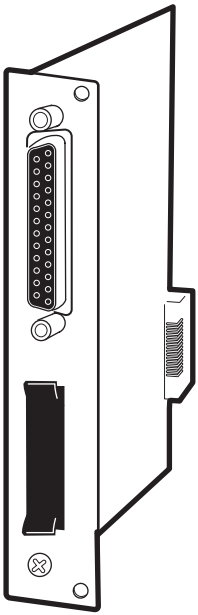
Part No. Z1-000-372, IA002264
Feb. 2007

OPERATION MANUAL

RS-232C INTERFACE

RS11



KIKUSUI

Use of Operation Manual

Please read through and understand this Operation Manual before operating the product. After reading, always keep the manual nearby so that you may refer to it as needed. When moving the product to another location, be sure to bring the manual as well.

If you find any incorrectly arranged or missing pages in this manual, they will be replaced. If the manual gets lost or soiled, a new copy can be provided for a fee. In either case, please contact Kikusui distributor/agent, and provide the “Kikusui Part No.” given on cover.

This manual has been prepared with the utmost care; however, if you have any questions, or note any errors or omissions, please contact Kikusui distributor/agent.

◆ Receiving Inspection

Upon receipt of the RS-232C interface, please immediately inspect it to check that it has not been damaged when in transportation. Also check that the accessories are not missing.

◆ Accessories

The following accessories accompany the RS-232C interface.

- Dummy socket for MCB connector ..... 1 (installed)
- Installation bolts 2
- Operation manual ..... 1 copy

Caution

- Do not touch the electrically conductive parts of theRS11 interface.
  If you do, internal electronic parts can be damaged by static electricity.

Keep this manual near the RS-232C interface so that you can refer to this manual whenever you want to.

TABLE OF CONTENTS

Chapter 1. GENERAL

1.1 Introduction

The RS11 is an RS-232C interface board for communications with an applicable model of Kikusui DC Power Supply or Electronic Load.
Also, the RS-232C has functions as a master device of a Multi-channel Bus (MCB) for system expansion. As used in conjunction with an MCB board, the RS11 allows you to configure a system comprised of a multiple number of applicable models of DC Power Supplies or Electronic Loads. (The MCB Interface Board, Model MC11S, is optional.)
Before start using these instruments, read this manual and that of the instrument on which the RS11 is to be installed for communication.

Caution

- In the text of this manual, term "RS11" denotes Model RS11, RS-232C Interface and term "main instrument" denotes the Power Supply or Electronic Load an which the RS11 is be installed.

1.2 Applicable Series

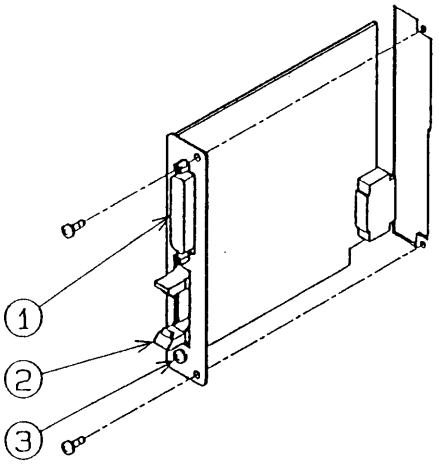
The RS11 is applicable to the following series of instruments:

1) PAX Series
2) PBX Series
3) PLZ-3W Series
4) PAD-LET Series
5) Other instruments as specified elsewhere

Chapter 2. PREPARATION

2.1 Installing the RS11

Insert the RS11 into the interface board slot of the main instrument and fix the RS11 to the main instrument with the two installation bolts.



WARNINGS

- Before installing the RS11 on the main instrument, be sure to turn-off the POWER switch of the main instrument and disconnect its AC power cable from the AC line.
- Do not touch the electrically conductive parts of the RS11. If you do this, internal electronic parts can be damaged by static electricity.

Caution

- Be sure to install the RS11 in the correct direction as illustrated above.
- For the location of the interface board slot of the main instrument, refer to the operation manual of the main instrument.

2.2 Description of Connectors and Terminal

① RS-232C connector : A 25-pin connector based on EIA RS-232C Standard. For connection, securely insert the connector of the RS-232C cable and fixit with the screws.

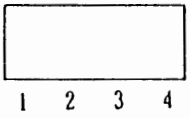
② MCB connector (for masterunit) : A connector for MCB (Multi-channe Bus), to beconnected to the MCB IN connector of MCB interface board(MC11S). For connection, securely insert the connector of the dedicated cable and fix it with the lever.

(NOTE) • When connecting the cable, remove the dummy socket.

③ Frame ground terminal : This terminal is connected to the casing of the main instrument.

2.3 Setting the Short Plugs (S3)

Set all Short plugs (S3) of the RS11 to the "open" state. For the location of the Short plugs, refer to Appendix "External Views and Overall Dimensions" at the end of this manual.



(Caution)

• Do not set the Short plugs to other than "open." If you do this, the IB11 may not operate properly. (The factory default is "open" for all Short plugs.)

Chapter 3. STARTUP AND TEST

3.1 Turning-on Power

After correctly installing the RS11, turn-on power of the main instrumet and check the sign-on display on the main instrument. The sign-on display may differ depending on the model of the main instrument, but will indicate installation of the RS11 as shown below for example--where the main instrument is PAX35-20 Power Supply.

```
PAX 35-20        Ver1.00
RS96
```

- Message "RS96" on the bottom row means that the RS11 is installed. Argument "96" denotes the data transmission rate--9600 bps.
- For further details, refer to the operation manual of the main instrument.

3.2 Running a Test Program

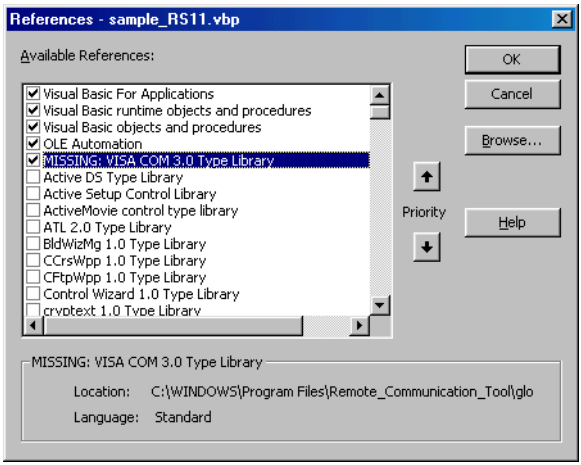
The sample program to be described later assumes Microsoft Visual Basic 6.0 for the development platform and VISA library (VISA COM) for the I/O library.

You can use the following either VISA libraries.

- Kikusui Corp.: KI-VISA
  (VER.3.0.x or later,
  Downloadable from http://www.kikusui.co.jp/en/download/)
- National Instruments: NI-VISA
  (VER.3.0 or later, Windows 2000 and Windows XP: VER.3.2 or later)
- Agilent Technologies: Agilent VISA
  (Agilent IO Libraries M.01.00 or later)

NOTE

- Check VISA COM 3.0 Type Library in the project setting dialogue.
- Make the command button of an object name of “sample” in FORM.



Sample Program

```
Private Sub sample_click()
    '*******************************************************
    '* Communication IO open module
    '* Communication port is fixed as follows.
    '* RS232C port: COM 1
    '*
    '* Substitute a RS232C port number for strVisaAddress.
    '* This sample program open the communication port and send IDN?.
    '* The quiry result is stored in strIDN variable.
    '*
    '*******************************************************

    ' The acquisition and communication setting of  VISA session
    Dim rm As VisaComLib.IResourceManager
    Dim io As VisaComLib.IMessage
    Dim serial As VisaComLib.ISerial
    Dim strVisaAddress As String    ' strVisaAddress variable specifies VISA address.

    strVisaAddress = "ASRL1::INSTR"           ' RS232C port COM 1 setting

    ' Make a resource manager object.
    ' (First try making the object with VISA Global resource manager.
    ' If you fail, try making the object with Agilent resource manager.)

    On Error Resume Next
    Set rm = CreateObject("VISA.GlobalRM")
    If rm Is Nothing Then
           Set rm = CreateObject("AgilentRM.SRMCls")
    End If
```

```
    On Error GoTo 0

    ' VISA session opening
    Set io = rm.Open(strVisaAddress, NO_LOCK)

    ' RS232C communication protocol is set.
    If io.HardwareInterfaceType = INTF_ASRL Then     ' When IO resource is RS232C,
                                                     ' the following setting is carried out.
           Set serial = io                           ' RS232C
           serial.BaudRate = 9600                    ' Baud rate, 9600 bps
           serial.DataBits = 8                       ' Data bit, 8 bits
           serial.StopBits = ASRL_STOP_ONE           ' Stop bit, 1 bit
           serial.Parity = ASRL_PAR_NONE             ' Parity bit, None
           serial.FlowControl = ASRL_FLOW_XON_XOFF   ' Flow control, Xon/off
           serial.Timeout = 5000                     ' Time out, 5 sec (When it is not set,
           End If                                    ' default setting is 2 sec.)

    ' ID inquiry
    On Error Resume Next
    io.WriteString "IDN?" + vbCrL      ' ID query command +CRLF transmission
    Dim strIDN As String
    strIDN = io.ReadString(256)        ' Assign the received data to a strIDN variable.

    '*****************************************************
    '* Communication IO close
    '*****************************************************

    ' Close the VISA session
    If rm Is Nothing Then Exit Sub
    io.Close
End Sub
```

Chapter 4. CHECKUP BEFORE ORDERING REPAIR

When the RS11 or the main instrument has become failed seemingly, check it as described in this section in order to make certain that its has actually failed.

Checkup Procedure

Symptoms	Items to be checked	Remedies
The sign-on display does not indicate the installation of RS11.	Installation of the RS11	Correctly install the RS11.
The program message is not receivde or accepted by the main instrument.	RS-232C cable	Correctly connect the RS-232C cable.
	Wrong setting of transmission rate or other parameter.	Correctly set the parameter.
	Syntactical error of command	Correct the command syntax.
No program message is returned from the main instrument.	Wrong setting of transmission rate or other parameter.	Correctly set the parameter.
	Wrong setting of terminator (delimiter)	Correctly set the terminator (delimiter).
	Syntactical error	Correct the syntax of the query.

Check the following once more:

- Do the data transmission rate and other communication parameters of the RS11 conform with those of the terminal?
- Is not the RS-232C cable connection correct? Is the cable type(cross cable or straight cable) correct?
- Have not you sent a command which is inhibited for the operationmode of the main instrument?

◎ If the RS11 does not operate properly even after you have checked and corrected the above items, order your Kikusui agent for repair.

Chapter 5. SPECIFICATIONS

5.1 RS-232C Section

5.1.1 Applicable Interface Standard

EIA RS-232C Standard

5.1.2 Connectors

Type: 25-pin D-SUB receptacles

Pin assignment (DTE connections)

Pin	Signal	Description	
1	FG	Frame ground	
2	TXD	Transmitted data	
3	RXD	Received data	
4	RTS	Request to transmit	
5	CTS	Consent to transmit	
6	DSR	Data select ready	(NC)
7	SG	Signal ground	
8	CD	Carrier detect	(NC)
20	DTR	Data terminal ready	("Hi")

5.1.3 Communication Protocols

1) Sync. system : Asynchronous
2) Flow control : Xon/Xoff
3) Transmission rate : 9600/4800/2400/1200 bps
4) Data bit size : 7/8 bits
5) Stop bit size : 1/1.5/2 bits
6) Parity bit : None/odd/even

(NOTE) • For the setting method of communication parameters, refer to the operation manual of the main instrument.

5.2 MCB (Master Function) Section

5.2.1 Serial Communications

1) Between master and slave: Synchronized full-duplex, 9600 bps
2) Address designation system
3) ACK control system
4) Balanced transmission system
5) ASCII: 8 bits

5.2.2 Control Lines

1) Non-balanced transmission system

5.2.3 Connectors (MCB Connector)

1) Model: XG4A-1434 of OMRON Corp. (or equivalent)
2) Pin assignment

Pin	Signal	Function
1	TXD−	"−" line of signal transmitted from master
2	TXD+	"+" line of signal transmitted from master
3	RXD−	"−" line of signal received to master
4	RXD+	"+" line of signal received to master
5	GND	Logic ground
6	CLK−	"−" line of clock signal for sync.
7	CLK+	"+" line of clock signal for sync.
8	GND	Logic ground
9	TLKRQ	Talk request signal (negative logic)
10	TLKAK	Talk acknowledge signal (negative logic)
11	TRG	Trigger control signal (negative logic)
12	NRDY	Global address response signal (negative logic)
13	CABLE	Cable connection signal (negative logic)
14	GND	Logic ground

5.2.4 Cables

1) Type of connectors : XG4M-1434 of OMRON Corp. (or equivalent)
2) Type of cables : BIOS cable of BANTO DENSEN Corp. (or equivalent)
3) Number of units : Up to 15 slave units per 1 master unit
4) Cable length : Up to 30 meters. (As a standard accessory, a 1-meter-long cable accompanies the MC11S.)

5.2.5 Interface Functions

1) Data send/receive function (synchronized serial full-duplex communication)
2) Simultaneous trigger function
3) Protection synchronization function
4) Others

(NOTE) • For these functions, refer to the operation manual of the main instrument.

5.2.6 Others

Master MCB address: 0 (fixed)

5.3 Ambient Conditions (when installed on main instrument)

Operable temperature	: 0 to 50℃
Operable humidity	: 10 to 90% RH
Storage temperature	: −20 to 70℃
Storage humidity	: 10 to 90% RH

5.4 Withstanding Voltage and Insulation Resistances

1) Withstanding voltage

Output - main instrument : 1500 V AC, 1 minute

2) Insulation resistances

Output - chassis	: ≧ 30 MΩ, at 500 V DC
Main instrument - chassis	: ≧ 30 MΩ, at 500 V DC

• In the above, term "output" denotes the RS-232C or other interface side of RS11 and term "main instrument" denotes he main instrument side of RS11.

5.5 Dimensions and Weight

Dimensions : As shown in Appendix "External Views and Overall Dimensions."

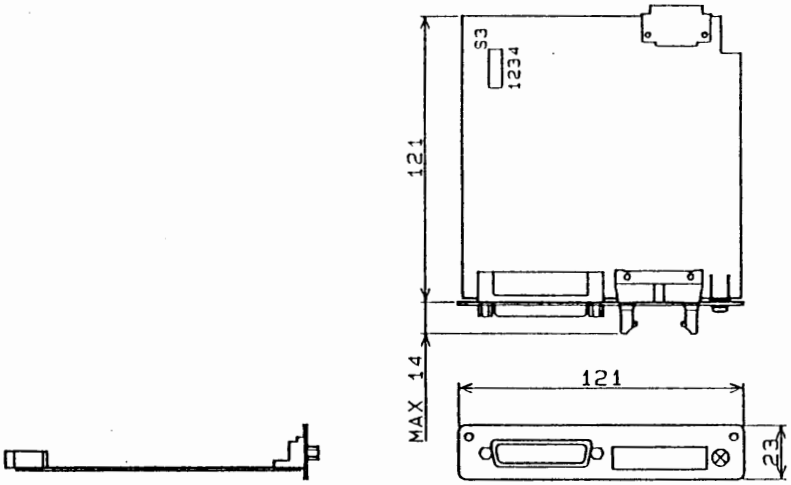
Weight : Approx. 150 g

5.6 Accessories

Dummy socket for MCB connector	1 (installed)
Installation bolts	2
operation manual	1 copy

Appendix: EXTERNAL VIEWS AND OVERALL DIMENSIONS

[UNIT:mm]



RS11