User manual

InterBus-S slave module

Version 9810:1.02

HITACHI

Table of Contents

1. General INTERBUS-S information

This section contains a short technical and functional description of the INTERBUS-S standard. For a more detailed description please consult the INTERBUS-S specification.

INTERBUS-S topology

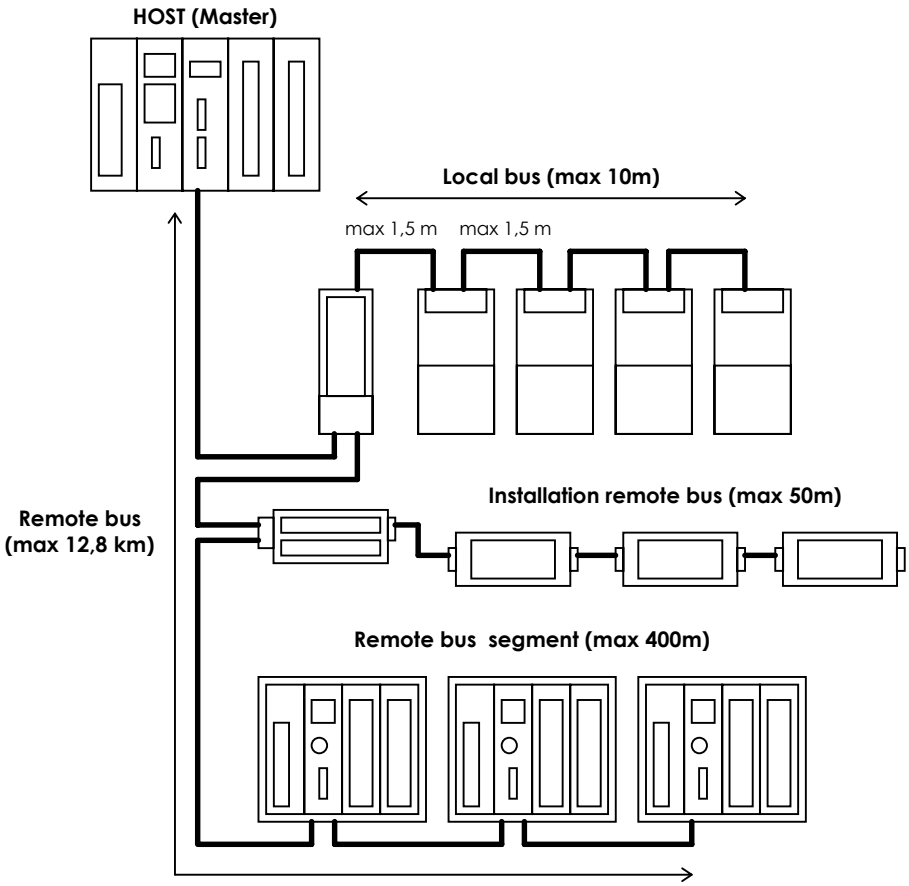


Figure 1 INTERBUS-S topology

Basic INTERBUS-S remote bus specification

General

The remote bus bridges the large distances within a system. The entire remote bus can be up to 12,8 km in length (from the host to the last connected remote bus module). This is achieved by dividing the whole remote bus into individual segments.

A remote bus segment consists of the transmission line (remote bus cable), and the bus module connected to it. A remote bus segment can bridge up to 400 m. The complete remote bus can thus be subdivided into 256 remote bus segments.

Basic remote bus specification

Max. length of remote bus segment:	400 m
Max. bus cable length between:	
- Host and first remote bus module	400 m
- two remote bus modules	400 m
- Host and last remote bus module	12,8 km
Transmission rate:	500 kbits/s
Transmission medium:	RS-485

The scan time of the INTERBUS-S system depends on the various factors and increases almost linearly with an increasing number of I/O points. However, due to the efficiency of the INTERBUS-S protocol, it is predominantly determined by the number of I/O points.

2. Technical specification

Features

- / ***INTERBUS-S remote bus compatible***
- / ***Fast update time (32 units with 2048 I/O points are updated in 7,2 ms)***
- / ***Easy to install and configure***
- / ***Can be used in two different modes.***
  1. Link mode (operates like a link unit)
  2. Remote mode (operates like a remote unit)

General description

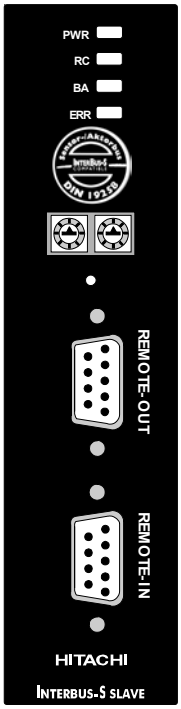
The Hitachi INTERBUS-S slave module, named IBSS, is designed to operate as a slave unit of remote bus type on an INTERBUS-S network. The IBSS module can be configured in two different modes of operation, Link Mode and Remote Mode. The mode is selected by a DIL-switch on the module. See the following pages for detailed explanation of each mode.

For the programmer the IBSS module acts like a normal I/O module when it is configured in Link mode, and as a normal remote module when it is configured in Remote mode

The IBSS module is easy to use and to configure. The front panel with LED (Light Emitting Doide) indications gives the user a good overview of the module status.

IBSS front panel

The IBSS front panel contains all INTERBUS-S indications and most of the common used setup features. See the following pages for more information concerning setup and indications.



PWR Power indication
RC: Remote bus Check
BA: Bus Active
ERR ERROR indication

Rotary switches
Slot configuration

Reconfiguration button

Bus connector
Remote bus out
9-pol female D-SUB

Bus connector
Remote bus in
9-pol male D-SUB

Figure 2 IBSS front panel

I/O Link Mode

In I/O Link mode the IBSS module works like a I/O unit in a base with a CPU. The IBSS module receives 4 words of input data (64 bits) and transmits simultaneously 4 words of output data (64 bits) over the INTERBUS-S network. The number of received and transmitted I/O words can not be changed.

The CPU can access the IBSS module as a normal word module with 4 input words and 4 output words. Configure IBSS with " W IO 4/4W ". WX00x0 - WX00x3 and WY00x4 - WY00x7. (x = depends on slot No).
* The IBSS module shall be mounted close as possible to the CPU.

The IBSS module works together with H200, H250 and H252 CPU units from Hitachi. The base can be a BSM or BSH type.

Several IBSS modules can be installed in the same base.

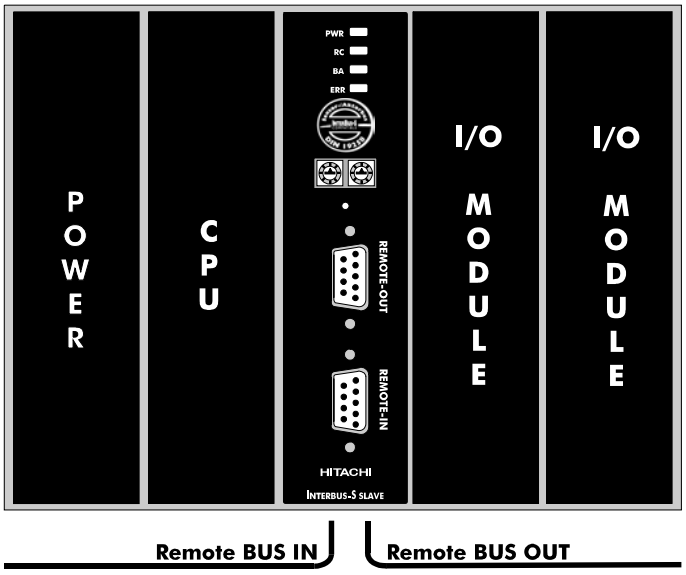


Figure 3 Link mode configuration

Remote Mode

In Remote mode, the IBSS module operates like a remote unit in a base without a CPU. IBSS receive 0-4 words of data (0-64 bits) and simultaneously transmits 0-4 words of data over the INTERBUS-S network.
The IBSS module also transfers data to and from standard Hitachi I/O modules in the base. The base can only be a BSM type.

- The Input modules are always installed closest to the IBSS. The number of input modules (0-4) are selected by rotary switches on the front of the IBSS module (see section 3).

- The output modules are always installed after the input modules. The number of output modules (0-4) are selected by rotary switches on the front of the IBSS module (see section 3).

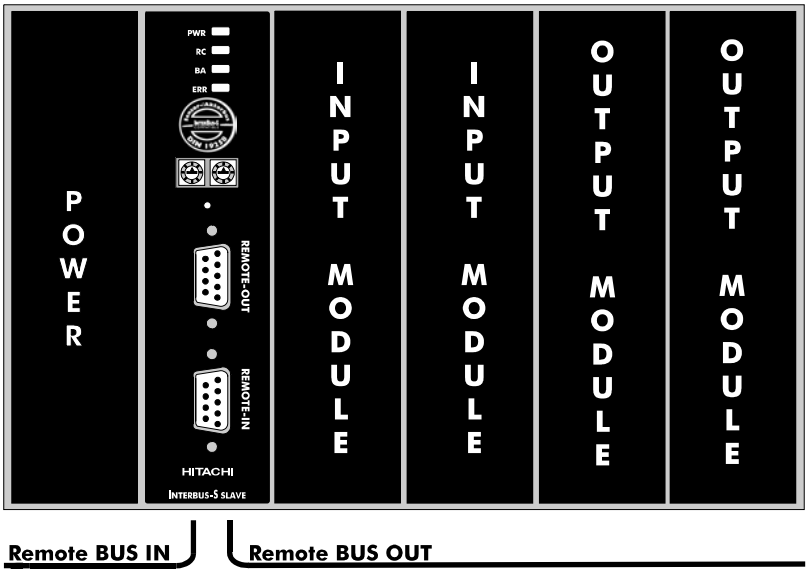


Figure 4 Remote mode configuration

3. Installation and configuration

Hardware configuration

The IBSS hardware configuration is done with a 4-pol DIP switch. The DIP switch is located on the IBSS circuit board according fig 5 below.

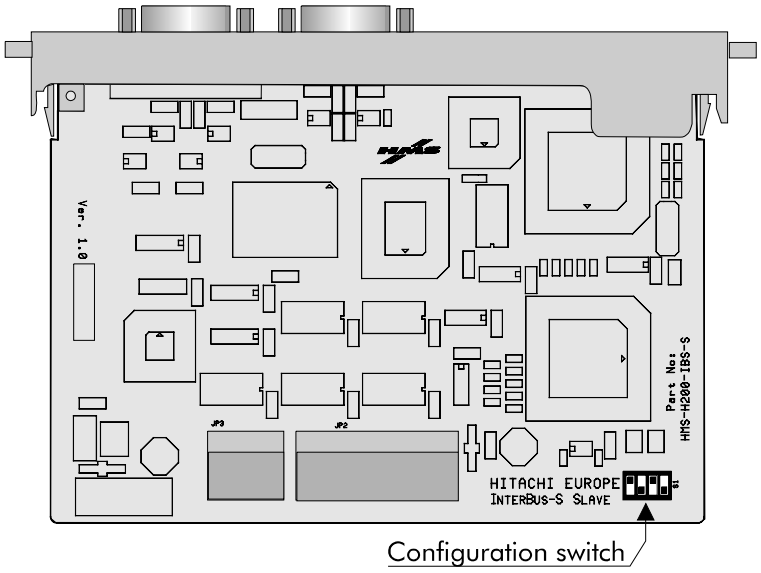


Figure 5 IBSS circuit board

Note The configuration switch is mounted upside-down on the circuit board.

The DIP-switch controls the following functions:

Example:
Link mode
Output hold = OFF

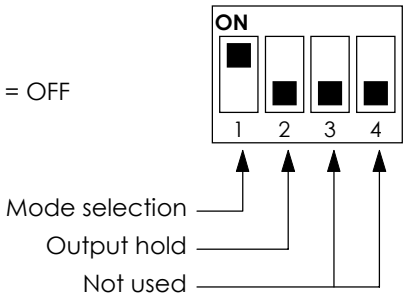


Figure 6 IBSS configuration switch (top view)

Mode selection

The IBSS operation mode is controlled by bit 1 on the configuration switch (see fig. 6).

The IBSS module will operate in:
- Link mode when switch 1 is in ON position
- Remote mode when switch 1 is in OFF position

Output hold

The output hold functions freezes the output values of the module when a INTERBUS-S network ERROR occurs. If the output hold function is disabled the output values will be set to zero if a INTERBUS-S network ERROR occurs. The output hold function is valid in both Remote mode and Link mode operation.

The output hold configuration is controlled by bit 2 on the configuration switch (see fig. 6). The IBSS module will operate with:

- enabled Output hold function when switch 2 is in ON position

- disabled Output hold function when switch 2 is in OFF position

Slot selection

When the IBSS module is configured in Remote mode the module handles the updating of data to and from standard Hitachi I/O modules installed in the BSM base.

The number of input modules (0-4) and output modules (0-4) mounted in the base are selected by rotary switches on the front of the IBSS module according fig. 7.

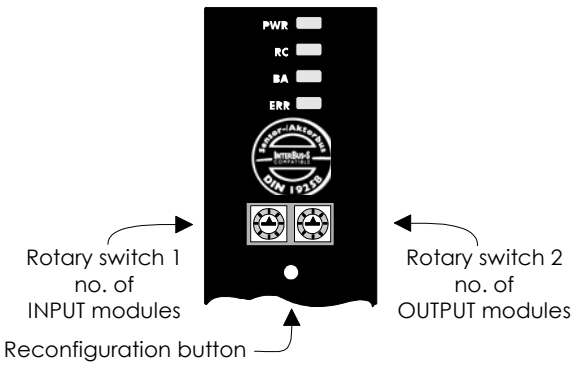


Figure 7 IBSS front panel configuration

The IBSS module reads the rotary switch settings:

- When the system is powered up
- when the reconfiguration button is pressed and the INTERBUS-S network is inactive.

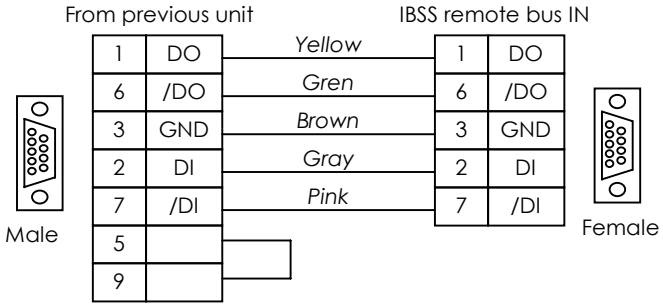
Note. The input modules have to be mounted closest to the IBSS module in the base.

INTERBUS-S remote bus cable

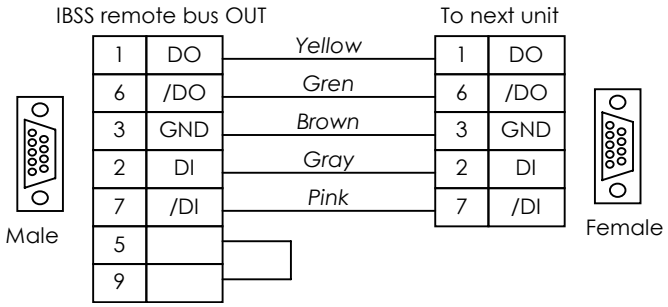
The INTERBUS-S network cables are connected to the IBSS module on the two 9-pol D-SUB connectors on the front of the module. There is one connector for remote bus IN (from the previous INTERBUS-S unit) and one connector for remote bus out (to the next INTERBUS-S unit).

The pin layout of the connectors follow the INTERBUS-S standard. The bus cable shield should be connected to the D-SUB housing in both ends of the cable.

INTERBUS-S network cable to IBSS module:



INTERBUS-S network cable from IBSS module:



If the IBSS module is the last unit in the INTERBUS-S network the remote bus out connector is not used.

4. Indications

The IBSS module status and INTERBUS-S network status is indicated with four LED's on the front panel.

Led	Name	Function
PWR	Power indication	Lit when the IBSS module is operating normally, otherwise turned off.
RC	Remote bus Check	Lit when the input cable is connected, otherwise turned off.
BA	Bus Active	Lit when the INTERBUS-S is running, otherwise turned off.
ERR	ERROR indication	Lit when a INTERBUS-S ERROR has been detected, when the INTERBUS-S is restarted it is turned off.

5. Troubleshooting

Common ERROR description

1	The IBSS module is not working and the PWR LED is not lit.	A	Check if the base has the correct power supply.
		B	Check if the IBSS module is correctly inserted in the base.
2	INTERBUS-S ERROR	A	Check if all units in the INTERBUS-S network has power supply.
		B	Check the INTERBUS-S BUS cable
3	The INTERBUS-S network is running but the base is not updated correctly.	A	Check if the IBSS module is correctly inserted in the base
		B	Check if the IBSS module is configured in the correct mode (see section 3)

Common ERROR description remote mode

1	The base is not updated correctly.	A	Check if the slot selection (rotary switches on the front panel) is correct.
		B	Check if the IBSS module is correctly inserted in the base.
		C	Check if the I/O modules is correctly inserted in the base
		D	Only 16-bit modules can be used.
		E	Check if the IBSS module is configured in the correct

			mode (see section 3)