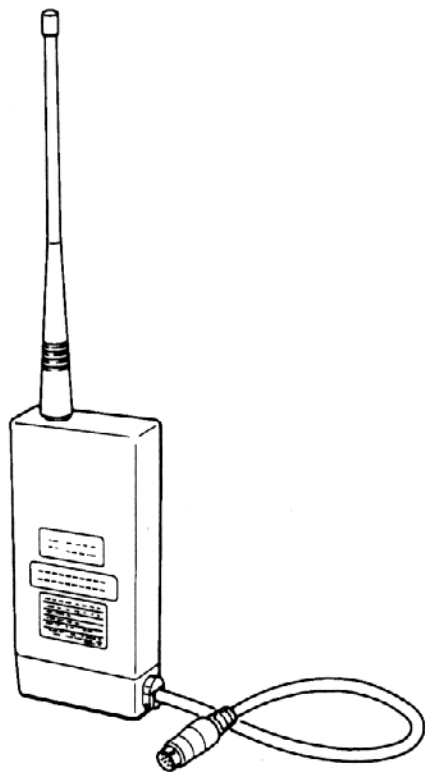


Telemetry Transmitter Module

HLX-501

Operation Manual



CE

- Read this manual prior to use of the HLX-501.
- Store this operation manual in an easily accessible place near the unit for future reference.



This device bears the CE label in accordance with the provisions of Medical Device Directive 93/42/EEC.

THE PERSONS RESPONSIBLE FOR PLACING DEVICES ON THE EC MARKET UNDER MDD 93/42/EEC

NAME : FUKUDA DENSHI UK

ADDRESS : 13 WESTMINSTER COURT, HIPLEY
STREET OLD WOKING, SURREY GU22 9LG,
U.K.

 **CAUTION**

Federal law restricts this device to sale by or on the order of a physician.

NOTE : Only a physician or a person under the guidance of a physician can use this device.

Copyright © 1998 by Fukuda Denshi Co., Ltd.

No part of this document may be copied or transmitted in any form without the prior written permission of Fukuda Denshi Co.,Ltd.

Printed in Japan

Contents

Telemetry Precautions	I
Safety Information and Messages	II
Safety Considerations in Using Medical Electrical Equipment	III
1. General Description	1
2. Controls and Indicators	2
3. Mounting the HLX-501 to the Bedside Monitor 【Mounting into DS-5100】	4
【Mounting into DS-5300】	7
4. Setting and Labeling the Frequency Channel and Group Number	10
5. Setting the Receiving Channel of the Monitor	20
6. Cleaning, Sterilization and Disinfection	21
7. Maintenance and Inspection	22
8. Specifications	24
9. Accessories	26

Telemetry Precautions

For proper management of the telemetry installation, consult your Fukuda Denshi representative concerning the following:

- Plan the installation of your telemetry system taking into account your entire medical facility needs and plant requirements.
- Be sure the antenna system installed meets the facility and plant requirements.

WARNING

This Radio Frequency device is susceptible interference from Television station and other outside sources. Interference may prevent the monitoring of patients connected to this devices. If problems exist contact your local service representative.

NOTE : This device operates in the 400MHz UHF band. The exact frequency of operation depends on designation, has been present for your facility and may be identified by cross-referencing the channel designator on the device with the Telemetry Channel-Frequency Table in this manual.

To assure safe and reliable operation, observe the following precautions:

- Be sure that no other devices are using the frequency assigned to this transmitter.
- This device is susceptible to interference from electrosurgical knives and other computerized equipment. If problems occur contact your local Fukuda Denshi service representative.
- Any obstruction such as reinforced concrete or large metallic surfaces between the receiver and the transmitter can affect reception. If problems occur contact your local Fukuda Denshi service representative.
- When the low battery alarm is present replace the battery.

CAUTION

Users are advised to periodically contact the FCC and local TV station to determine television transmission and other transmitter frequencies that may be used in their geographic area.

1. General Description

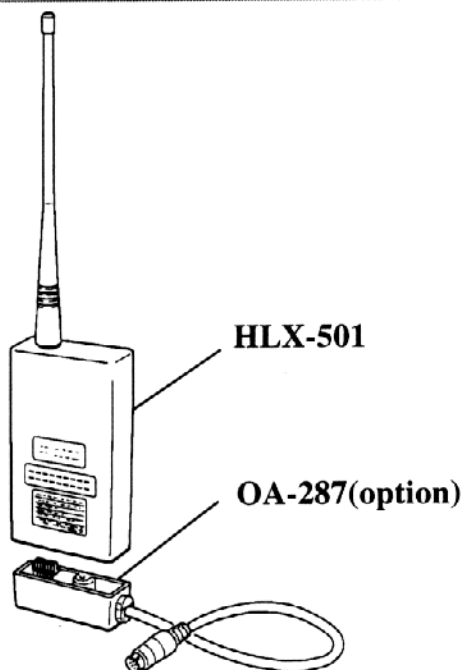
The HLX-501 is a telemetry transmission module to transmit physiological parameters monitored by a bedside monitor in the DS-5000 series via wireless technology. Thus, the HLX-501 allows the user to configure an integrated telemetry patient monitoring system in combination with a central telemetry receiver and central monitor such as the DS-5800N.

Since the telemetry transmitter uses a synthesizing method, the user can designate a desired channel through the bedside monitor. The HLX-501 is programmed through software transferred from an IC card installed in the bedside monitor.

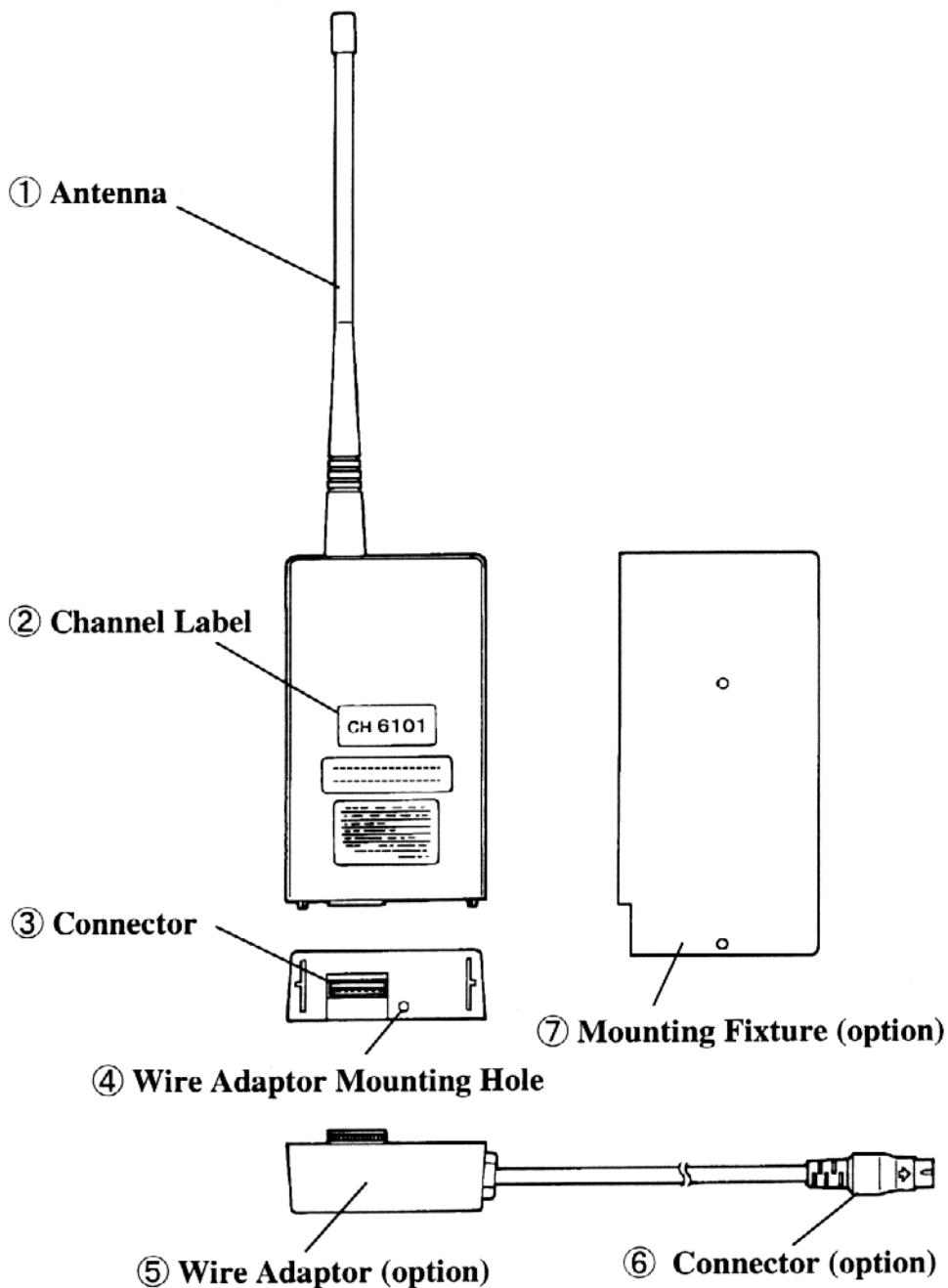
For compatibility with monitors other than DS-5000 series, contact your Fukuda Denshi representative.

NOTE: Depending on the country of destination, the telemetry channel select function as described in this manual, may not appear on the monitor due to regulations governed by the country for wireless transmission.

External Appearance



2. Controls and Indicators



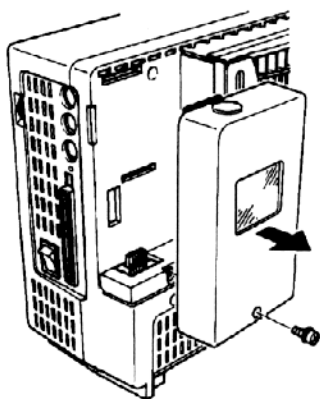
3. Mounting the HLX-501 to the Bedside Monitor

Described here are the procedures for mounting the HLX-501 to the DS-5100 and DS-5300 as typical bedside monitors. If the radio channel is changed, it is recommended the channel label be changed in advance. Although the procedure for changing the radio channel is described in Section 4 of this manual, it is recommended the work be performed by your nearest Fukuda Denshi representative.

NOTE: Depending on the country of destination, the telemetry channel select function as described in this manual, may not appear on the monitor due to regulations governed by the country for wireless transmission.

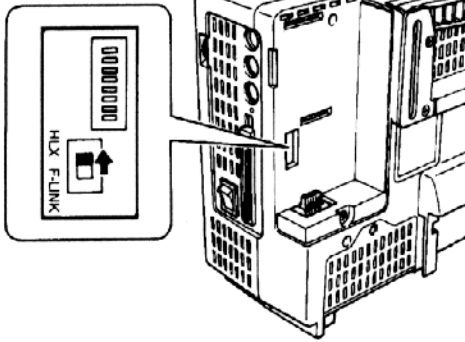
【Mounting into DS-5100】

NOTE: Before starting the mounting work, turn the main power switch on the DS-5100 OFF and disconnect the power cable from the wall outlet.



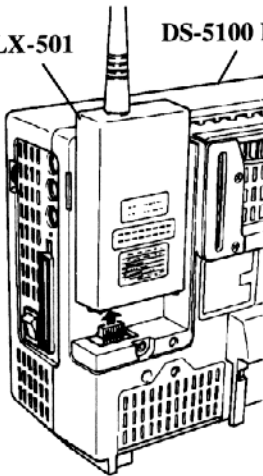
- 1 The transmission module housing is located at the upper left of the DS-5100 as viewed from the rear. Remove screw that holds the cover in place and remove the cover as shown.

**F-LINK/HLX
Switch**

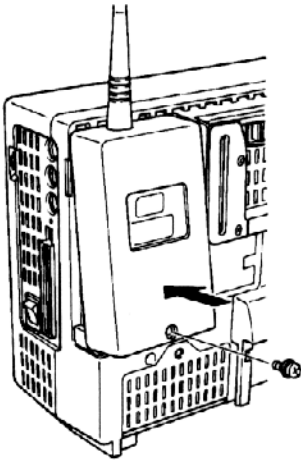


- ② The F -LINK / HLX switch is now accessible. Switch to the HLX position to effect internal communication
(Setting this switch to the HLX position disables the external F-LINK connector.)

HLX-501 DS-5100 Rea panel



- ③ Connect the cable from the bottom of the module housing to the connector at the bottom of the HLX-501. Place the HLX-501 into the housing, taking care not to jam the cable in the inside.



- 4 Remove the cap which covers the antenna hole in the top of the transmission module housing cover. Place the cover back in its original position while at the same time inserting the antenna into the antenna hole. Replace the cover onto the DS-5100 by replacing the screw at the bottom.

- 5 Reconnect the power cord and turn the DS-5100 ON. Set the telemetry channel from the telemetry set-up display on the DS-5100. For details in selecting the telemetry channel, refer to the operation manual for the DS-5100.

⚠ WARNING

Setting or changing the telemetry channel may cause interference with another telemetry system. Be sure to consult engineering for telemetry channels to select the proper radio channel which does not cause interference.

- 6 To check the system, and verify proper transmission from the HLX-501 to the telemetry receiver, check the central receiver and monitor to ensure the waveforms and alphanumeric data are properly displayed.

The wireless network system is now functioning properly.

4. Setting and Labeling the Frequency Channel and Group No.

NOTE: Depending on the country of destination, the telemetry channel select function as described in this manual, may not appear on the monitor due to regulations governed by the country for wireless transmission.

The HLX-501 uses a synthesizing method for transmission of the physiological waveforms and alphanumeric data. The frequency identification channel can be changed through the bedside monitor using the following procedure. Be sure to verify in advance that the new frequency does not interfere with that of another telemetry transmitter currently in use. Interference with another telemetry transmitter may cause accidental hazard.

- ① Check channels of all telemetry transmitters throughout the institution. If there is a manager for control of the frequency channels, consult with the manager. If not, contact your nearest Fukuda Denshi representative.
- ② After determining which frequency channels are not in use, select a frequency which will not cause interference, nor be interfered with by other frequencies.
- ③ Select the frequency for the HLX-501 according to the operation manual for the appropriate bedside monitor.
- ④ If the channel selected is different from that on the channel label, replace the channel label. Channel labels are available from Fukuda Denshi.

5 To prevent interference from/to an adjacent institution, the HLX-501 also transmits a group code for each transmitter module. There are a total of 64 different group codes. The HLX-501 is delivered from the factory with the group number set at "0".

Before data from the transmitter can be displayed on the central monitor, the telemetry receiver checks for the transmitted group code to ensure it corresponds to the receiver group code.

The group code can be selected through the bedside monitor equipped with the HLX-501. Refer to the operation manual for the bedside monitor. Contact your nearest Fukuda Denshi representative for assistance.

 **WARNING**

- **Some combinations of telemetry channels may cause interference with other telemetry systems.**
- **Be sure to verify in advance that the selection of the frequency channel does not interfere with another channel.**
- **Report the selected telemetry channel to the manager of radio channels in your institution to prevent interference between transmitters.**
- **If an adjacent institution uses a telemetry system, it is advised to inform the managers of telemetry channels for the other institutions to prevent interference.**

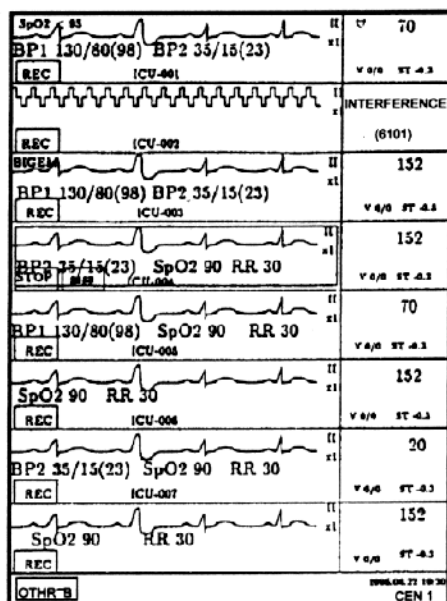
5. Setting the Receiving Channel of the Monitor


Select the telemetry receiver channel to match that of the telemetry transmission module. The monitor will display the channel number. If the transmission module has a different group code than that of the receiver, set the telemetry receiver group code to correspond to the telemetry transmission module. (For details on selecting the channel and group code, refer to the operation manual for the appropriate monitor.)

If the selected channel number does not correspond to the frequency that is actually received, an alarm waveform will be displayed to alert the staff to interference (see example below).

NOTE: The interference prevention function is not effective unless the receiver has the interference detection function.
Verify the receiver has the interference detection function and the proper channel number set.

《 Example of display on the DS-5800N central monitor 》



 **INTERFERENCE**
message with alarm

8. Specifications

Transmitting Information (will depend on bedside monitor used)

- Waveforms** : ECG x 1, 5 additional waveforms (e.g. Respiration, pulse, 3 blood pressure waveforms)
- Numeric Parameters** : All measured data (NIBP, SpO₂, Temp 1, Temp 2, BP1, BP2, BP3, Heart Rate, Respiration Rate, etc.)
- Status Information** : Low Battery, Electrode fail, Group code (64 types), Alarm, Alarm suspend, Remote record, Model ID number, Transmitter channel No.

Interface

Communications Method: RS-232C Serial Interface

Telemetry Specification

- Modulation Method** : Digital, Frequency Shift Keying (FSK)
- RF Output Power** : 1 mW
- Transmission Frequency**
- Band** : 460 to 470 MHz
- Channel spacing** : 12.5 KHz

- Power Requirements** : +5 V, 60 mA supplied from the bedside monitor

Dimensions and Weight

Dimensions : 61.5(W) x 108.5(H) x 20.5(D) mm

Weight : Approximately 100 grams

Environmental Conditions

Operating Temperature : 10 to 40 °C

Operating Humidity : 30 to 85 %R.H. no dew condensation

Storage Temperature : -10 to 60 °C

Storage Humidity : 30 to 95 %R.H.(at 60 °C)

Specifications subject to change without notice