

## EP3 SERIAL COMMUNICATION

**Communication Protocol:** DNP 3

**Transmission Rate:** 1,200 to 57,600 (Auto Baud Rate)

**Data Bites:** 8

**Parity:** None

**Stop bits:** 1

Address DNP 3	Reading Range	Bits Index	State	Description Point Name	Written Reading	Scale
1	0 – 2000	-	-	Sensor alarm temperature 1;	E / L	1:10
2	0 – 2000	-	-	Sensor alarm temperature 2;	E / L	1:10
3	0 – 2000	-	-	Sensor alarm temperature 3;	E / L	1:10
9	0 – 100	-	-	Alarm Hysteresis Value.	E / L	1:10
10	0 – 2000	-	-	Sensor shutdown temperature 1;	E / L	1:10
11	0 – 2000	-	-	Sensor shutdown temperature 2;	E / L	1:10
12	0 – 2000	-	-	Sensor shutdown temperature 3;	E / L	1:10
18	0 – 20	-	-	Delay time for shutdown in minutes.	E / L	1:1
28	-	-		Registrar – Commands:	-	
		2	1	Reset of Maximum Temperatures;	L / E	-
		3	1	Reset da CPU;	L / E	-
29	0 – 2000	-	-	Temperature measured by sensor 1;	L	1:10
30	0 – 2000	-	-	Temperature measured by sensor 2;	L	1:10
31	0-2000	-	-	Temperature measured by sensor 3;	L	1:10
37	0-2000	-	-	Maximum Temperature reached by Sensor 1;	L	1:10
38	0-2000	-	-	Maximum Temperature reached by Sensor 2;	L	1:10
39	0-2000	-	-	Maximum Temperature reached by Sensor 3;	L	1:10

**CONTINUATION OF SERIAL COMMUNICATION TABLE EP3**

Address DNP 3	Reading Range	Bits Index	State	Description Point Name	Written Reading	Scale
42	-	-		Recorder – Status of Sensors:	-	
		0	0	Sensor 1 disabled;	L / E	-
			1	Sensor 1 enabled;	L / E	-
		1	0	Sensor 2 disabled;	L / E	-
			1	Sensor 2 enabled;	L / E	-
		2	0	Sensor 3 disabled;	L / E	-
			1	Sensor 3 enabled;	L / E	-
45	-	-		Recorder – Alarm Status:	-	
		0	1	High temperature alarm on Sensor 1;	L	-
		1	1	High temperature alarm on Sensor 2;	L	-
		2	1	High temperature alarm on Sensor 3;	L	-
		8	1	High temperature alarm relay triggered;	L	-
46	-	-		Registrar – Count Status for Shutdown:	-	
		0	1	Count for High Temperature Shutdown of Sensor 1;	L	-
		1	1	Count for High Temperature Shutdown of Sensor 2;	L	-
		2	1	Count for High Temperature Shutdown of Sensor 3;	L	-
		8	1	Count of time for Shutdown triggered;	L	
47	-	-		Registrar – Status of Shutdowns:	-	
		0	1	High Temperature Shutdown Sensor 1	L	-
		1	1	High Temperature Shutdown Sensor 2	L	-
		2	1	High Temperature Shutdown Sensor 3	L	-
		8	1	High Temperature Shutdown triggered;	L	-

**CONTINUATION OF SERIAL COMMUNICATION TABLE EP3**

Address DNP 3	Reading Range	Bits Index	State	Description Point Name	Written Reading	Scale
49	-	-		Registrar – Failure Status:	L	-
		0	1	Reading Failure on Sensor 1;	L	-
		1	1	Sensor 2 Reading Failure;	L	-
		2	1	Sensor 3 Reading Failure;	L	-
		8	1	Sensor Failure triggered;	L	-
50	1-254	-	-	Serial Network Address	L	-
56	0 – 2	-		Registrar - Display Presentation Mode:	-	
		-	0	Fixed display at the highest temperature;	L / E	-
		-	1	Sets the display to SCAN mode;	L / E	-
		-	2	Sets the display to Manual mode;	L / E	-
57	0 - 7	-		Recorder – Logic of activation of the relays:	L / E	-
		0	0	Normal relay logic 1;	L / E	-
			1	Logic of the inverse relay 1;	L / E	-
		1	0	Normal relay logic 2;	L / E	-
			1	Inverse relay logic 2;	L / E	-
		2	0	Normal relay logic 3;	L / E	-
			1	Inverse relay logic 3;	L / E	-
60	1-31	-	-	Calibration Day;	L	-
61	1-12	-	-	Calibration Month;	L	-
62	2017-2099	-	-	Year of Calibration;	L	-
63	0-65535	-	-	Equipment Serial Number – LSB;	L	-
64	0-255	-	-	Equipment Serial Number – MSB;	L	-

**DNP V3.00****DEVICE PROFILE DOCUMENT**

Vendor Name: ELECTRON DO BRASIL

Device Name: EP3 Thermal Protection Relay

Highest DNP Level Supported:

For Requests: 1

For Responses: 1

Device Function:

Master ☐ Slave ☒

Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Level Supported (the complete list is described in the attached table).

Supports class data requests only and SBO and direct operate analog commands. Answers are analog group objects variations 4, for static data (in class 0 requests), and variation 2, for event data (events are reported in class 1, 2 or 3 request)

Maximum Data Link Frame Size  
(bytes):Transmitted 292  
Received (must be 292)Maximum Application Fragment Size  
(bytes):Transmitted 1024  
Received 249

Maximum Data Link Retries:

- ☒ None  
☐ Fixed at \_\_\_\_\_  
☐ Configurable, range \_\_\_\_ to \_\_\_\_

Maximum Application Layer Retries:

- ☒ None  
☐ Configurable, range \_\_\_\_ to \_\_\_\_

## Requires Application Layer Confirmation:

- ☐ Never  
☐ Always  
☒ Sometimes if "sometimes", when? Sending analog events  
☐ Configurable if "configurable", how? \_\_\_\_\_
- 

## Requires Application Layer Confirmation:

- ☐ Never  
☐ Always (not recommended)  
☒ When reporting Event Data (Slave device only)  
☐ When sending multi-fragment responses (Slave devices only)  
☐ Sometimes if "sometimes", when? \_\_\_\_\_  
☐ Configurable if "configurable", how? \_\_\_\_\_
- 

## Timeouts while waiting for:

- |                         |  |   |                                   |                                       |
|-------------------------|--|---|-----------------------------------|---------------------------------------|
| Data Link Confirm       | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable |
| Complete Appl. Fragment | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable |
| Application Confirm     | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable |
| Complete Appl. Response | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable |

Others \_\_\_\_\_

Attach explanation if "Variable" or "Configurable" was checked for any timeout.

## Sends/Executes Control Operations:

- |                      |   |                                 |   |                                       |
|----------------------|---|---------------------------------|---|---------------------------------------|
| WRITE Binary Outputs | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes            | <input type="checkbox"/> Configurable |
| SELECT/OPERATE       | <input type="checkbox"/> Never            | <input type="checkbox"/> Always | <input checked="" type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| DIRECT OPERATE       | <input type="checkbox"/> Never            | <input type="checkbox"/> Always | <input checked="" type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |

DIRECT OPERATE – NO ACK	<input type="checkbox"/> Never	<input type="checkbox"/> Always	Sometimes	<input type="checkbox"/> Configurable
Count > 1	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Pulse On	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Pulse Off	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Latch On	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Latch Off	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Queue	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable
Clear Queue	<input checked="" type="checkbox"/> Never	<input type="checkbox"/> Always	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Configurable

Attach explanation if “Sometimes” or “Configurable” was checked for any operation.

Accepts analog commands only, in SBO or direct operate mode

### FILL OUT THE FOLLOWING ITEM FOR MASTER DEVICER ONLY

Expects Binary Input Change Events:

- ☐ Either time-tagged or non-time-tagged for a single event
- ☐ Both time-tagged and non-time-tagged for a single event
- ☐ Configurable (attach explanation)

### FILL OUT THE FOLLOWING ITEMS FOR SLAVE DEVICES ONLY

Reports Binary Input Change Events  
When no specific variation requested:

- ☒ Never
- ☐ Only time-tagged
- ☐ Only non-time-tagged
- ☐ Configurable to send both, one or the other (attach explanation)

Reports time-tagged Binary  
Input Change Events when no  
Specific variation requested:

- ☒ Never
- ☐ Binary Input Change With Time
- ☐ Binary Input Change With Relative Time
- ☐ Configurable (attach explanation)

Sends Unsolicited Responses:

- ☒ Never
- ☐ Configurable (attach explanation)
- ☐ Only certain objects  
Sometimes (attach explanation)
- ☐ ENABLE/DISABLE UNSOLICITED  
Function codes supported

Sends Static Data Unsolicited  
Responses:

- ☒ Never
- ☐ When Device Restarts
- ☐ When Status Flags Change
- No other options are permitted

Default Counter Object/Variation:

- ☒ No Counters Reported
- ☐ Configurable (attach explanation)
- ☐ Default Object \_\_\_\_\_  
Default Variation \_\_\_\_\_
- ☐ Point-by-point list attached

Counters Roll Over at:

- ☒ No Counters Reported
- ☐ Configurable (attach explanation)
- ☐ 16 Bits
- ☐ 32 Bits
- ☐ Other Value \_\_\_\_\_
- ☐ Point-by-point list attached

Sends Mult-Fragment Responses: ☐ Yes ☒ No

OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
Obj	Where	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes	Qual Codes (hex)
30	4	16 Bit Analog Input without Flag			129	00
32	0	Analog Change Event – All Variations				
32	1	32 Bit Analog Change Event without Time				
32	2	16 Bit Analog Change Event without Time			129	17
41	1	32 Bit Analog Output Block	3,4,5,6	17, 28	129	Echo of request
41	2	16 Bit Analog Output Block	3,4,5,6	17, 28	129	Echo of request
50	1	Time and Date	2	07 quantity = 1		
60	0	Not Defined				
60	1	Class 0 Date	1	06		
60	2	Class 1 Date	1	06,07,08		
60	3	Class 2 Date	1	06,07,08		
60	4	Class 3 Date	1	06,07,08		
70	1	File Identifier				
80	1	Internal Indications	2	00 index = 7		