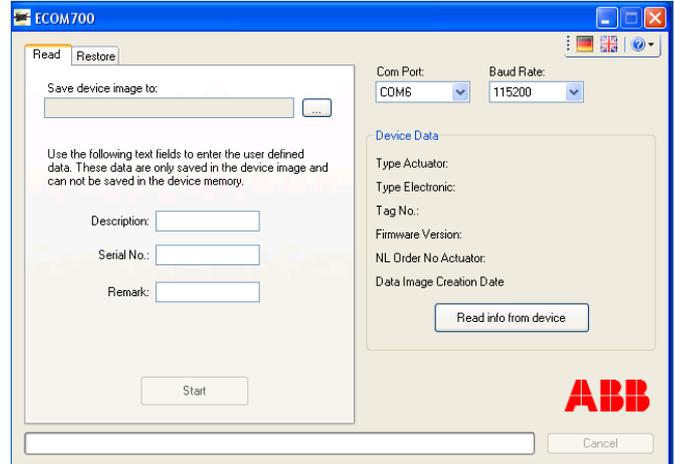

Figure 9:   ECOM 700 Program

Language selection
The dialog language of the ECOM700 engineering tool can be set to both English and German. A button is used to select the required language:

COM Port
Shows the available COM ports. Both the hardware interfaces and the virtual interface are shown if the connection is made via the USB port on the computer.

Baud Rate
Shows the selected baud rate (communication speed). The communication speed can be set via the pull-down menu. The Contrac electronic unit detects the selected baud rate and adjusts itself to it.

Note
The baud rate should be reduced if communication problems occur.

Help Menu
Contents
Opens the online help.
About ...
Displays information about the ECOM700 engineering tool.

… 10 Operation

Read out the data set

Call the function by selecting the 'Read out' tab.

Read info from the device

This function can be used to check communication with a connected electronic unit before reading out the data groups. If there are no communication errors, the following data detected from the connected electronic unit is displayed in the 'Device Ident number' field:

- **Actuator type**
  Shows the Contrac actuator type saved in the data set of the connected electronic unit.
- **Electronic unit type**
  Shows the type of Contrac electronic unit saved in the data set.
- **AKZ Positioner (TAG no.)**
  Shows the plant tag (AKZ) saved in the data set of the connected electronic unit.
- **Firmware Version**
  Shows the firmware version saved in the data set of the connected electronic unit.
- **Actuator NL Number**
  Shows the number of the non-list version of the actuator saved in the data set.
- **Data image creation date**
  Shows the date on which the data set loaded in the device was created with the ECOM700.

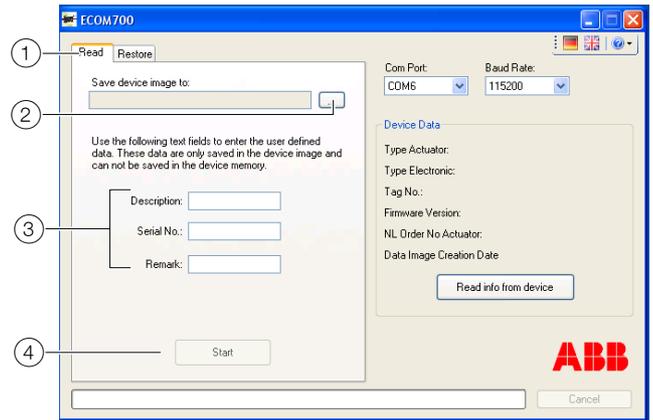These specifications can be used to check whether the computer is connected to the correct electronic unit.
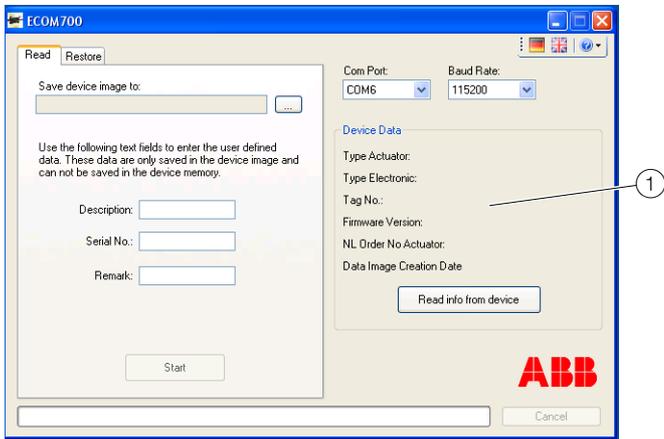
① Data of the connected electronic units

Figure 10:   ECOM700 Program

Read out

This function is used to read out data from the connected electronic unit.

①	'Read out' tab	③	Supplementary information
②	'Save data image to'	④	Start

Figure 11:   'Read out' menu command

1. Call the function by selecting the 'Read out' tab.
2. Before reading out the data, define a file in which the data is to be saved by clicking the 'Save data image to' button.
   The name of this file and the directory path are then shown in the 'Save archive to' field.
3. There are three edit boxes available for entering additional information to be saved with the read out data.
   Designation
   A plain text entry about the function of the actuator may be made here, for example feed water preheating.
   Line length: maximum 40 characters.
   Serial number
   Enter the electronic unit serial number here.
   Line length: maximum 14 characters.
   Remark
   You can enter a free text comment in this field.
   Line length: maximum 80 characters.
4. Click the 'Start' button to start the read operation.
   A corresponding message appears once the data has been read out successfully. The data is stored without any additional commands in the predefined file.
   The backup file size amounts to approximately 10 KB.

Note

The reading out of the data can be aborted at any time by clicking the 'Abort' button. The electronic unit then switches back to the original operating condition.

Writing back the data set

Call the function by selecting the 'Write back' tab.

Archive identification

The following information from the selected and saved data set is displayed in 'Archive identification':

- **Actuator type**
  Shows the Contrac actuator type saved in the data set of the connected electronic unit.
- **Electronic unit type**
  Shows the type of Contrac electronic unit saved in the data set.
- **AKZ Positioner (TAG no.)**
  Shows the plant tag (AKZ) saved in the data set of the connected electronic unit.
- **Firmware Version**
  Shows the firmware version saved in the data set of the connected electronic unit.
- **Actuator NL Number**
  Shows the number of the non-list version of the actuator saved in the data set.
- **Data image creation date**
  Shows the date on which the data set was created with the ECOM700.

The additional information entered when the data set was created is also displayed:

- **Features**
  A plain text entry about the function of the actuator, e.g., feed water preheating.
- **Serial number**
  Serial number of the electronic unit.
- **Remark**
  Free text.

Use these specifications to check whether the selected archive data set corresponds to the actuator type and the TAG number.
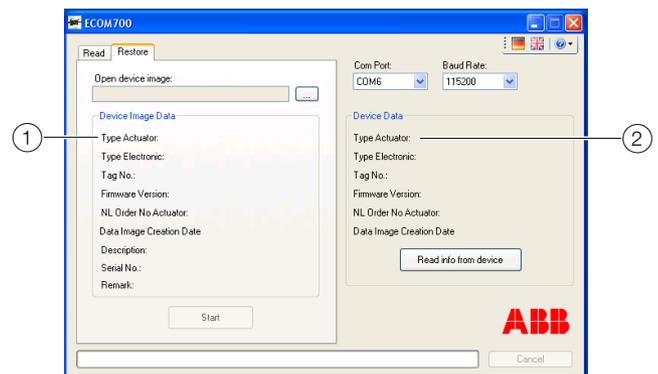
Device identification

This function can be used to check communication with the connected electronic unit. If there are no communication errors, the following data detected from the connected electronic unit is displayed in the 'Device identification' field:

- **Actuator type**
  Shows the Contrac actuator type saved in the data set of the connected electronic unit.
- **Electronic unit type**
  Shows the type of Contrac electronic unit saved in the data set.
- **AKZ Positioner (TAG no.)**
  Shows the plant tag (AKZ) saved in the data set of the connected electronic unit.
- **Firmware Version**
  Shows the firmware version saved in the data set of the connected electronic unit.
- **Actuator NL Number**
  Shows the number of the non-list version of the actuator saved in the data set.
- **Data image creation date**
  Shows the date on which the data set was created with the ECOM700.

The additional information entered when the data set was created is also displayed:

- **Features**
  A plain text entry about the function of the actuator, e.g., feed water preheating.
- **Serial number**
  Serial number of the electronic unit.
- **Remark**
  Free text.

Use these specifications to check whether the selected archive data set corresponds to the connected electronic unit.

① Information about the stored   ② Data of the connected
   data set   electronic unit

Figure 12: Device identification display

... 10 Operation

... Writing back the data set

Write back archive
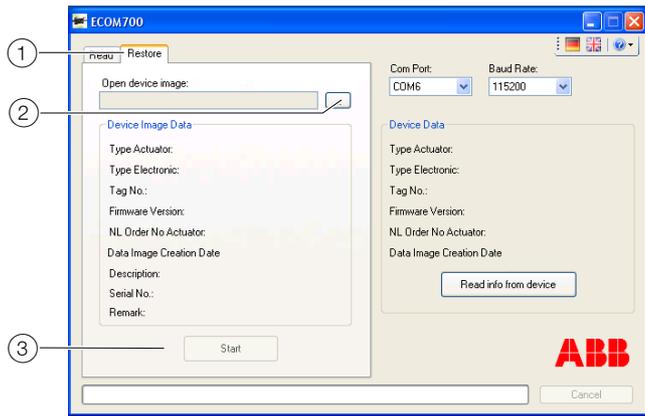This function is used to write the archive data to a connected electronic unit.

Figure 13:   'Write back' menu command

1. Call the function by selecting the 'Write back' tab.
2. Then click the 'Open data image from' button to load the file from the data storage medium to the interface of the ECOM700 engineering tool.
    The information saved about the actuator and the electronic unit (data image identification) is displayed.
3. Click the 'Start' button to start the write operation. A corresponding message window appears once the write operation has been completed successfully.

Note
Since a complete ECOM file must always be transferred to the electronic unit when data is written back, the 'Abort' button does not work.

Data transfer mode

Switchover to data transfer mode (bootstrap mode) occurs automatically when you select the 'Create archive' or 'Write back archive' commands. Indication of data transfer mode see **LEDs** on page 13.

Note
As long as the electronic unit is in 'bootstrap' mode, it is not available and the 'Not ready for operation' message is transmitted to the control system. Communication is interrupted with PROFIBUS® devices.

Note
If a data set could not be written back successfully, the electronic unit remains in data transfer mode. The electronic unit does not switch back to operating mode until the write-back operation has been completed successfully.

Note
The electronic unit must not be commissioned until all the data has been written back successfully. A corresponding error message appears if data transfer was interrupted during the write-back operation. The cable connection should be checked and if necessary the baud rate reduced before attempting the write operation again.

Program information
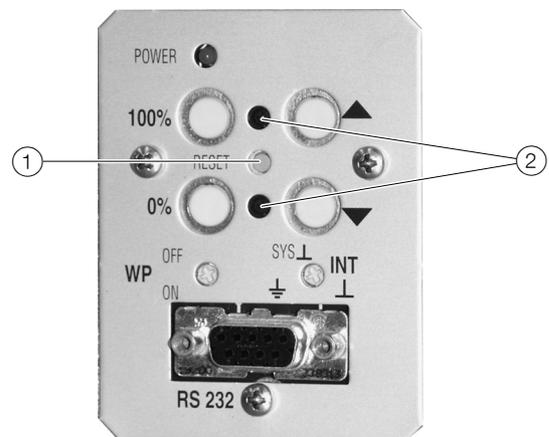
① Reset button   ② LED for state signaling

Figure 14:   Commissioning and service field (ISF)

LEDs

Both red LEDs on the commissioning and service field (ISF) provide information about the operating condition of the CONTRAC electronic unit.

Signal state	Cause / Remedy
Both LEDs are switched off.	Normal operation or no voltage.
LED 2 is on, LED 3 is off.	Standard operation: MAN via digital input or graphical user interface.
LED 2 is off, LED 3 flashes at 1 Hz.	Standard operation: MAN via ISF.
Both LEDs flash in sync at approximately 4 Hz.	The electronic unit is switched to 'Adjustment' mode. The actuator must be adapted to the working range of the valve.
Both LEDs flash alternately at approximately 4 Hz.	The CONTRAC electronic unit has an 'error'. • A detailed error message appears on the graphical user interface under 'Call up status' and 'Remedy error'. • Then 'reset' by pressing the reset button on the 'ISF' or switching the power supply off and on again.
Both LEDs light up continuously.	The electronic unit is in 'Bootstrap mode'. 1. Switch to 'Operating' mode by pressing the reset button on the 'ISF'. 2. Power interruption or transfer error during data writing in the CONTRAC electronic unit. Thus, no valid data set available. 3. Press the reset button on the 'ISF' and write the entire data set into the CONTRAC electronic unit again. • If no change occurs after step 1 or step 2, there is a hardware error. The electronic unit must be replaced completely (cover and lower section).

11 Error messages

The following messages can occur dependent upon the operating mode:

Fault message	Possible cause	Troubleshooting the Instrument
The archive cannot be written to the connected device as the actuator class in the archive does not match the actuator class of the connected device.	The power class of the electronic unit saved in the data set does not match the power class of the connected electronic unit.	Connect an electronic unit with the appropriate power class.
The actuator type in the archive does not match the actuator type of the connected device. Do you wish to continue?	The actuator type saved in the data set does not match the actuator type in the connected electronic unit.	Check whether the data set to be written back matches the connected device.
The connection to the device could not be established.	The connection to the connected electronic unit could not be established.	Check the COM port setting and reduce the communication speed if necessary.
The archive cannot be written to the connected device because the device is write-protected. Please remove write protection and try again.	The write protection switch on the commissioning and service field (ISF) is switched on.	Set the write-protection switch on the ISF to OFF.
You are not permitted to write EX device archives.	An attempt is being made to write a data set for an explosion-proof device.	This function is not permitted
This program version is out of date. In order to be able to operate the device, please download the latest version of ECOM700 from http://www.abb.com.	The ECOM program version is not compatible with the software in the connected device.	An update file is available on the Internet at http://www.abb.com. Please follow the instructions in the Download area.
The selected COM port is invalid.	The selected COM port is not ready for operation. Another program might be using the port.	Select a different COM port.
The selected file is not a valid ECOM700 archive.	The selected file is not an ECOM700 archive file or the file is damaged.	Select a suitable ECOM archive file.
Creation of data set has failed. Ensure that communication is possible and try again.	A communication error occurred while reading out the data.	Check the connection and reduce the baud rate if necessary.
You are not permitted to write archives to EX devices.	An attempt is being made to write a data set to an electronic unit for an explosion proof actuator.	This function is not permitted.

12 Adjusting the actuator after replacing the electronic unit

General

The data set in the electronic unit is set at delivery so that the actuator must be adapted (adjusted) to the valve operating range. If the data is read out of the operationally ready actuator after the adjustment, the settings calculated during the commissioning are also stored.

If an electronic unit is loaded with this 'complete' data set, adapting of the actuator to the operating range of the valve is not mandatory after replacement of the electronic unit.

Requirements

The newly loaded electronic unit must work together with the same actuator in the same mechanical design as at the point in time when the data was read out.

NOTICE

Damage to components!
If an actuator is not matched to the operating range of the valve, the valve, actuator or electronic unit can sustain damage.
No changes must have been made to the actuator or to the valve in between times.

If the actuator is operated without new adjustment, an additional position error of approx. 1 to 2 % can occur due to hardware tolerances in the electronic unit. In control mode, the additional deviation is compensated for by the superimposed controller. For operation in the end positions, however, a precise function check is required, and possibly readjustment.

Trademarks

Windows is a registered trademark of Microsoft Corporation.

PROFIBUS and PROFIBUS DP are registered trademarks of PROFIBUS & PROFINET International (PI)

HART is a registered trademark of FieldComm Group, Austin, Texas, USA

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