Installation, Operation and Maintenance Manual
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Biffi ICON3000

Advanced Maintenance Instructions

BIFFI

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Section 1: Introduction

This manual should be used in conjunction with the Installation, Operation and Maintenance Manual (IOM) of the ICON3000.

This manual supplies an additional set of instructions for service and troubleshooting and describes the parameters available in the RESTRICTED MENU.

The routines contained within the RESTRICTED menu can significantly modify the functionality of the actuator; therefore, access to and utilization of the RESTRICTED menu should be limited to only trained and authorized technicians.

If any parameter in the RESTRICTED menu is changed, power must be cycled on the actuator for the changes to take effect.

Section 2: Reserved Passwords

The VIEW and SETUP features available through the Local Operator Interface allows the user to set actuator characteristics according to the needs of the process and to view diagnostic messages and status.

To enter the SETUP menu a password is required. Three levels of password are available:

1. **Password level 0:** This is the "user" password and consists of 4 alphanumeric characters. The actuator is supplied with the password "0000" (four zeros) from the factory. The user can change this factory password as described in the ICON3000 IOM.
2. **Password level 1:** This password allows the user all of the functionality afforded by Level 0, but also allows the NAMEPLATE routine to be entered and changed. Nameplate data is normally entered in the factory. The Level 1 password (not "0000") is entered in the same fashion as Level 0.
3. **Password level 2:** This password offers all the functionality of Levels 0 and 1, and also offers entry into the RESTRICTED routine of the ACTUATOR SETUP menu. Special routines can be found within the RESTRICTED routine that are generally used to enable and disable hardware and software modules, and calibrate the ICON3000's sensors. There is a special procedure for entering the Level 2 password, which is as follows:

- Enter VIEW and SETUP menu as described in the IOM of the actuator.
- Select language.
- Select SETUP mode.
- Enter password:
  - Select the 1st character of password, and then press YES.
  - Select the 2nd character of password, and then press YES.
  - Select the 3rd character of password, and then press YES.
  - Select the 4th character of password, and then press YES and keep this push-button pressed down until the display shows the message "PASSWORD CORRECT." The button must be kept pushed down for approximately 10 seconds for the password to be accepted.
- Confirm SETUP mode.
- Confirm ACTUATOR SETUP.
- Scroll the ACTUATOR SETUP routines until the display shows the message “RESTRICTED.” Press YES to enter.
- View or change the restricted parameter(s), and then EXIT from the menu.

Upon having changed any parameter in the RESTRICTED menu, actuator power must be cycled in order for the changes to take effect.

Contact Emerson Lifecycle Services to request access to the Level 1 and Level 2 passwords.

The list below shows the available routines in the ACTUATOR SETUP menu:

- Stroke limits
- Torque set up
- PST set up*
- ESD set up*
- EFS/PST*
- Remote controls
- Local controls
- Output relays
- Positioner*
- Fail Safe*
- Out 4 - 20 mA*
- Interlock*
- 2 speed timer
- Bus*
- Miscellaneous
- Restricted
- Reserved

The routines with marked with an asterisk (*) are present only if the relevant electronic cards are present. Should the bus interface be LonWorks, then the BUS routine will display as "FDI CONTROL." The RESTRICTED menu routine will only appear if the Level 2 password is entered.

Section 3: Restricted Menu Routines

Within the RESTRICTED menu, certain routines are grouped into RESTRICTED and RESERVED categories. To access the RESERVED routines, scroll through each of the RESTRICTED routines and when the menu displays EXIT OK, press the NO push-button. Each routine is listed as follows:

Restricted Routines

- Torque stop zone
- Speed bypass
- Voltage span
- 1 P.man
- HW config.
- Positioner
- Request
- Fail Safe
- Bus An-out
- Direction test
- Card Ain/Aout
- BLT ext. antenna or Bluetooth
- IrDA
- Bus protocol
- PID

Reserved Routines

- SW type
- Term. board
- Additional var.
- Reversal delay
- Backlight
- 4 - 20 mA config.
- Current sensor
- Torque sensor
- Speed band
- Base temp. ref.
- LCD temp. ref.
- Term. temp. ref.
- Torque function
- Interlock mode
- Sleep mode
- MR in sleep
- New FW
- Serial cmd
- Loc/Rem
- Bluetooth code
- EFS duty
- Spring action
- EFS. EL. CMD
- ESD input mode
- CMd filter
- ESD-INT filter

3.1 Torque Stop Zone

If the torque limit is reached in the position interval “0 to torque stop zone” and “100-torque stop zone to 100” and opening or closing stroke limits are set by torque, then the ICON3000 considers the reached position as “end of travel.” If the torque limit is reached at a position between “torque stop zone” and “100-torque stop zone," then the ICON3000 will generate an alarm. If the torque limit is not reached the warning “wrong stroke limit“ is generated. Standard value = 5%.

3.2 Speed Bypass

This is the time needed to update the motor speed after receipt of an open or close command. Standard value = normally >1.5 seconds (depends on actuator type).

3.3 Voltage Span

This function allows to recalibrate the sensor that measures the main voltage supply.
The recalibration procedure is as follows:

Using a multimeter, measure the value of the voltage supply on terminals L1/L2 of the terminal board. On the actuator display, enter the same value measured by the multimeter and then press YES. The new value is accepted only if it is at least 1 V different from the previous value. Pressing YES will not effect any change in voltage sensor calibration if the value indicated on the display is not changed.

3.4 1 P.man

This function is also known as "Gear Relaxation," and functions by backing off the motor a small amount at either end of the valve travel. The effect is to reduce compressive stress on the actuator gears and facilitate engagement of the manual override declutch lever. This routine is set in-house. Standard value = DISABLED.

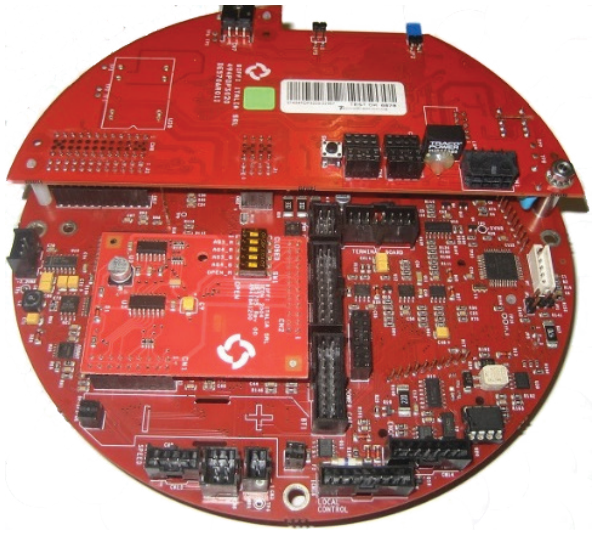
3.5 HW Config

This function is used to select the fieldbus control option. The following options can be selected:

- Base (No bus control)
- Lon (Lonworks)
- Mod-bus (Modbus RTU)
- Prof-V0 (Profibus DPV0)
- Mod-m (Modbus RTU)
- FF (Foundation Fieldbus)
- Hart (Hart)
- Prof-V1 (Profibus DPV1)
- Prof-V1r (Profibus DPV1 redundant)
- MOD-Dw (Modbus Dewa)
- Prof-V2 (Profibus DPV2)
- Prof-V2r (Profibus DPV2 redundant)

If the “base” option is set, then a fieldbus interface card is not required. If one of other options is chosen, the ICON3000 base card must be equipped with the appropriate bus interface card. It is also necessary to set the parameter “bus protocol” that sets the type of communication protocol between the base card and the bus interface card. The “BUS” routine appears in the ACTUATOR SETUP menu and the relevant parameters (node address, baud rate, etc.) can be viewed and changed as described in the ICON3000 IOM. If the option LONWORKS is chosen, the “BUS” routine in the ACTUATOR SETUP menu changes to "FDI CONTROL."

Figure 1 Base Card of ICON3000 Equipped with a Bus Card



3.6 Positioner

This routine allows the user to enable or disable the positioner function. If the option ENABLED is set, the POSITIONER routine appears in the ACTUATOR SETUP menu and the relevant parameters (dead band, motion inhibit time, etc.) can be viewed and changed as described in the ICON3000 IOM. The type of position request signal (from 4 - 20 mA input or from bus) is set by the routine REQUEST.

3.7 Request

This routine allows the user to select the type of position request signal used in the POSITIONER routine. The options available are 4 - 20 mA and BUS. Set BUS. if the positioner will receive the position request from bus interface and set “4 - 20 mA” if the position request signal will be received from the optional analog 4 - 20 mA input/output module (named "Ain/Aout"). The parameter "CARD Ain/Aout" must be set to PRESENT.

3.8 Fail Safe

This routine allows the user to enable or disable the fail safe action performed by the actuator in cases of remote control failure via bus or via 4 - 20 mA analog input. If the option ENABLED is chosen, the routine FAIL SAFE appears in the ACTUATOR SETUP menu and the relevant parameters (action and delay) can be viewed and changed as described in the ICON3000 IOM.

3.9 Bus An-Out

This parameter is set in-house. The standard value is “TORQUE.”

3.10 Direction Test

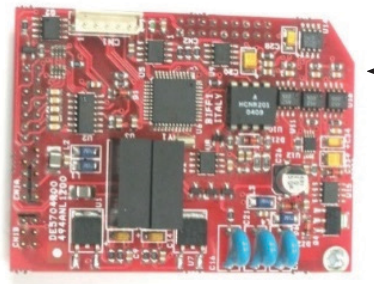
This parameter is used in the ICON3000 in the direction test. If the test fails a SPEED SENSOR alarm is generated. The standard value for ICON3000 is 1.

3.11 Card Ain/Aout

This parameter has two options: PRESENT or ABSENT. Set PRESENT if the base card is equipped with the optional 4 - 20 mA input/output card ("Ain/Aout") that provides an analog 4 - 20 mA input and output to the actuator. The routine OUT 4 - 20 mA appears in the ACTUATOR SETUP menu and the relevant parameters (e.g. polarity) can be viewed and changed as described in the ICON3000 IOM. A report message can also be viewed as described in the same IOM.

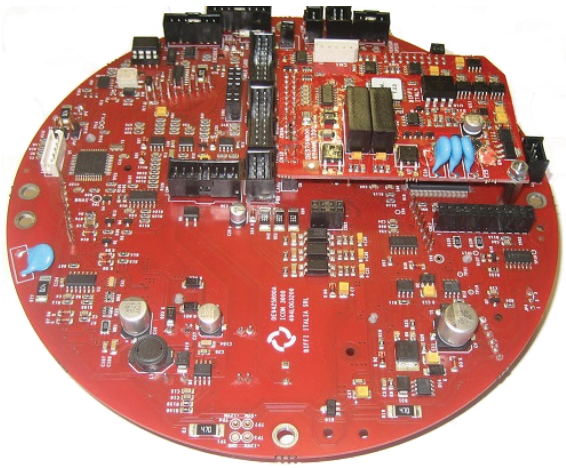
Set the parameter to ABSENT if the terminal board adaptor card (see Section 6.1) has been installed instead of the 4 - 20 mA "Ain/Aout" card. Setting this parameter incorrectly can result in a hardware alarm (refer to the ICON3000 IOM for details on this alarm).

Figure 2 Ain/Aout Card



This optional card is used in place of the Terminal Board Adaptor card when an analog 4 – 20 mA input and output signal is requested.

Figure 3 ICON3000 Base Card Equipped with Ain/Aout Card



3.12 Bluetooth Extension Antenna or Bluetooth

This parameter has two options: ENABLED or DISABLED.
If the BLUETOOTH parameter is enabled, the RS232 service line on the base card will not be available. The BLUETOOTH parameter needs to be set to DISABLED before using the RS232 service line. Therefore, it is recommended to set BLUETOOTH to DISABLED.

3.13 IRDA

This function is not implemented. It is normally set to DISABLED.

3.14 Bus Protocol

This parameter allows the user to select the communication protocol between the base card and fieldbus interface card. I20 and I24 are the two available options. Refer to the relevant ICON3000 bus protocol manual to correctly set this parameter.

3.15 PID

This function is not implemented. It is normally set to DISABLED.

3.16 Reserved Routines

3.16.1 SW Type

This routine must be set to "ICON."

3.16.2 Term Board

This routine must be set to “I24_V4.”

3.16.3 Additional Var.

The standard value is “MASK” and the following data can be viewed:

- Output torque
- Motor speed
- Main voltage
- Current
- Temperature
- Time
- Date
- Alarm
- Warning
- Ktemp
- Mot temp
- Term temp
- Log status
- Wireless report
- Node report*
- FDI report*
- Base report
- Term report
- Ain/Aout report*
- EFS report*

The data with * are present only if the relevant modules are present.

With the option VIEW, additional data useful for maintenance can be viewed:

- Battery Value: value in volt of the battery
- Remote Command: status of the DIs => bit0: not used, bit1: ESD, bit2: Open, bit3: Close, bit4: Stop, bit5: Man, bit6: Int_CL, bit7: Int_OP
- Encoder Abs Position: 0 to 2196479
- Encoder Status: bit0 = CCW, bit7 = calibrated, bit8 = communication error, bit9 = CW/CCW wrong communication
- Encoder wheel 1: 0 to 2047
- Encoder wheel 2: 0 to 2047
- Encoder wheel 3: 0 to 2047
- Encoder limit 0%
- Encoder limit 100%
- Encoder Error: error counter (communication between Base card and Encoder)
- Counter: position %
- Pic Word 1: Status => (bit0: wake up H8, bit2: encoder OK, bit10: Position OK, bit11: Low bat, bit12: 24 V_ext_present, bit13: 13 V dc present, bit 14: CRC PIC OK, bit15: calibration in progress)
- Pic Word 2: Push-buttons/Selector => bit0: remote, bit1: Local, bit2: stop, bit3: close, bit4: open, bit5: not configured as ICON
- Pic Word 3: encoder status => bit0 = CCW, bit7 = calibrated, bit8 = communication error, bit9 = CW/CCW wrong communication
- Pic Word 4: encoder error counter (communication between Base card and Encoder)
- Pic Word 5: reserved
- Pic Word 6: reserved
- Pic Word 7: reserved
- Pic Word 8: reserved
- Pic Word 9: reserved
- Pic Word 10: reserved
- Pic Word 11: reserved
- Pic Word 12: reserved
- Pic Word 13: reserved
- Pic Word 14: reserved
- Pic Word 15: configuration => bit0: battery present, bit1: CCW
- Pic Word 16: reserved
- Pic Port A: status of the pic port A
- Pic Port B: status of the pic port B
- Pic Port C: status of the pic port C
- Pic Port D: status of the pic port D
- Pic Port E: status of the pic port E
- Pic AN0: PIC analog input (battery value in bit)

- Port 4 an0: not used
- Port 4 an1: not used
- Port 4 an2: not used
- Port 4 an3: main voltage in bits
- Port 4 an4: motor current in bits
- Port 4 an5: terminal board type in bits
- Port 4 an6: auxiliary contact of K1 contactor in bits
- Port 4 an7: current range out in bits
- Port 9 an0: auxiliary contact of K2 contactor in bits
- Port 9 an1: status of Bluetooth module in bits
- Port 9 an2: reserved. Not used for ICON3000
- Port 9 an3: motor thermostat in bits
- Port 9 an4: motor temperature in bits
- Port 9 an5: not used
- Port 9 an6: heater cmd in bits
- Port 9 an7: backlight cmd in bits

3.16.4 Reversal Delay

This function sets the delay implemented as part of the instantaneous reversal feature (i.e. reverse motor rotation). Standard value is 1.1 seconds.

3.16.5 Backlight

The standard value is AUTO. The backlight of display automatically switches off 2 minutes after the last operation with the local operator interface. This option increases the life of the display since the backlight is powered only when using the local operator interface.

With the option “ON,” the backlight of the display is always powered. Use this option only when absolutely necessary.

3.16.6 4 - 20 mA Config

This routine is used to calibrate the 4 - 20 mA input and outputs. This is normally done in-house. Should it be necessary to recalibrate the 4 - 20 mA input and output, this needs to be conducted in two steps.

Reconfigure the limits of the A/D and D/A converters of the base card as follows:

- Enter VIEW and SETUP menu as described in the ICON3000 IOM.
- Select the language.
- Select SETUP mode.
- Enter the Level 2 password.
- Select ACTUATOR SETUP.
- Scroll the list of routines and press YES when the message displayed is “RESTRICTED.”
- Press YES to scroll the list of “RESTRICTED” routines and press NO when the message displayed is “EXIT OK?”.
- Press YES until the message displayed is “4 - 20 mA CONFIG. CHANGE?”
- Press YES to enter the “4 - 20 mA CONFIG.” routine. The message displayed will be “READ OK?”.
- Press YES to view or change the configured values corresponding to I = 4 mA (from 0 to 2000), I = 20 mA (from 2000 to 4095), O = 4 mA (from 0 to 2000), O = 20 mA (from 2000 to 4095). Press YES to confirm and skip to next step or press NO to change. Values out of range cause a CONFIGURATION alarm.
- Or press NO to skip to “SETUP OK?”.
- When the message displayed is “SETUP OK?” press NO to exit or press YES to recalibrate:
  - Connect a 4 - 20 mA current generator to terminals B8/B9 and a multimeter in mA to terminals C10/B7 in accordance with the electrical diagrams.
  - The message displayed is “I = 4 mA=xxxx.”
  - Set the current generator to 4 mA. The displayed value should be from 0 to 2000. Press YES.
  - Set the current generator to 20 mA. The displayed value should be from 2000 to 4095. Press YES.
  - Press NO until the multimeter indicates 4 mA. The displayed value should be from 0 to 2000. Press YES.
  - Press NO until the multimeter indicates 20 mA. The displayed value should be from 0 to 2000. Press YES.
  - Exit from the configuration menu.

3.16.7 Current Sensor

This routine includes the calibration values of the current sensor. Calibration of the current sensor is done in-house. Enter the routine only if a new setting is required. There are two options available: READ and SETUP. In READ mode the operator can view and change the values corresponding to currents 2 A, 3.5 A, 7 A, 15 A, and 30 A via the local operator interface. Do not enter SETUP mode. When the message displayed is “CURRENT SENSOR CHANGE?” press NO to skip to next routine or press YES to enter. The display will show the message “READ OK?” Press YES to view or change the values. If the NO push-button is pressed the message displayed will be “SETUP OK?” Press NO to exit.

3.16.8 Torque Sensor

This routine is used in-house to set torque sensor parameters. Do not enter into this routine; if this occurs, press NO when the message TORQUE SENSOR CHANGE? is displayed.

3.16.9 Speed Band

The standard value is 10. The value is automatically adjusted as a function of the number of motor poles stated in the motor data section of the NAMEPLATE menu.

3.16.10 Base Temp. Ref.

The standard value is 2 °C. When the temperature inside the electronics compartment is less than the above value, the heater of the base card is powered.

3.16.11 LCD Temp. Ref.

The standard value is -5 °C. When the temperature inside the terminal board compartment is less than the above value, the heater of the LCD display is powered.

3.16.12 TERM Temp. Ref.

The standard value is 0 °C. When the temperature inside the terminal board compartment is less than the above value, the heater on the terminal board cards is switched on.

3.16.13 Torque Function

This parameter is normally set to “STANDARD.”

3.16.14 Interlock Mode

This parameter is normally set to “STANDARD” and INTERLOCK function is available. If the INTERLOCK MODE is set in “ADVANCED” the ICON300 use the Interlock input as PST commands. INTERLOCK OPEN becomes command to carry out PST in open direction. INTERLOCK CLOSE becomes command to carry out PST (Partial Stroke Test) in close direction. PST function are performed only if the actuator is fully open or closed.

3.16.15 Sleep

This parameter is normally set to “DISABLED.” Use the option to enable SLEEP function. Refer to the ICON3000 Sleep Mode manual for a detailed description of this function.

3.16.16 MR in Sleep

This parameter is normally set to “OFF.” Use this option to set MR to OFF or ON when the SLEEP function is enabled. Refer to the ICON3000 Sleep Mode manual for a detailed description of this function.

3.16.17 New FW

This parameter is normally set to “DISABLED.” Use the option ENABLED only if the base card firmware must be updated. Set the back to DISABLED after upgrading the firmware. Refer to the appropriate instructions relevant to firmware upgrades.

3.16.18 Serial CMD

This parameter is normally set to “DISABLED.” Use this option to enable OP/CL/STOP command from Bluetooth, RS232 interface.

3.16.19 Loc/Rem

This parameter is normally set to “DISABLED.” Use this option to enable local OP/CL/STOP commands also when the local selector is in REMOTE (LOC+REM).

3.16.20 Bluetooth Code

This parameter is normally set to “S/N.” Use this option to select Bluetooth code between “S/N” = actuator serial number and “V/TAG” = valve tag.

3.16.21 EFS Duty

Reserved. Not used by ICON3000.

3.16.22 Spring Action

Reserved. Not used by ICON3000.

3.16.23 EFS EL.CMD

Reserved. Not used by ICON3000.

3.16.24 ESD Input Mode

Reserved. Not used by ICON3000.

3.16.25 CMD-filter

This parameter is normally set to 1. The maximum value is 32. Use this option to set the filter level of OP/CL/ST commands.

Set the above parameter to 100 if a fast reaction is required in response to open and close commands.

The setting causes the following changes:

- Control mode in local and remote changes to “push to run.”
- Filtering reduced to the minimum.

3.16.26 ESD/INT-filter

This parameter is normally set to 1. The maximum value is 32. Use this option to set the filter level of ESD/INT commands.

Section 4: Alarm "Configuration n°"

If the checksum of the EEPROM memory containing the data of ICON3000 settings is wrong, exit the alarm “CONFIGURATION n°” (refer to the ICON3000 IOM).

Every configuration parameter is called “OBJECT or OBJ” and is characterized by an “OBJ number.” The number “n°” indicates the number of the OBJ that is out of range.

To clear the configuration alarm, it is necessary to set the correct value using the VIEW and SETUP features as described in the ICON3000 IOM.

If the alarm message is “CONFIGURATION OBJ 9999,” only one of the actuator parameters needs to be changed. For example: enter the SETUP menu, then ACTUATOR SETUP, then TORQUE SETUP, then and increase or decrease the closing torque by 1%. When the alarm message disappears, reenter the SETUP menu, then ACTUATOR SETUP, then TORQUE SETUP, and then set the previous value.

If the alarm message is “CONFIGURATION OBJ 720 or 721 or 722 or 723,” proceed as follows:

- Repower the actuator and observe the first message of the display. If the ICON3000 base card is equipped with the “Ain/Aout” optional card, check the following parameters in the “RESTRICTED” menu routines:
  - Term board: should be set to “I24 V4”
  - Card Ain/Aout: should be set to “PRESENT”

  If the settings are wrong, enter the correct values and then proceed to cycle power on the actuator.

In the following table is the list of the Objects (or parameters). The OBJECTS are sorted according to the actuator menu. Every line of the table gives a complete description of the Object by means of “OBJ n°,” “normal value,” "function," and “description and ranges.”

4.1 Object List of ICON3000

Table 1. Stroke Limits and Torque Setup

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
102	CW	Close direction	CW, CCW
100	Off	Close limit type	Torque, position
101	Off	Open limit type	Torque, position
506	70	Closing torque	From 40 to 100%
505	75	Opening torque	From 40 to 100%
510	60	Breakout in closing	From 40 to 100%
511	40	Peak run in closing	From 40 to 100%
512	80	Ending in closing	From 40 to 100%
513	90	Breakout zone in closing	From 0 to 100%
514	10	Ending zone in closing	From 0 to 100%
515	90	Breakout in opening	From 40 to 100%
516	40	Peak run in opening	From 40 to 100%
517	80	Ending in opening	From 40 to 100%
518	20	Breakout zone in opening	From 0 to 100%
519	80	Ending zone in opening	From 0 to 100%

Table 2. ESD Setup

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
600	Off	ESD action	Off, close, open, stay put, go to position %
601	50	ESD position	From 0 to 100
605	ESD<thermostat	ESD and motor thermostat alarm	ESD<thermostat, ESD>thermostat
606	ESD<local stop	ESD and torque alarm	ESD<torque limit, ESD>torque limit
607	ESD<local stop	ESD and local stop	ESD<local stop, ESD>local stop
608	ESD<local selector	ESD and local selector in LOCAL	ESD<local selector, ESD>local selector
609	ESD<local selector in OFF	ESD and local selector in OFF	ESD<local selector in OFF, ON=ESD>local selector in OFF
611	ESD<2 speed timer	ESD and 2-speed timer	ESD<2-speed timer, ESD>2-speed timer
602	Present	ESD signal type	ESD carried out: with signal absent or with signal present

Table 3. EFS / PST

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
800	Off	EFS action in case of voltage failure	On/Off selector to perform safe action if main voltage of actuator fails Not used for ICON3000
801	Off	EFS action in case of selector in OFF	On/Off selector to perform safe action if local selector of actuator is in OFF Not used for ICON3000
802	On	Auto-reset	On/Off selector to re-energize the clutch after the configured time
810	30	Reset-delay	Time to re-energize the clutch
811	360	PST period	Period of PST in days
812	12	PST hour	Time of PST in hours
813	10	PST travel	Travel of PST in % of stroke
814	100	Max. T-PST%	Max. T-PST in % of reference
816	Manual	PST mode	Selector Off/manual/man-auto/auto
817	100	Max. T-RET%	Max. T-RET in % of reference
818	1	PST pause	Pause time
819	100	Max. OV-TR%	Max. over-travel in % of stroke

Table 4. Remote and Local Controls

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
121	Off	Remote control type	Off, 4 wires latched, 3 wires push to run, 3 wires instant reverse, 2 wires open if signal off, 2 wires open if signal on
120	Latched	Local control type	Latched, push to run, latched instant reverse, push-to-run relAs5-6
1	On	Close led color	Closed led color=ON=red, OFF=green
2	Off	Open led color	Open led color=ON=red, OFF=green
3	On	Alarm led color	Alarm led color=ON=yellow, OFF=red
30	Off	Remote stop type	Remote stop active if signal is on=make or off=break

Output Relays

Table 5. Monitor Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
201	Enabled	Local STOP pressed	Enabled, disabled
202	Enabled	Local OFF	Enabled, disabled
203	Enabled	ESD - EFS	Enabled, disabled Not used for ICON3000
204	Enabled	Manual operation	Enabled, disabled
206	Enabled	Motor high temperature alarm	Enabled, disabled
207	Enabled	High torque alarm	Enabled, disabled
208	Enabled	Jammed valve alarm	Enabled, disabled
209	Enabled	Low battery alarm	Enabled, disabled

Table 6. AS1 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
220	Open limit	AS1_condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
240	20	AS1 position%	Position% if AS1 condition is position >=% or <=%
231	Make	AS1 contact	Make, break

Table 7. AS2 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
221	Close limit	AS2 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
241	20	AS2 position%	Position% if AS2 condition is position >=% or <=%
232	Make	AS2 contact	Make, break

Table 8. AS3 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
222	Open limit	AS3 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
242	20	AS3 position%	Position% if AS3 condition is position >=% or <=%
233	Make	AS3 contact	Make, break

Table 9. AS4 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
223	Close limit	AS4 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
243	20	AS4 position%	Position% if AS4 condition is position >=% or <=%
234	Make	AS4 contact	Make, break

Table 10. AS5 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1200	Open limit	AS5 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1210	20	AS5 position%	Position% if AS5 condition is position >=% or <=%
1220	Make	AS5 contact	Make, break

Table 11. AS6 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1201	Open limit	AS6 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1211	20	AS6 position%	Position% if AS6 condition is position >=% or <=%
1221	Make	AS6 contact	Make, break

Table 12. AS7 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1202	Open limit	AS7 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1212	20	AS7 position%	Position% if AS7 condition is position >=% or <=%
1222	Make	AS7 contact	Make, break

Table 13. AS8 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1203	Open limit	AS8 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1213	20	AS8 position%	Position% if AS8 condition is position >=% or <=%
1223	Make	AS8 contact	Make, break

Table 14. AS9 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1204	Open limit	AS9 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1214	20	AS9 position%	Position% if AS9 condition is position >=% or <=%
1224	Make	AS9 contact	Make, break

Table 15. AS10 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1205	Open limit	AS10 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1215	20	AS10 position%	Position% if AS10 condition is position >=% or <=%
1225	Make	AS10 contact	Make, break

Table 16. AS11 Relay

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
1206	Open limit	AS11 condition	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/ PST-icon, EFS coil OFF
1216	20	AS11 position%	Position% if AS11 condition is position >=% or <=%
1226	Make	AS11 contact	Make, break

Table 17. 2-Speed Timer

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
51	Off	Status	Off=disable timer in CL, on=enable
55	2	On time in closing	From 2 to 200
56	2	Off time in closing	From 2 to 200
53	0	Start position in closing	% of position where timer operation starts From 0 to 100
54	100	Stop position in closing	% of position where timer operation ends From 0 to 100
52	Off	Status	Off=disable timer in OP, on=enable
59	2	On time in opening	From 2 to 200
60	2	Off time in opening	From 2 to 200
57	0	Start position in opening	% of position where timer operation starts From 0 to 100
58	100	Stop position in opening	% of position where timer operation ends From 0 to 100

Table 18. Miscellaneous

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
531	Standard	Torque mode	Standard, 3 points
103	Absent	Alkaline battery	Present, absent
6	1.01.01	Present date	Present date, dd.mm.yy
7	0.00.00	Present time	Present time, hh.mm.ss
507	20	Torque bypass	From 0 to 20, % of position
144	100	Jammed valve time	From 0 to 100 seconds
235	Enabled	Bluetooth	Enabled, disabled

Table 19. Fail Safe

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
715	Off	Action	Off, close, open, stay put, go to position %
717	10	Delay	Delay before than fail action takes place, from 0 to 255 seconds
716	50	Position	Position % of failsafe if action is “go to position %", from 0 to 100

Table 20. Interlocks

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
708	Off	Interlock in opening	Absent, present, off
709	Off	Interlock in closing	Absent, present, off

Table 21. Positioner

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
710	0.5	Dead band	From “position resolution” to 25.5%
711	6	Motion inhibit	Motion inhibit time in seconds, from 1 to 255
712	0	% min	Standard 0
713	100	% max	Standard 100
701	4 mA = CL	Polarity of input 4 - 20 mA	4 mA = CL, 20 mA = OP

Table 22. Out 4 - 20 mA

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
702	4 mA = CL	Polarity of output 4 - 20 mA	4 mA = CL, 20 mA = OP
718	Position	Output signal	Position mA, torque mA

Table 23. Bus Control

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
408	Off	Status of termination channel 1	Off, On
409	Off	Status of termination channel 2	Off, On
419	Auto	Mode	Channel_1, Channel_2, auto
418	Auto	Modbus baud rate	Auto, 600, 1200, 2400, 4800, 9600, 19200, 38400
406	One	Modbus parity	None, even, odd
407	1	Modbus node	Modbus address, from 0 to 246
423	1	Profibus node	Profibus address, from 1 to 126
400	Open limit	DIN 1	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/PST-icon, EFS coil OFF
401	Open limit	DIN 2	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/PST-icon, EFS coil OFF
402	Open limit	DIN 3	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/PST-icon, EFS coil OFF
403	Open limit	DIN 4	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/PST-icon, EFS coil OFF
404	Open limit	DIN 5	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/PST-icon, EFS coil OFF

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
405	Open limit	DIN 6	Open limit, close limit, position >=%, position <=%, closing, opening, running, blinker, mid-travel, local selected, remote selected, local stop on, ESD/PST-efs, manual operation (handwheel), motor over temperature alarm, over torque alarm, over torque alarm in OP, over torque alarm in CL, valve jammed alarm in OP, valve jammed alarm in CL, valve jammed alarm, low battery alarm, warnings, mid travel alarms, EFS in manual, PST failed, Mains only As8, EFS mid-travel, INTER/PST-icon, EFS coil OFF
411	50	DIN 1 pos%	Position% if DIN 1 = position >= or <=
412	50	DIN 2 pos%	Position% if DIN 2 = position >= or <=
413	50	DIN 3 pos%	Position% if DIN 3 = position >= or <=
414	50	DIN 4 pos%	Position% if DIN 4 = position >= or <=
415	50	DIN 5 pos%	Position% if DIN 5 = position >= or <=
416	50	DIN 6 pos%	Position% if DIN 6 = position >= or <=
417	1	Hart node	Hart address, from 0 to 63
428	1	Profibus redundant node	Profibus address of backup slave, from 1 to 126
425	1	Hart device number	Hart serial number from 0 to 116777200, 3 bytes
426	0	Hart configuration changes	Number of Hart configuration changes, visible only from node report menu

Table 24. Restricted

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
160	1.2	Speed bypass	Speed bypass time. Set value from 0 to 25.5 (standard >1)
508	5	Torque stop zone	Torque stop zone in % of position, from 0 to 20% in OP (or 100 to 80% in CL)
115	1 (ICON-EFS) 4 (F01)	Direction test	Direction test (F01), from 0 to 255 (standard 4), for ICON/EFS standard 1
145	400	Voltage span	Voltage span, from 0 to 1000 (change at least 1 V to enter new value)
107	Off	1 P.man	Disabled, enabled
116	Base	Hardware configuration	Base, lonworks, modbus, profibus-DPV0, modbus_m, FF, hart, profibus-DPV1, profibus-DPV1r
700	Disabled	Positioner	Disabled, enabled
704	4 - 20 mA	Position request type	From 4 - 20 mA input or from bus
703	Disabled	Failsafe enable	Disabled, enabled
421	Torque	Bus An. Out.	Torque, torque + temperature (only FF)
706	Absent	Ain/Aout card enable	Present, absent
705	Disable	EXT “Bluetooth” enable	Enable, disable
719	Disable	IrDA enable	Enable, disable
410	I24	Bus card protocol	Communication protocol among base and bus cards, I20 or I24
422	Disable	PID (not available)	Disable, enable (always disabled)

Table 25. Reserved

Actuator Setup			
Obj n°	**Value**	**Function**	**Description**
148	Icon	SW type	ICON, F01
173	I24 V4	Terminal board type	I24 V4, 5 relays, 8/9 relays, 12 relays, I24 Gold PR
105	Mask	Additional variables	Mask, view
4	Auto	Backlight	Auto, on
134	1.5	Reversal delay	Reversal delay, from 0 to 5.5 seconds (standard > 1)
146	200	Volt span bit	Voltage span in bit, can only be read
720	650	4 mA in	Bit corresponding to 4 mA input
721	3500	20 mA in	Bit corresponding to 20 mA input
722	650	4 mA out	Bit corresponding to 4 mA output
723	3500	20 mA out	bit corresponding to 20 mA output
161	451	Curr sens 2 A	Bits when current is 2 A
162	382	Curr sens 3.5 A	Bits when current is 3.5 A
163	387	Curr sens 7 A	Bits when current is 7 A
164	443	Curr sens 15 A	Bits when current is 15 A
165	441	Curr sens 30 A	Bits when current is 30 A
424	10	Speed filter	From 0 to 255
170	1	Base heater reference	°C reference of heater on base card, from –40 to 50 °C
171	-2	LCD heater reference	°C reference of heater on diplay card, from –40 to 50 °C
172	-1	Terminal board heater reference	°C reference of heater on terminal board, from –40 to 50 °C
707	Disable	Sleep mode	Enable, disable SLEEP function
238	Off	MR in SLEEP	On/off of monitor relay in sleep mode
576	Standard	Torque function	Mode to evaluate torque, standard or advanced
533	Standard	Interlock mode	Standard or advanced (local+interlock OP/CL)
420	Disable	New FW	Disable or enable, set to “enable” to download a new firmware
429	Disable	Serial cmd	Disable or enable OP/CL/ST commands by BLT or serial RS232
430	Disable	Loc/Rem	Enable or disable “Local + Remote” control mode
431	s/n°	Bluetooth code	Select Bluetooth code or valve tag
815	75	EFS-duty %	Duty of EFS clutch (used only in EFS actuator) Not used for ICON3000
803	Close	Spring action	Actuator movement under
804	On	EFS electrical cmd	Enable/disable of electrical cmd in direction of safe action Not used for ICON3000
805	PST	ESD input mode	Selector of ESD input of actuator, PST or EFS (electrical cmd. Not used for ICON3000
806	Absent	EFS signal type	Option Absent/present in case of ESD input used as EFS cmd. Not used for ICON3000
133	0	CMD-Filter	From 0 to 30 filter of OP/CL/ST commands signals
135	0	ESD-INT Filter	From 0 to 30 filter of ESD/INT commands signal

Table 26. Serial Number

Nameplate			
Obj n°	**Value**	**Function**	**Description**
300	031234E01003	Serial number	Max. 12 characters

Table 27. Actuator Size

Nameplate			
Obj n°	**Value**	**Function**	**Description**
301	ICON-010-40-90	Actuator size	Max. 28 characters

Table 28. Wiring Diagram

Nameplate			
Obj n°	**Value**	**Function**	**Description**
302	WD-80-AT-000	Wiring diagram	Max. 28 characters

Table 29. Enclosure

Nameplate			
Obj n°	**Value**	**Function**	**Description**
303	Eex-d-IIC	Enclosure	Max. 28 characters

Table 30. Certificate

Nameplate			
Obj n°	**Value**	**Function**	**Description**
304	ATEX	Certificate	Max. 28 characters

Table 31. Lubricant

Nameplate			
Obj n°	**Value**	**Function**	**Description**
305	SHELL_TIVELA	Lubricant	Max. 28 characters

Table 32. Torque / Thrust

Nameplate			
Obj n°	**Value**	**Function**	**Description**
532	Nm	Torque, thrust engineering unit	ft-lbf, Nm, lb, KN
307	90	Torque, thrust nominal value	Max. 28 characters

Table 33. Actuator Speed

Nameplate			
Obj n°	**Value**	**Function**	**Description**
132	RPM	Actuator speed engineering unit	s/90°, RPM, mm/s, in/s
308	48	Actuator speed value	Actuator speed, max. 28 characters

Table 34. Power Supply

Nameplate			
Obj n°	**Value**	**Function**	**Description**
111	AC3ph	Power type	AC3ph, AC1ph, DC
110	400	Supply voltage value	Nominal voltage supply value
104	50 Hz	Supply voltage frequency	50 Hz, 60 Hz

Table 35. Motor Data

Nameplate			
Obj n°	**Value**	**Function**	**Description**
113	AC3ph	Motor supply type	AC3ph, AC1ph, DC
122	0.5	Motor nominal power (rating)	KW, from 0 to 99.9
123	0.3	Motor current In (motor nominal current)	A, from 0 to 99.9
124	0.4	Motor current Is (seating current)	A, from 0 to 99.9
125	0.5	Motor current Icc (locked rotor current)	A, from 0 to 999,9
126	S2-15 min.	Motor service	S2-15 min., S4-25%-60start/h, S4-25%-200start/h, S4-25%-600start/h, S4-25%-1200start/h, S4-25%-3600start/h, S9 continuous
112	6	Motor poles	From 0 to 32
427	SM32	Motor code	Max. 28 characters
577	10	Gears ratio	Reduction ratio of gears, from 1 to 1000

Table 36. Test Date

Nameplate			
Obj n°	**Value**	**Function**	**Description**
306	17.04.04	Test date	Factory test date, (dd.mm.yy)

Table 37. Revision

Nameplate			
Obj n°	**Value**	**Function**	**Description**
114	4	HW revision	Hardware revision
5	2.03	SW H8	Software revision H8 base card, read only from ICON firmware
8	1.10	SW PIC	Software revision PIC base card, read only from ICON firmware

Table 38. Torque Sensor

Nameplate			
Obj n°	**Value**	**Function**	**Description**
536	700	F01tor op 100%	Value of potentiometer at 100% of opening torque, in F01. Not used for ICON3000
537	600	F01tor op 50%	Value of potentiometer at 50% of opening torque, in F01. Not used for ICON3000
538	400	F01tor op 50%	Value of potentiometer at 50% of closing torque, in F01. Not used for ICON3000
539	300	F01tor op 100%	Value of potentiometer at 100% of closing torque, in F01. Not used for ICON3000
540	500	I2tor op 0% +5%	Opening speed with torque 0% and voltage +5% of nominal
541	450	I2tor op 40% +5%	Opening speed with torque 40% and voltage +5% of nominal
542	400	I2tor op 70% +5%	Opening speed with torque 70% and voltage +5% of nominal
543	300	I2tor op 100% +5%	Opening speed with torque 100% and voltage +5% of nominal
577	10	Gears ratio	Reduction ratio of gears, from 1 to 1000
545	440	I2tor op 40% -5%	Opening speed with torque 40% and voltage -5% of nominal
546	390	I2tor op 70% -5%	Opening speed with torque 70% and voltage -5% of nominal
547	290	I2tor op 100% -5%	Opening speed with torque 100% and voltage -5% of nominal
548	600	I2tor cl 0% +5%	Closing speed with torque 0% and voltage +5% of nominal
549	550	I2tor cl 40% +5%	Closing speed with torque 40% and voltage +5% of nominal
550	500	I2tor cl 70% +5%	Closing speed with torque 70% and voltage +5% of nominal
551	450	I2tor cl 100% +5%	Closing speed with torque 100% and voltage +5% of nominal
553	540	I2tor cl 40% -5%	Closing speed with torque 40% and voltage -5% of nominal
554	490	I2tor cl 70% -5%	Closing speed with torque 70% and voltage -5% of nominal
555	430	I2tor cl 100% -5%	Closing speed with torque 100% and voltage -5% of nominal
580	400	I2tor voltage	Voltage of torque calibration, from 0 to 1000 V
106	50 Hz	I2tor freq.	50 Hz, 60 Hz, frequency of torque calibration
509	2	I2tor Ktemp	Temperature compensation, from 1 to 20
994	70	Torque-set CL (ICON)	Value of torque set in factory
995	70	Torque-set OP (ICON)	Value of torque set in factory
996	70	Torque-set CL (F01)	Value of torque set in factory. Not used for ICON3000
997	70	Torque-set OP (F01)	Value of torque set in factory. Not used for ICON3000

Table 39.

Valve Data			
Obj n°	**Value**	**Function**	**Description**
154	f5000	Valve tag name	Max. 28 characters
156	q234f	Valve serial number	Max. 28 characters
990	-	Manufacturer	Max. 28 characters
991	-	Break-OP torque	Max. 28 characters
992	-	Max. stem thrust	Max. 28 characters
993	-	Flange type	Max. 28 characters
542	400	I2tor op 70% +5%	Opening speed with torque 70% and voltage +5% of nominal
543	300	I2tor op 100% +5%	Opening speed with torque 100% and voltage +5% of nominal
996	70	Torque-set CL (F01)	Value of torque set in factory. Not used for ICON3000
997	70	Torque-set OP (F01)	Value of torque set in factory. Not used for ICON3000

Operation Log

Table 40. General Log

Maintenance			
Obj n°	**Value**	**Function**	**Description**
924	10	Opening time	Seconds, Read-only
925	10	Closing time	Seconds, Read-only
920	1200	Contactor cycles	Resolution 100, Read-only
922	1020	Motor run time	Hours, Read-only
928	300	No power time	Hours, Read-only
926	13	Utilization rate	%, Read-only
956	-30	Min. temperature	°C, Read-only
957	70	Max. temperature	°C, Read-only
958	-34	Min. terminal board temperature	°C, Read-only
959	72	Max. terminal board temperature	°C, Read-only
961	80	Max. motor temperature	°C, Read-only
964	2	Motor thermostat alarms	Read-only
965	2	Torque alarms	Read-only

Table 41. Recent Log

Maintenance			
Obj n°	**Value**	**Function**	**Description**
921	0	Recent contactor cycles	Resolution 100, Read-only
923	0	Recent motor run time	Hours, Read-only
929	0	Recent no power time	Seconds, Read-only
927	0	Recent utilization rate	%, Read-only
950	0	Recent min temperature	°C, Read-only
951	0	Recent max temperature	°C, Read-only
952	0	Recent min term. board temper.	°C, Read-only
953	0	Recent max term. board temper.	°C, Read-only
955	0	Recent max motor temperature	°C, Read-only
962	0	Recent motor thermostat alarms	Read-only
963	0	Recent torque alarms	Read-only
964	2	Motor thermostat alarms	Read-only
965	2	Torque alarms	Read-only

Table 42. Torque Profile

Maintenance			
Obj n°	**Value**	**Function**	**Description**
568	50	Breakout in opening	Read-only
570	50	Peak run in opening	Read-only
572	50	Ending in opening	Read-only
574	1.01.00	Op. torque profile date	Read-only
560	50	Breakout in closing	Read-only
562	50	Peak run in closing	Read-only
564	50	Ending in closing	Read-only
566	1.01.00	Cl. torque profile date	Read-only
569	50	Reference breakout in op.	Read-only
571	50	Reference peak run in op.	Read-only
573	50	Reference ending in op.	Read-only
575	1.01.00	Reference op. torque profile date	Read-only
561	50	Reference breakout in cl.	Read-only
563	50	Reference peak run in cl.	Read-only
565	50	Reference ending in cl.	Read-only
567	1.01.00	Reference cl. torque profile date	Read-only

Alarm Log

Table 43. Alarms

Maintenance			
Obj n°	**Value**	**Function**	**Description**
900	1.1.01_00.00.00_0	Alarm 0	Alarm register 0
901	1.1.01_00.00.00_0	Alarm 1	Alarm register 1
902	1.1.01_00.00.00_0	Alarm 2	alarm register 2
903	1.1.01_00.00.00_0	Alarm 3	Alarm register 3
904	1.1.01_00.00.00_0	Alarm 4	Alarm register 4
905	0	Oldest alarm register	Obj number of oldest alarm

Note: In the FW version > 5.50, ALARM LOG is read by the obj -251, -252, -253, -255.

Table 44. Warnings

Maintenance			
Obj n°	**Value**	**Function**	**Description**
910	1.1.01_00.00.00_0	Warning 0	Warning 0 register
911	1.1.01_00.00.00_0	Warning 1	Warning 1 register
912	1.1.01_00.00.00_0	Warning 2	Warning 2 register
913	1.1.01_00.00.00_0	Warning 3	Warning 3 register
914	1.1.01_00.00.00_0	Warning 4	Warning 4 register
915	0	Oldest warning register	Obj number of oldest warning

Note: In the FW version > 5.50, ALARM LOG is read by the obj -255, -256, -257, -258.

Table 45. Maintenance Date

Maintenance			
Obj n°	**Value**	**Function**	**Description**
151	19.04.04	Last date	dd.mm.yy
152	0,043506944	Next date	dd.mm.yy
309	17.014.04	Start-up date	dd.mm.yy
310	1.01.02	Recent log date	Date of the last "clear recent log" that is: start date of the recent log registers
914	1.1.01_00.00.00_0	Warning 4	Warning 4 register
915	0	Oldest warning register	Obj number of oldest warning

Table 46. Only Read

Maintenance			
Obj n°	**Value**	**Function**	**Description**
14	1	Identity	4 characters = ICON, F01b, 4 characters = 4/20, base, 11Rb, 4 characters = language = efsi, epsi, from firmware
9999	-	CRC	Eeprom memory error
150	0	Password	Password
141	English	Language	English, Italiano, Espanol, Portogues, Italiana, Francais, etc.

Section 5: Alarm "Hardware n°"

If the diagnostic program of the ICON3000 detects a malfunction in any of the hardware modules, a HARDWARE n° alarm is generated (refer to the ICON3000 IOM; Diagnostic Messages).

The number “n°” indicates the module that is not working. The problem may be due to malfunction of a module, incorrect wiring between modules, or an incorrect setting.

The following hardware alarms can be detected:

Hardware 1

- Incorrect coding of local push-buttons and selector.
  The base card detects the status of the local push-buttons and selector via 5 Hall effect sensors. Four magnets, located on the cover of the local operator interface, provide the magnetic field to the sensor. The alarm may be attributable to incorrect positioning of magnets in the cover.

Hardware 2

- Incorrect configuration of the “Ain/Aout” optional module.

Hardware 3

- No communication between the “Ain/Aout” and “base” cards.
  Turn off the power and check that the base card is equipped with the “Ain/Aout” optional card. Cycle power on the actuator, observe the first message that appears on the display, and then check the following parameters in the “RESTRICTED” menu routines:
  - Term board: should be set to “I24 V4.”
  - Card Ain/Aout: should be set to “PRESENT.”

  If the settings are incorrect, enter the correct values and then a cycle power on the actuator. If the settings are correct, check the base card and the optional module “Ain/Aout.”

Hardware 4

- Incorrect configuration of type of terminal board.

Hardware 5

- No communication between the terminal board and base card.
  Turn off the power and check the base card to see if it is equipped with the “Ain/Aout” or “TERMINAL BOARD ADAPTOR” card. Cycle power on the actuator and check the following parameters in the “RESTRICTED” menu routines:
  - Term board: should be set to “I24 V4.”
  - Card Ain/Aout: should be set to “PRESENT” if the “Ain/Aout” card is present and should be set to “ABSENT” if the “TERMINAL BOARD ADAPTOR” card is present. In the latter case check also that the 5 dip-switches on the card are in the “open” position.

  If the settings are wrong, enter the correct values and then proceed to cycle power on the actuator. If the settings are correct, check the base card, the “Ain/Aout” or “TERMINAL BOARD ADAPTOR” cards, the terminal board, and the wiring between the terminal board and base card (see Section 6: Terminal Board Types).

Hardware 6

- Incorrect configuration of actuator type "ICON."
  This alarm is generated when:
  - The parameter “SW type” in the “RESTRICTED” menu is set to “ICON,” but the “POTENTIOMETER” card is present on the base card.

Hardware 7

- Incorrect configuration of type of bus card.

Hardware 8

- No communication between the bus card and base card.
  Turn off the power and check that the base card is equipped with the correct bus interface card. Cycle power on the actuator and check the following parameters in the “RESTRICTED” menu routines:
  - HW config: should be set to the “option” corresponding to the bus interface present on the base card.
  - Bus protocol: should be set to “I24” or “I20” according to the relevant bus protocol instruction manual.

Hardware 9

- Reserved. Not used for ICON3000.

Hardware 10

- Reserved. Not used for ICON3000.

Hardware 11

- No communication between the bus (Profibus redundant card) and logic card. Turn off the power and check that the base card is equipped with the correct bus interface card.
  Cycle power on the actuator and check the following parameters in the “RESTRICTED” menu routines:
  - HW config: should be set to the “option” corresponding to the bus interface present on the base card.
  - Bus protocol: should be set to “I24” or “I20” according to the relevant bus protocol instruction manual.

Hardware 12

- No communication between the encoder and logic card.
  Turn off the power and check the encoder cable; if damaged, it must be replaced.
  Cycle power on the actuator to check if the problem is corrected.
  If the problem is not corrected, replace the Encoder. Cycle power on the actuator to check if the problem is resolved.
  If the problem is still not corrected, replace the Logic Card. Cycle power on the actuator to check if the problem is resolved.

Hardware 13

- Encoder damaged or incorrectly configured.
  Turn off the power and check the mechanical condition of the encoder. If damaged, it must be replaced. Cycle power on the actuator to check if the problem is corrected.
  If the problem still not corrected, replace the Logic Card. Cycle power on the actuator to check if the problem is resolved.

Section 6: Terminal Board Types

The features of the ICON3000 terminal board are described in the the ICON3000 IOM. If the ICON3000 has a 4 - 20 mA analog input and output, the optional card “Ain/Aout” is plugged onto the base card in place of the “TERMINAL BOARD ADAPTOR” card.
The following settings should be performed in the “RESTRICTED” menu routines:

- Term board: set to “I24 V4.”
- Card Ain/Aout: set to “PRESENT” if the card “Ain/Aout” is plugged onto the base card, or set to “ABSENT” if instead the “TERMINAL BOARD ADAPTOR” card is installed.
  The 5 dip-switches on the TERMINAL BOARD ADAPTOR card should be set to “open” (OFF).

Figure 4 ICON3000 Terminal Board Cards

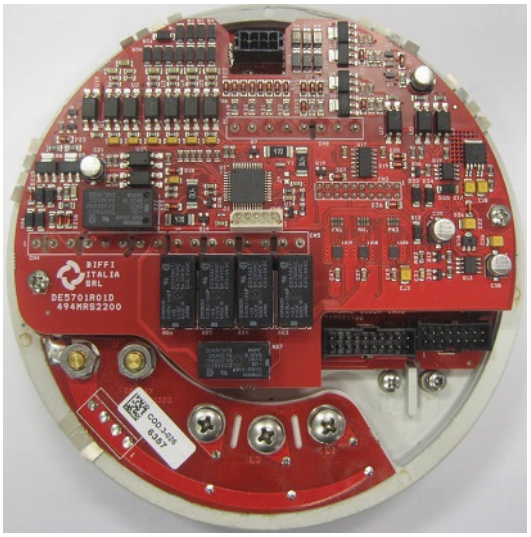
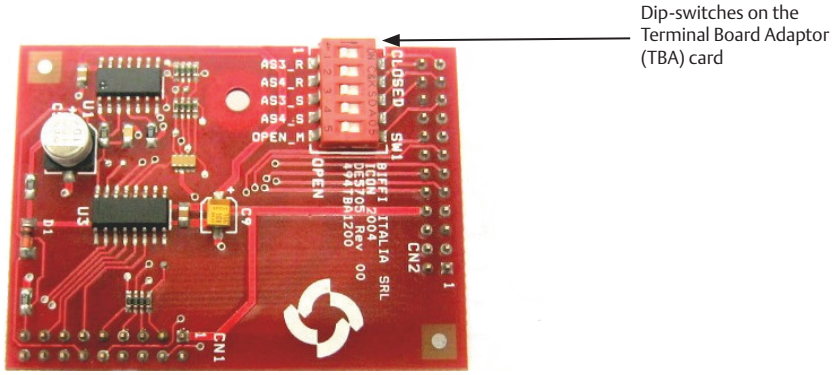


Figure 5



6.1 Terminal Board Adaptor (TBA) Card

This is an optional module of the ICON3000 base card.

The “TERMINAL BOARD ADAPTOR” card is present as standard. The 5 dip-switches on the “TERMINAL BOARD ADAPTOR” card must be placed in the "open" position. If the “Ain/Aout” optional module is required, the “TERMINAL BOARD ADAPTOR” card is removed from base card and the “Ain/Aout” card is mounted in the same position.

Figure 6 Ain/Aout card

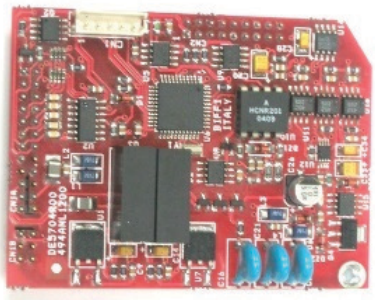


Figure 7 Terminal Board Adaptor card

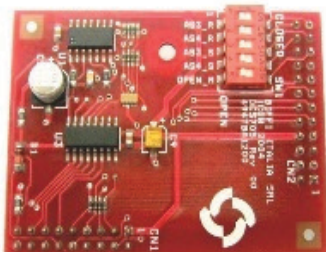
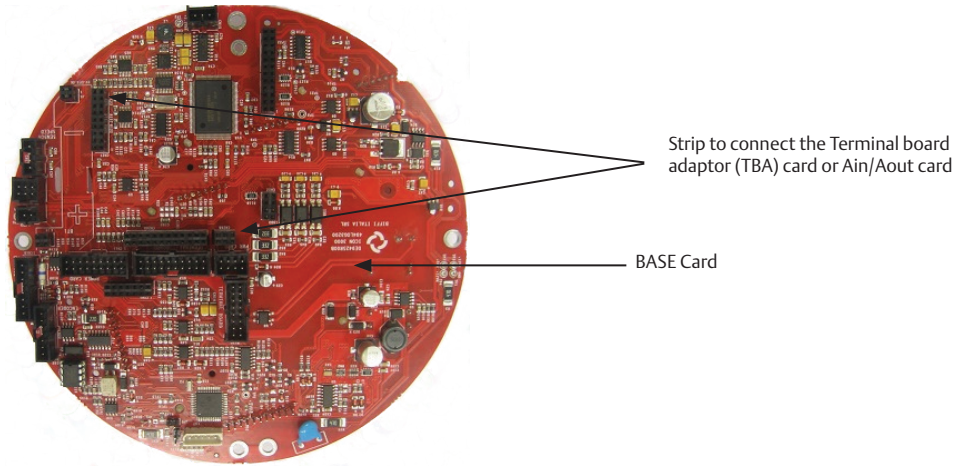


Figure 8



Section 7: Configuration

ICON3000 configuration and firmware upgrades can be performed via wired connection to RS232 service serial port or via BluetoothTM wireless connection.

The tools that can be used to perform the mentioned above functions are:

- A-Manager
- DCMlink

Refer to the specific IOM for the dedicated guide.

Section 8: Test Point and Connector Base Card

Figure 9

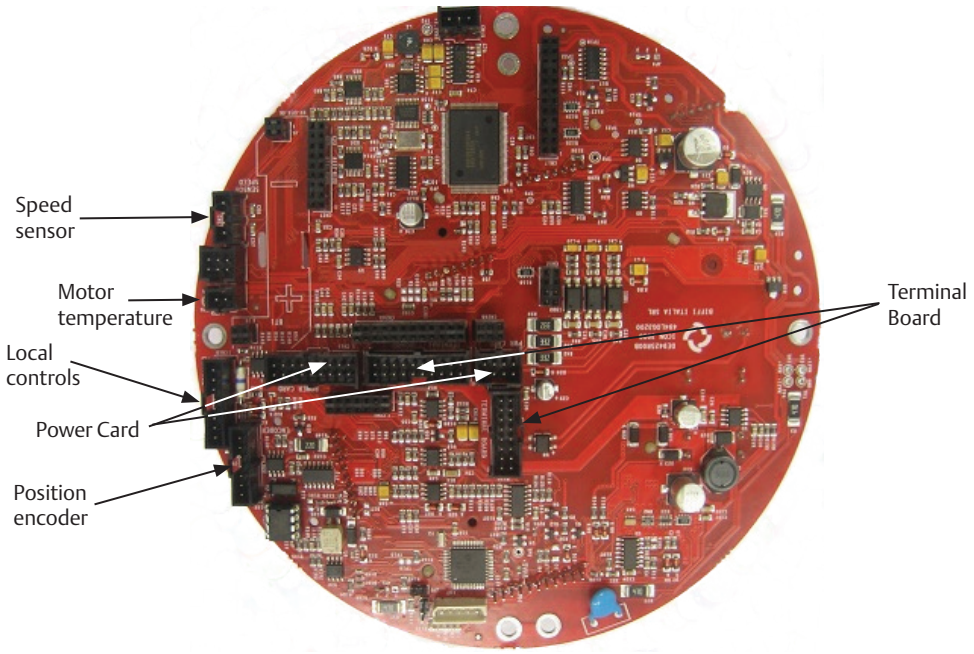
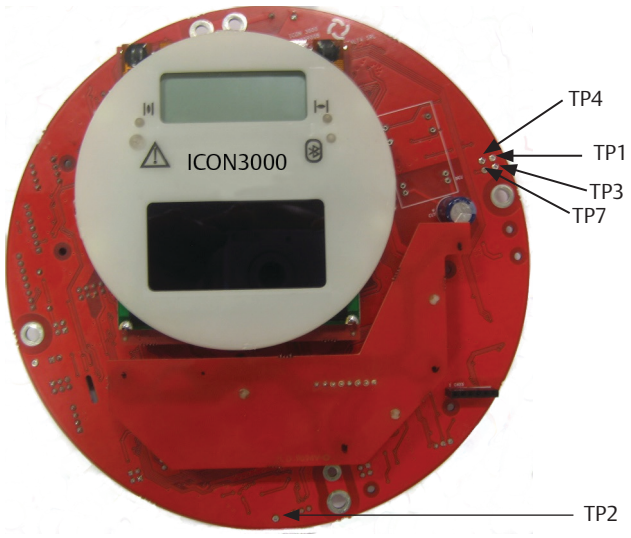


Figure 10

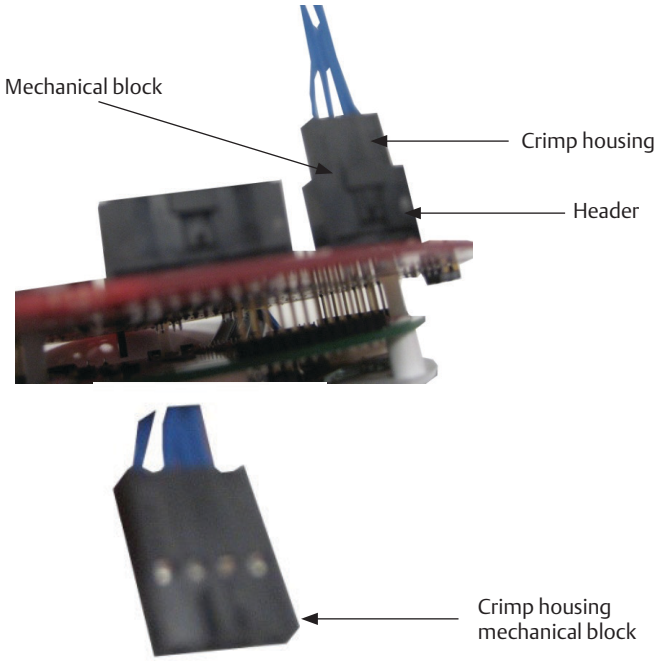


Test Points:

- TP1: 0 Vm
- TP2: 3.3 Vh8
- TP3: 13 Vm
- TP4: 12 Vm (in case of power supply by DC/DC converter)
- TP7: 5 Vm

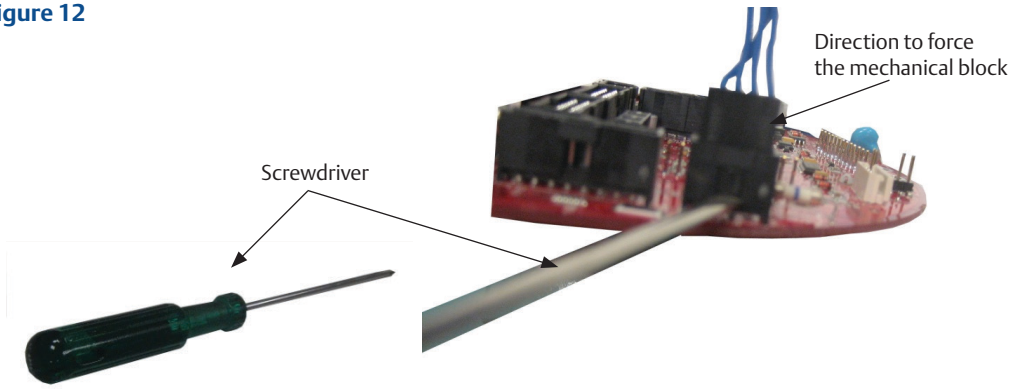
The connector is composed of two pieces: header and crimp housing. The header is welded to the printed circuit board and the crimp housing is connected to wires. The mechanical block (see Figure 11) part of the crimp housing can complicate the disconnection of the crimp housing from the header, which if done without due care can potentially result in damage to the connector and/or wires.

Figure 11



Disconnection of the header and crimp housing can be facilitated with a screwdriver. Use the screwdriver to force the mechanical block in the direction indicated in Figure 12 below until the crimp housing becomes free from the header.

Figure 12



Section 9: Firmware of DE9425 HW REV ≥ 00B

BASE card DE 5703 HW rev ≥ 04 works only with:

- FW H8S rev ≥ 9.00
- FW PIC rev ≥ 8.00

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