A1387A

User's Manual

ESP302-GPIB-ADPT

ESP302 GPIB to Serial Adaptor

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MKS Instruments, Inc. warrants that this product will be free from defects in material and workmanship and will comply with MKS published specifications at the time of sale for a period of one year from date of shipment. If found to be defective during the warranty period, the product will either be repaired or replaced at MKS option.

To exercise this warranty, write or call your local MKS office or representative. You will be given prompt assistance and return instructions. Send the product, freight prepaid, to the indicated service facility. Repairs will be made, and the instrument returned freight prepaid. Repaired products are warranted for the remainder of the original warranty period or 90 days, whichever occurs last.

Limitation of Warranty

The above warranties do not apply to products which have been repaired or modified without MKS written approval, or products subjected to unusual physical, thermal or electrical stress, improper installation, misuse, abuse, accident or negligence in use, storage, transportation or handling.

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☒ Low Voltage Directive (LVD) – 2014/35/EU
☒ Restriction of Hazardous Substances Directive (RoHS3) – (EU) 2015/863(7)

Standard(s) to which conformity is declared:
☒EN 61326-1:2013 – (EMC)
☒EN 61010-1:2010 + AMD 1:2016 (Ed 3) – (Safety)

Emissions:
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Immunity:
☒IEC 61000-4-2:2008 EMC/Electrostatic Discharge Immunity Test
☒IEC 61000-4-3:2006 2006+AMD1:2007+AMD2:2010 EMC/Radiated Radio - Frequency Electromagnetic Field Immunity Test
☒IEC 61000-4-4:2012 EMC/Electrical Fast Transient/Burst Immunity Test
☒IEC 61000-4-5:2014 + AMD 1:2017 EMC/Surge Immunity Test (3)
☒IEC 61000-4-6:2013 EMC/Conducted Disturbances induced by Radio Frequency Fields Immunity Test
☒IEC 61000-4-11:2004 + AMD 1:2017 EMC/Voltage Dips, Short Interruptions and Variations Immunity Test (5)

Manufacturers Name: MKS Instruments, Inc. Andover, MA, USA

Importer's Name & Location: /

Equipment Type/Description: **ESP302 GPIB to Serial Adaptor**

Model Number(s) (6): **ESP302-GPIB-ADPT**

The object of the declaration described above is in conformity with the relevant Community harmonization legislation. MKS product conforms to the above Directive(s) and Standard(s) only when installed in accordance with manufacturer's specifications. This declaration has been issued under the sole responsibility of the manufacturer.

Date: 11/09/2021

Le Cointe Hervé
Quality Director

3) Applicable to AC powered product; DC powered connections and may connect to a D.C. distribution network.
5)Applicable to AC powered product only.
6) Compliance of the above model numbers requires the use of a braided shielded cable properly terminated at both ends – if so noted in the MKS Instruction Manual.
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Standard(s) to which conformity is declared:
☒BS EN 61326-1:2013 – (EMC)
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Preface

CONFIDENTIALITY & PROPRIETARY RIGHTS

Reservation of Title

The MKS Instruments, Inc. Programs and all materials furnished or produced in connection with them ("Related Materials") contain trade secrets of MKS and are for use only in the manner expressly permitted. MKS claims and reserves all rights and benefits afforded under law in the Programs provided by MKS.

MKS shall retain full ownership of Intellectual Property Rights in and to all development, process, align or assembly technologies developed and other derivative work that may be developed by MKS. Customer shall not challenge, or cause any third party to challenge, the rights of MKS.

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Customer shall protect the MKS Instruments, Inc. Programs and Related Materials as trade secrets of MKS and shall devote its best efforts to ensure that all its personnel protect the MKS Programs as trade secrets of MKS. Customer shall not at any time disclose MKS trade secrets to any other person, firm, organization, or employee that does not need (consistent with Customer's right of use hereunder) to obtain access to the MKS Programs and Related Materials. These restrictions shall not apply to information (1) generally known to the public or obtainable from public sources; (2) readily apparent from the keyboard operations, visual display, or output reports of the Programs; (3) previously in the possession of Customer or subsequently developed or acquired without reliance on the MKS Programs; or (4) approved by MKS for release without restriction.

SERVICE INFORMATION

The user should not attempt any maintenance or service of the present product and its accessories beyond the procedures outlined in this manual. Any problem that cannot be resolved should be referred to MKS l Newport. When calling MKS l Newport regarding a problem, please provide the Tech Support representative with the following information:

- Your contact information.
- System serial number or original order number.
- Description of problem.
- Environment in which the system is used.
- State of the system before the problem.
- Frequency and repeatability of problem.
- Can the product continue to operate with this problem?
- Can you identify anything that may have caused the problem?

NEWPORT CORPORATION RMA PROCEDURES

Any product being returned to MKS l Newport must have been assigned an RMA number by Newport. Assignment of the RMA requires the item serial number.

PACKAGING

Materials being returned under an RMA must be securely packaged for shipment. If possible, reuse the original factory packaging.

1 Safety Information

1.1 Safety Procedures and Precautions

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the instrument and may impair the protection provided by the equipment. MKS Instruments, Inc. assumes no liability for the customer's failure to comply with these requirements.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to an MKS l Newport Service Center for service and repair to ensure that all safety features are maintained.

SERVICE BY QUALIFIED PERSONNEL ONLY

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified service personnel only.

1.2 Symbols Used in This Instruction Manual

Definitions of, NOTE, CAUTION, WARNING and DANGER messages used throughout the manual.

NOTE	**The NOTE sign denotes important information. It calls attention to a procedure, practice, condition, or the like, which is essential to highlight.**
CAUTION	**The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of all or part of the product.**
WARNING	**The WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition, on the like, which, if not correctly performed or adhered to, could result in injury to personnel.**
DANGER	**The DANGER sign Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.**

1.3 Symbols Found on the Unit

The following are symbols that may be found on the unit.

1.3.1 European Union CE Mark

The presence of the CE Mark on Newport equipment means that it has been designed, tested and certified as complying with all applicable European Union (CE) regulations and recommendations.

1.3.2 United Kingdom Conformity Assessed Mark

The presence of the UKCA Mark on Newport equipment means that it has been designed, tested and certified as complying with all applicable United Kingdom's regulations and recommendations.

1.3.3 Waste Electrical and Electronic Equipment (WEEE) Mark

This symbol on the product or on its packaging indicates that this product must not be disposed with regular waste. Instead, it is the user responsibility to dispose of waste equipment according to the local laws. The separate collection and recycling of the waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For information about where the user can drop off the waste equipment for recycling, please contact your local MKS l Newport representative.

1.4 Cautions

CAUTION	**This product is a Class A device. In a residential environment, this device can cause electromagnetic interference. In this case, suitable measures must be taken by the user.**
CAUTION	**Do not exceed the usable depth indicated on the mounting holes (see section 2.7). Longer screws can damage the product or cause an electrical issue.**
CAUTION	**Do not place this product in a hostile environment such as X-Rays, hard UV, or in any vacuum environment.**
CAUTION	**Do not place this product in a location affected by dust, oil fumes, steam or high humidity or acidity. This may cause an electric issue.**
CAUTION	**Do not leave this product in places subject to extremely high temperatures or low temperatures.**
CAUTION	**Do not try to open this device. This may cause it to malfunction and will void your warranty**

2 Description

2.1 Introduction

This manual provides operating instructions for the ESP302-GPIB-ADPT that you have purchased.

ESP302-GPIB-ADPT

The ESP302-GPIB-ADPT is a "GPIB to Serial Adaptor" especially dedicated to connecting Newport ESP302 Motion Controller (equipped with a serial port) to a GPIB bus for users who want to drive it with an IEEE 488 interface.

2.2 Overview

The ESP302-GPIB-ADPT is controlled from the GPIB bus and transparently converts GPIB bus messages into serial data strings and returns data received on its serial port to the GPIB bus when addressed to talk. Figure below shows typical use and connections.

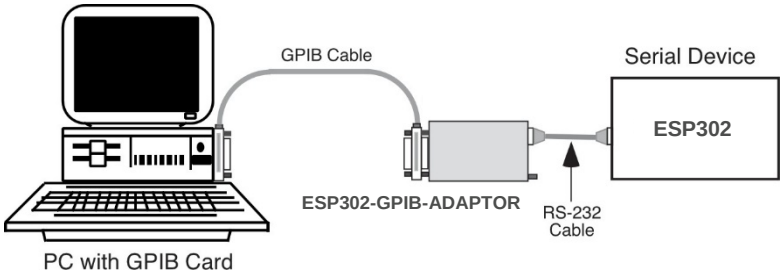

Figure 1: ESP302-GPIB-ADPT Connections

The ESP302-GPIB-ADPT has two operation modes: Data and Command.

- In the Data mode, data passes transparently through the unit in both directions from the GPIB bus to the serial interface. This mode is used to drive the ESP302 (see §**4.2**).
- In the Command mode, the ESP302-GPIB-ADPT operates as an IEEE-488.2 device and the GPIB controller can access its internal parser which includes the IEEE-488.2 Common Commands, the Status Reporting Structure and the SCPI configuration commands. This mode is used for GPIB port configuration only (see §**3.5**)

The ESP302-GPIB-ADPT powers up in the Data mode and switches to the Command mode when sent a GPIB Device Trigger (488.1 GET) command. Once in the Command mode, the unit will accept configuration parameters, respond to queries, and save new configuration settings but **not transfer serial data**. The unit must be put back into the Data mode with the SYST:OPER DATA command or by turning it off and back on before it can transfer serial data. Switching from Data to Command and back to Data without power cycling does not affect the data held in the serial receive buffer.

In the Data mode, messages from the GPIB bus are placed in the serial transmit buffer and outputted on the selected serial port. Serial characters are received in the serial receive buffer. When the ESP302-GPIB-ADPT senses it had received a message, it is moved to the GPIB output buffer, freeing the receive buffer for another message. If the ESP302-GPIB-ADPT is in the Command mode when it receives a serial message, the serial message is held in the serial receive buffer until the module is switched back to the Data mode.

Data flow on the ESP302-GPIB-ADPT's serial interface is always controlled by hardware handshake lines. The module uses its 'clear-to-send' output signal to allow the serial device to send it data. When the ESP302-GPIB-ADPT's serial receive buffer gets full, it drops its 'clear-to-send' output to stop the serial device from sending any more data until there is space in the input buffer.

The ESP302-GPIB-ADPT's transmitter is normally enabled all the time to hold the serial line in the mark (stop bit) state when it is not transmitting.

2.3 Protection of configuration parameters

All configuration parameters presented below are set in factory to match ESP302 features and are locked with a password. Only GPIB address can be changed according to user need.

2.4 IEEE 488 Interface

2.4.1 Address Range

Primary addresses: 1 – 30 (default: 4).

2.4.2 Data Buffers

GPIB input buffer - 4,096 bytes
Serial input buffer - 4,096 bytes

2.5 Serial Interface

The ESP302-GPIB-ADPT provides RS-232 signals on a rear panel DE-9P male connector. The choice of serial signals is selected by internal jumpers and factory settings. Signal pinouts are listed in Table 2.

2.5.1 Baud Rate

Baud rate 19200 baud.

2.5.2 Data Character Format

Data bits	8 data bits per character
Parity	None
Type	Asynchronous character
Stop bits	1 stop bits per character

2.5.3 RS-232 Specifications

The ESP302-GPIB-ADPT has single-ended RS-232C drivers and receivers and is designed to operate as a DTE device with up to 50 feet of cable.

Signals	Txd, RxD, RTS, CTS and Ground
Transmit Levels	> 6 Vdc = Logic "0" (Data '0') or Control signals On <-6 Vdc = Logic "1" (Data '1') or Control Signals Off
Receive	±1.5 Vdc minimum, ±25 Vdc Maximum

2.5.4 Flow Control

Large date transfers exceeding one buffer in length are handled by holding off data flow until the buffer is empty and then restarting the data flow. The ESP302-GPIB-ADPT uses Request-to-Send and Clear-to-Send signals to control the serial data flow. The signals are always enabled. Data flow is not controlled by X-on/X-off protocol.

2.5.5 Parity Generation/Checking

Transmitted characters are sent with no parity. Checking received characters for parity is not supported.

2.6 Indicators

The ESP302-GPIB-ADPT has six diagnostic LEDs that display the following conditions:

PWR	Indicates power on
RDY	Indicates unit has passed self-test
TLK	Indicates unit has recognized its talk address
LSTN	Indicates unit has recognized its listen address
SRQ	On when SRQ is asserted (Service request is not supported by ESP302)
ERR	Indicates an error has occurred

When the ESP302-GPIB-ADPT is turned on, it performs an internal self-test which takes about five seconds. During self-test the ESP302-GPIB-ADPT sequentially turns each LED on and off. It then shows its current GPIB device address by blinking the appropriate front panel LEDs for about 2 seconds. The LED bit weights are:

RDY	TLK	LSTN	SRQ	ERR
16	8	4	2	1

Figure 2: LEDs

Then, if self-test was successful, PWR and RDY LEDs should be on.

Otherwise, any errors found during self-test are indicated by a repeated blinking of the error code pattern. Refer to paragraph 6.1 for a description of the errors and their possible causes.

If the 5-volt reading is below 4.7 volts, the ESP302-GPIB-ADPT will repeat its power turn-on sequence until the voltage level reaches 4.8 volts or higher.

2.7 Physical characteristics

The ESP302-GPIB-ADPT is packaged in a small metal case that can be used on the bench top or panel mounted.

Table 1: Characteristics	
Size	6.11" L x 3.89" W x 1.13" H (15.52 cm L x 9.88 cm W x 2.87 cm H)
Weight	1 lbs. (0.45 kg.) including adapter
Temperature	Operating -10° C to +55° C Storage -20° C to +70° C
Humidity	0-90% RH without condensation
Shock/Vibration	Normal handling only
Construction	All metal case
Power	100-240 Vac @ 0.05 Ampere with power adapter
Connectors	IEEE 488 Interface: Amphenol 57-20240 female with metric studs RS-232 Interface: Cinch DE-9P with lock studs

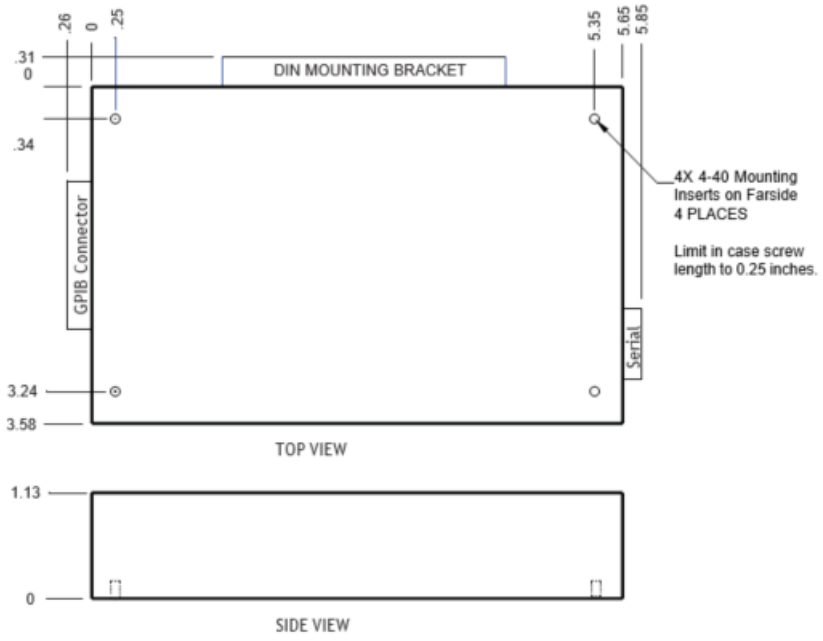

Figure 3: ESP302-GPIB-ADPT Outline Dimensions

3 Installation

3.1 Unpacking

The ESP302-GPIB-ADPT is delivered in packaging designed for safe transport. When unpacking, check the unit for signs of shipping damage (damaged box, scratches, dents, etc...) If the unit is damaged or fails to meet specifications, notify MKS l Newport representative immediately.

3.2 Shipment verification

3.2.1 Included accessories

The following items should be included with your unit:

- Universal AC/DC Power Adapter + 4 adaptation plugs
- Instruction Manual

3.2.2 Additional accessories

The following items should be provided separately:

- Special female SUB-D9 to male SUB-D15HD serial cable; possibly:
  - Newport ESP302-CAB-1.2 Serial cable 1.2-meter long or,
  - Newport ESP302-RS232 adaptor (+ standard serial 9P straight cable, not null modem).
- Standard GPIB cable

3.3 Mounting conditions

If the module is to be panel mounted, use the dimensions shown in Figure 3 to drill four mounting holes in the panel. Limit the screw length to 0.25 inches in the ESP302-GPIB-ADPT.

3.4 CONNECTIONS

3.4.1 GPIB Interface and Connector J2

The ESP302-GPIB-ADPT has a standard 24-pin, female GPIB connector with metric lock studs that accepts stacked and straight-in GPIB connectors. Use any GPIB cable to connect your GPIB controller to the ESP302-GPIB-ADPT.

Figure 4: GPIB connector J2

3.4.2 Serial Interface and Connector J1

The ESP302-GPIB-ADPT's serial port provides RS-232 single ended signals on a DE-9P male connector with lock studs.

Table below lists the RS-232 signals and their pin numbers.

Table 2: J1 RS-232 Signal-Pin Assignments

Pin	RS-232 Signal Name	Direction	Description
1	nc		no connection
2	BB	←	Receive Data in
3	BA	→	Transmit Data out
4	nc		no connection
5	AB		Ground
6	open		not used
7	CA	←	Request to Send in
8	CB	→	Clear to Send out
9	Power		Optional power input/output (not used)

Figure 5: RS-232 Serial connector J1

Use the special serial cable to connect the ESP302-GPIB-ADPT module to the ESP302 port. For custom cables check the cable connections to assure that the transmit data from the ESP302 pin 2 connects to the ESP302-GPIB-ADPT receive data input pin 2.

3.4.3 Power Connections

Use the supplied universal AC/DC power. The power adapter converts 100 to 240 VAC power to regulated 12 Vdc.

The ESP302-GPIB-ADPT's universal AC/DC Power Adapter ships with four plugs. Attach the appropriate plug for your country to the Power Adapter.

Plug the Universal AC/DC Power Adapter into an AC receptacle and into the power jack on the ESP302-GPIB-ADPT module. Verify the module passes its self-test as described in paragraph 2.6 and turn the power off.

Figure 6: PWR input

3.5 GPIB Port Configuration

When shipped, the ESP302-GPIB-ADPT is configured to operate as a GPIB-to-Serial controller and can be used directly to drive Newport ESP302 controller from a GPIB.

If necessary, only the ESP302-GPIB-ADPT GPIB address can be changed from the GPIB port. interface (if satisfied with default GPIB address 4, you can skip to section 4)

GPIB address configuration requires an interactive program that can:

- Send the IEEE-488.1 Device Trigger (GET) command to put the ESP302-GPIB-ADPT module into its Command mode.
- Send 488.2 Common Commands
- Send Standard Commands for Programmable Instruments (SCPI)

For instance, you can use NI Measurement & Automation Explorer (MAX) software and its VISA Test Panel or any other appropriate GPIB interactive program.

3.5.1 Preparation

- Turn the ESP302-GPIB-ADPT module off or disconnect if from its power adapter.
- Connect the ESP302-GPIB-ADPT to your GPIB Controller.

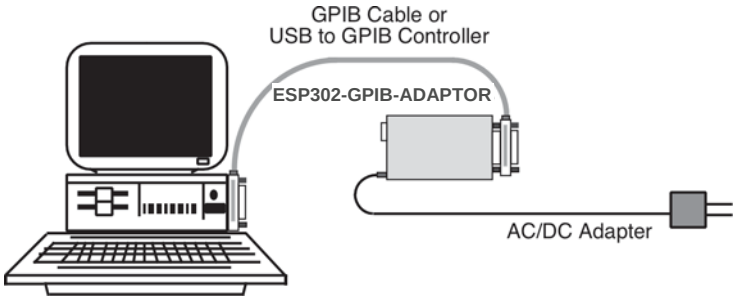

Figure 7: ESP302-GPIB-ADPT GPIB Port Connection

3.5.2 Starting communication

- Launch your usual interactive program and verify it found your GPIB Controller.
- Apply power to the ESP302-GPIB-ADPT module while watching the LEDs. After internal self-test (during which each LED sequentially turns on and off), it then shows its current GPIB device address by blinking the appropriate front panel LEDs for about 2 seconds. The LED bit weights are:

RDY	TALK	LSTN	SRQ	ERR
16	8	4	2	1

The LSTN LED should blink for new units which are factory set to GPIB address 4.

Then PWR and RDY LEDs should be on.

Figure 8: LEDs

- Set the ESP302-GPIB-ADPT's GPIB address in your interactive program.
- Send the 488.1 "GET" Trigger command to the ESP302-GPIB-ADPT module to switch to Command mode (Advanced menu / Triggers tab / Assert Trigger button in VISA Test Panel).
- Provide a short 30 millisecond pause after the Device Trigger before sending the unit a command or query.
- Send the 488.2 *IDN? query and read the IDN message to be sure you are talking to the ESP302-GPIB-ADPT:

  Write: ***IDN?**
  Read: **NEWPORT, ESP302-GPIB-ADPT, S/N 501001, rev x1** (example)

- If you do not get a response, power the ESP302-GPIB-ADPT off and repeat this sequence until you can read the IDN message.
- If the ESP302-GPIB-ADPT's red ERR LED comes on, send an *ESR? query to clear the error. The ESR query returns an error code that you can look up in Table 4 to see what was wrong with the command. Correct the command and resend it until you can do it without generating an error (commands should terminate by LF (10) and/or EOI asserted with last character).

3.5.3 GPIB address setting

- Send the following SCPI command to set a different GPIB address (5 for instance):

  Write: SYST:COMM:GPIB:ADDR 5

- To query the address setting, add a question mark, '?', to the SCPI command and send it to the ESP302-GPIB-ADPT module. The response should display the new address value:

  Write: SYST:COMM:GPIB:ADDR?
  Read: 5

- When done, send the ESP302-GPIB-ADPT the command to save the new configuration:

  Write: *SAV 0

- Wait 6 seconds and then power cycle the unit to apply new setting and come back to Data mode. In this example, LSTN and ERR LEDs should blink at power start-up to display address 5 (4+1).
- Coming back to Data mode is also possible (but without applying new setting) by sending the following command:

  Write: SYST:OPER DATA

- Set the new GPIB address in your interactive program.

4 Operation

4.1 Introduction

This section describes how the ESP302-GPIB-ADPT operates and transfers data when controlled from the GPIB bus.

NOTE	**To transfer data or commands to the ESP302, the ESP302-GPIB-ADPT must be in Data mode.**

4.2 Operation with the ESP302 controller

Once the ESP302-GPIB-ADPT is connected to a Newport ESP302 controller, and if in Data mode (which is the case upon start-up), user can send specific commands to the ESP302 (see ESP302 Programmer's Manual for list of appropriate commands) and read the response through his GPIB interactive software or program, taking care of the following:

- Messages sent to the ESP302 can terminate by LF (or CR+LF) and/or EOI asserted
- Responses from the ESP302 terminate by CR+CR+LF and EOI asserted

To check correct communication with ESP302, send the motion controller command to query the firmware version and verify you get the response:

Write: **VE?**
Read: **ESP302 Snapshot version N200018-prel2** (example)

Then, for example, to move axis 1 in absolute position 10:

Write: **1PA10**

Or to get axis 3 absolute position:

Write: **3PA?**
Read: **5**

If an unknown command is sent to the ESP302, it will be ignored, and a command error will be logged in the ESP302. However, a new command can be sent and interpreted immediately.

If the response buffer is read when empty (after an improper query for instance), it will generate a timeout error. A new read operation can be conducted once a response is supposed to be available.

4.3 Important note to former ESP301 controller users

Users who would like to replace their former ESP301 controller GPIB driven application by an ESP302 + ESP302-GPIB-ADPT must be aware of the following:

- As mentioned above, messages sent to the ESP302 must terminate by LF (and/or EOI asserted) instead of CR.
- As mentioned above, ESP302 messages terminate by CR+CR+LF instead of CR+LF.
- ESP301 "SA" command should be replaced by the previously described procedure to set the GPIB address. Basically, the GPIB address is set in the ESP302-GPIB-ADPT and not in the ESP302.
- ESP301 "RQ" command is accepted by the ESP302 but has no effect since no service request can be processed through the serial line.

5 Maintenance

5.1 Maintenance

The ESP302-GPIB-ADPT does not require periodic calibration and has no internal adjustments. However, if it is used in an application where the IEEE-488 bus cables are frequently changed, the ESP302-GPIB-ADPT's IEEE-488 Bus Connector may occasionally require cleaning to remove wax and dirt buildup. New bus connectors are sometimes shipped with a brightener (thin wax like film) on them. Depending upon usage, enough of the brightener may buildup on the ESP302-GPIB-ADPT's bus connector to cause intermittent operation.

The brightener is an organic compound and may be cleaned off by washing the connector with a mild detergent solution followed by an alcohol wash.

5.2 Troubleshooting

Table below lists several common fault indications and suggests actions that can be done to either clear the fault or isolate the problem to a faulty piece of equipment.

Troubleshooting guide		
Symptom	**Possible Fault**	**Action or Check**
Unit will not turn on	Power cord not plugged in Power at AC outlet Adaptor polarity	Push power cord into DC receptacle Check outlet and power adapter Unit requires + polarity center pin
Unit shows blinking LEDs	Self-test fault	Refer to Self-Test errors in Table 3
Unit does not respond to commands	Unit received an invalid command	Search host program for command error. Check ERR Led and query the ESR Register if the ERR Led is on

5.3 Repair

CAUTION **Never attempt to open the ESP302-GPIB-ADPT cover.**

If you observe a malfunction in your adapter, please contact us immediately to arrange for a repair.

CAUTION **Any attempt to open or repair a ESP302-GPIB-ADPT without prior authorization will void your warranty.**

6 Appendix

6.1 Self-Test Error Codes

At power turn on, the ESP302-GPIB-ADPT conducts a self-test of its major components. A successful test ends when the RDY LED on. Test failures are indicated by the LED patterns shown in Table below. Typically, the failure is a pattern of blinking LEDs which lasts for 5 seconds. If the ESP302-GPIB-ADPT does not have a fatal error, the self-test will continue until it is complete but the RDY LED will remain off. If a self-test failure occurs, turn the unit off for 10 seconds and turn power back on. If the failure persists, refer to paragraph 5.3 for repair instructions.

Table below lists the ESP302-GPIB-ADPT self-test error codes and most probable faulty component.

Table 3: ESP302-GPIB-ADPT Self-Test Error Codes

Front Panel LED							Fault
Resp.	PWR	RDY	TLK	LSTN	SQR	ERR	
-	⊕	-	-	-	-	-	fatal error (CPU, Flash RAM …etc.)
-	-	-	-	-	-	-	fatal error (power supply)
-	⊕	⊕	⊕	⊕	⊕	⊕	fatal error (CPU, Flash RAM …etc.)
4	⊕	-	-	B	-	-	7210-U13
0	⊕	⊕	x	x	-	-	Self-test passed successfully

LED legend: ⊕ led is on
- led is off
B led is blinking
x led could be on or off

6.2 ERR LED Error codes

In Command mode, if the ERR LED turns on, the *ESR query returns a number representing the sum of the different bits set in the Event Status Register. For example, if the response is 160, it means events of bit 7 (weight: 128) and bit 4 (weight: 32) have occurred.

Table 4: ESR Bit definitions

Bit	Weight	Event	Description
7	128	PON	The Power-on event occurs at power turn-on and can be used to signal a power off-on occurrence.
6	64	SRQ	GPIB SRQ line asserted.
5	32	Cmd	Command Error. Command not executed due to bad or invalid command, spelling or syntax.
4	16	Exc	Execution Error. Values out of range etc. Command not executed.
3	8	Memory	Setup variable data corrupted.
2	4	Query	Query error, data not read or read attempted with no datapresent.
1	2	Timeout	GPIB Bus timeout.
0	1	OPC	Operation Complete. Operation Complete has no meaning in the Adaptor and is always 0.

Service Form

Your Local Representative

Tel.:

Fax:

Name:_____ Return authorization #: _____
(Please obtain prior to return of item)

Company:_____

Address:_____ Date: _____

Country: _____ Phone Number:_____

P.O. Number: _____ Fax Number: _____

Item(s) Being Returned: _____

Model#: _____ Serial #:_____

Description: _____

Reasons of return of goods (please list any specific problems): _____

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