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KYOWA

INSTRUCTION MANUAL
EDX-100A
UNIVERSAL RECORDER
(FOR CONTROL COMMAND)

Thank you for purchasing KYOWA's product EDX-100A Universal Recorder.
Read this Instruction Manual carefully in order to make full use of the high performance capabilities of the product.
Do not use the product in methods other than described in this Manual.

In addition, this Manual only describes Control Command of the EDX-100A.
For hardware, refer to the Instruction Manual of the EDX-100A Universal Recorder (For Hardware), for software operation, refer to the Instruction Manual of the DCS-100A Dynamic Recording Software (For EDX-100A Operation.)

CONTENTS

NOTATIONS USED IN THE INSTRUCTION MANUAL

This Instruction Manual is written based on the assumption that customers fully understand basic knowledge and terms related to method for creating software including the PC, TCP/IP communication, program language, etc. For details of programming, refer to commercially available textbooks, etc.

Informational Notes

- Related and reference items are enclosed with bracket quotation marks " ." In addition, header No. and header character string may be adopted. ("EDX-100A UNIVERSAL RECORDER INSTRUCTION MANUAL for Hardware," "7. CONTROL COMMAND," etc.)
- Personal Computer is denoted as the PC and EDX-100A, as the EDX.
- Conditioner cards may be described with Model names.

Strain/Voltage/Acceleration Measurement Card:	CVM-40A , CVM-41A
Strain/Voltage Measurement Card:	CDV-40B/A , CDV-40B/A-F
Dynamic Strain Measurement Card:	DPM-42B/A, DPM-42B/A-F
	DPM-42B-I, DPM-42B-I-F
Thermocouple card:	CTA-40A
F/V Converter Card:	CFV-40A
Charge Amplifier Card:	CCA-40A , CCA-40A-F
Strain/Voltage Measurement Insulation Card:	CDV-44AS
Direct rated current expansion card (120 ohm):	CDA-44AS
Direct rated current expansion card (350 ohm):	CDA-45AS
A/D Converter Card	AD-40AS, AD-40AS-F
CAN card (1 port, maximum 128 channels):	CAN-40A
CAN card (2 ports, maximum 256 channels):	CAN-41A

- Conditioner card may be simply denoted as the Conditioner.
  In addition, CAN-40A and CAN-41A may be denoted as "CAN card," and conditioner cards other than CAN card, as "Analog conditioner (card)."
- Input CH of the analog conditioner may be denoted as "Analog CH."
- CH Nos. of the analog conditioner is denoted as "CH1, CH2, ….., CH32."
- The required condition for measuring the CAN data by using the CAN-40A and CAN-40A is described as "CAN condition."
- Low pass filter may be simply denoted as "LPF" and High pass filter, as "HPF."
- When the EDX is solely used (with ID No. set to F), it is described as "Stand-alone."
- The EDX with ID No. set to '0' in synchronous operation is described as a "Master" or "Synchronous master."
- The EDX unit(s) with ID Nos. set to '1 to 7' in synchronous operation is described as "Slave(s)" or "Synchronous slave(s)."
- Unless other wise specified, prefix that is expressing the size is described as follows.
  "K" (Kilo) = 1024 and "M" (Mega) = 1048576.
  (1 Kbyte = 1024 byte, 1 Mbyte = 1048576 byte)

Precautions

The following messages are provided for reference purpose as necessary to attract your attention to information that requires special care when handing the EDX-100A UNIVERSAL RRCORDER (hereinafter referred to as the EDX).

Examples of Notations

NOTE

Essential precautions required when handling the EDX-100A.

MEMO

Reference items required when handling the EDX-100A.

1. OUTLINE

This Instruction Manual is to define Communication Command through LAN or USB interface between the EDX and the PC. The EDX and the PC is connected via LAN or USB, thereby enabling the PC to control the EDX with the Communication Command.
This Instruction Manual is written based on the assumption that customers fully understand basic knowledge of the LAN or USB including programming using TCP/IP or socket. For details, refer to commercially available textbooks, etc.
In addition, for how to connect the EDX and the PC, how to prepare the EDX for every communication interface, and for details of conditioners, refer to the "EDX-100A UNIVERSAL RECORDER INSTRUCTION MANUAL for Hardware" when required.

NOTE

- The USB interface is applicable only on Windows OS.
- The Instruction Manual is written on the premise that the EDX firmware version is 01.45 and after.

When control command data (hereinafter referred to as the Command packet) is sent to the EDX from the PC, the EDX conducts the specified operation and processing and then, returns the response data (hereinafter referred to as the Response packet) to the PC. Format of the Command and Response packets are in common with LAN and USB interfaces.

When using the LAN interface, the PC communicates with the EDX using API (Application Program Interface) called socket. The socket is a communication API using the TCP/IP protocol and normally it is provided as OS or middleware package. The PC sends the Command packet to the EDX using data transfer function of the socket and receives the Response packet from the EDX using data receiving function.

When using the USB interface, the PC communicates with the EDX by using the dedicated USB device driver, which controls the EDX. The PC sends the Command packet to the EDX using data transfer function of the USB device driver and receives the Response packet from the EDX using data receiving function.

2. TYPES OF VARIABLES

This Chapter is to define various types of variables used in Command packet and Response packet.
Assignment of variables with more than 2 bytes is in little endian format.

MEMO

- Notation “0x****” on and after then denotes a hexadecimal value.

Types of Variables	The Number of Bytes	Notation	Supplement
signed char	1	char	8-bit variable with sign
unsigned char	1	BYTE	8-bit variable without sign
signed short	2	short	16-bit variable with sign
unsigned short	2	WORD	16-bit variable without sign
signed long	4	long	32-bit variable with sign
unsigned long	4	DWORD	32-bit variable without sign
signed int64	8	INT64	64-bit variable with sign
unsigned int64	8	UINT64	64-bit variable without sign
Float	4	float	Single precision floating decimal point variable
Double	8	double	Double precision floating decimal point variable

3. COMMUNICATION VIA LAN INTERFACE

When controlling the EDX through LAN (TCP/IP), the PC is a TCP client and the EDX, the TCP server. The PC sends various requests such as connect, disconnect, data transfer, and data receive to the EDX and the EDX returns response to the above requests to the PC.
When LAN connection is successfully established with the PC, the EDX [REMOTE] LED lights up green to indicate that the EDX is in remote operating status through LAN.

3-1 SETTING THE EDX-100A

Since the TCP/IP is used, it is required to set enabled IP address, subnet mask, gateway address, etc. on the EDX side. When using a network that is closed only between the PC and EDX, users can freely set each of the addresses. However, when using the EDX by connecting to the existing network, consult the Network Administrator in advance. In addition, it is required to use the LAN as the communication interface of the EDX.
For how to set the LAN interface, refer to "EDX-100A UNIVERSAL RECORDER INSTRUCTION MANUAL for Hardware.

NOTE

- The EDX is not corresponding to obtaining dynamic IP addresses such as DHCP, etc.

3-2 SETTING THE PC

Create a control program using socket API on user's side. Since 2 communication ports are used in the EDX, it is required to prepare 2 sockets. The ports are described in the following.

Port No.	Application
34580	For Control Command (Used for all commands)
34581	For obtaining monitor data (Used for the GMD command only)

NOTE

- EDX is using the communication port of 34381, 34385, 34580, and 34581.
  The communications port 34381 and communication port 34385 are reserved for the EDX. Do not use the 34381 and 34385.
- When setting firewall, etc. on the PC side, the LAN communication may be suspended. Set an appropriate setting that enables communication with the EDX.

3-3 OUTLINE OF COMMUNICATION PROCEDURES

Socket API (function) provided on the PC side is used for sending and receiving Command and Response packets. For details, refer to the relevant API materials, etc. In addition, for format of the Command or Response packets, see “5. CONTROL COMMAND SEND/RECEIVE PROTOCOL.”

Outline of LAN communication procedures is described in the following.

1) Prepare 2 sockets corresponding to port Nos. and set necessary optionals, etc.
2) Send connection request to the EDX ("connect").
3) Send Command packet to the EDX through the socket ("send").
4) Receive Response packet from the EDX through the socket ("recv").
5) Repeat procedures in items 3) and 4) when necessary.
6) Send shutdown request to the EDX ("shutdown").
7) Release the sockets.

4. COMMUNICATION VIA USB INTERFACE

When controlling the EDX through the USB interface, the application program makes a demand to the EDX for control command send/receive request through KYOWA's USB communication API library (EDX100.DLL) function dedicated for the EDX.

NOTE

- The USB interface is applicable only for Windows OS.
- When connecting the EDX to the PC by using the USB interface, the EDX requires the user to install the USB device driver for the EDX to work properly. For how to install the USB device driver, see the "EDX-100A Universal Recorder Instruction Manual for Hardware."

4-1 SETTING THE EDX

It is required to set the 'USB' as the EDX communication interface. For how to set the USB, see "EDX-100A Universal Recorder Instruction Manual (For Hardware)."

4-2 ESSENTIAL FILES

The following files are essential for creating and conducting an application program.
The following files are saved in the DVD, "EDX-100A" - "USBLIB" folder, attached to the EDX

1) EDX100.H ..... API defined file (Required when creating the program)
   Should be included in the API using source file.
2) EDX100.LIB ..... API import library (Required when creating the program)
   Should be linked to the library when creating the program.
3) EDX100.DLL ..... API library main body (Required when conducting the program)
   Should be copied to the same folder with the application program.

4-3 API FUNCTION

4-3-1 List of API Functions

Function	Function Name
USB library start processing	EDX100_UsbOpen()
USB library end processing	EDX100_UsbClose()
Receive timeout	EDX100_UsbSetTimeOut()
Connection check	EDX100_UsbConnectCheck()
Send Command	EDX100_UsbSendCmd()
Response command	EDX100_UsbReceiveCmd()
Target reset	EDX100_UsbTargetReset()

4-3-2 List of Return Value of API Function

Return value of the API function is described in the following table.

Return Value	Results
0	Normally ended
Numeric value more than 1	The number of received bytes (Only EDX100_UsbReceiveCmd( ))
-2	Argument is faulty
-100	No device of the argument specified ID No. exists.
-101	Communication error or timeout error
-102	Internal DLL error

4-3-3 Details of API Function

1) EDX100_UsbOpen

Function	Initialization process of USB library
Definition	int EDX100_UsbOpen(void)
Return Value	See the list of return values.
Memo	Do not forget to conduct initialization process when starting the application program. By activating this function, initialization process of the DLL and EDX contact monitoring process are conducted inside the PC. * After conducting this function, connect the EDX to the PC. Then, the EDX [REMOTE] LED lights up orange to indicate that the EDX is in remote operating status via USB.

2) EDX100_UsbClose

Function	End process of the USB library
Definition	int EDX100_UsbClose(void)
Return Value	See the list of return values.
Memo	Do not forget to conduct end process when ending the application program. By activating this function, DLL using resource is released. * After conducting this function, the [REMOTE] LED of the connected EDX lights out to indicate that remote operating status is cancelled.

3) EDX100_UsbSetTimeOut

Function	Set receive timeout time
Definition	int EDX100_UsbSetTimeOut(WORD wTimeOut)
Argument	wTimeOut Timeout time (0 to 60 [sec], Default: 15)
Return Value	See the list of return values.
Memo	

4) EDX100_UsbConnectCheck

Function	Returns status of the connected EDX
Definition	int EDX100_UsbConnectCheck(WORD *pwConnect)
Argument	pwConnect Folder destination of the EDX connected status
Return Value	See the list of return values.
Memo	ID No. of the connected EDX is returned to the argument pwConnect with a value corresponding to bit. If the EDX is connected, the relevant bit is set to '1.' The EDX with ID No. '0' is relevant to bit '0' and the EDX with ID No. 'F,' to bit '15.' Ex.) When one EDX with ID No. 'F' is connected, 0x8000 is returned. Ex.) When two EDX units with ID Nos. '0' and '1' are connected, 0x0003 is returned.

5) EDX100_UsbSendCmd

Function	Sends Command packet	
Definition	int EDX100_UsbSendCmd(int nIdNo, DWORD dwSendByte, void *pSendCmd)	
Argument	nIdNo	ID Nos. (0 to 7, 15 15=ID No. F) of the send destination EDX
	dwSendByte	Size of the sending Command packet (byte).
	pSendCmd	Folder for storing the sending Command packet
Return Value	See the list of return values.	
Memo	To be error when the send destination EDX is not connected. Before using this command, check whether the send destination EDX is connected with the EDX100_UsbConnectCheck() function.	

6) EDX100_UsbReceiveCmd

Function	Receives Command Response Packet	
Definition	int EDX100_UsbReceiveCmd(int nIdNo, void *pReceiveCmd, DWORD dwReceiveSize)	
Argument	nIdNo	ID Nos. (0 to 7, 15 15=ID No. F) of the response destination EDX.
	pReceiveCmd	Folder for storing the received Command Response packet.
	dwReceiveSize	Size of the folder destination for storing the command Response packet (byte).
Return Value	See the list of return values.	
Memo	To be error when the receive destination EDX is not connected. Before using this command, check whether the receive destination EDX is connected with theEDX100_UsbConnectCheck( ) function. Size of the folder destination for storing the Command Response packet varies with the command. Prepare a folder with a size that can sufficiently save the response data of the commands.	

7) EDX100_UsbTargetReset

Function	After disconnecting the USB wiring of the EDX with the specified ID No., reconnect the USB.
Definition	int EDX100_UsbTargetReset (int nIdNo)
Argument	nIdNo ID Nos. (0 to 7 and 15 15=ID N0. F) of the target EDX
Return Value	See the list of return values.
Memo	To be error when the EDX with the specified ID No. is not connected. Before using this function, check whether the EDX with the specified ID No. is connected with EDX100_UsbConnectCheck( ) function.

4-4 OUTLINE OF COMMUNICATION PROCEDURES

To send/receive the Command and Response packets, use API (Function) of the USB communication API library. For formats of the Command and Response packets, see "5. CONTROL COMMAND SEND/RECEIVE PROTOCOL."

Outline of USB communication procedures is described in the following.

1) Call EDX100_UsbOpen( ) function and conduct initialization process of the USB library.
2) Prepare a Command packet.
3) Call EDX100_UsbConnect Check( ) function and check the connected status of the EDX.
4) Call EDX100_UsbSendCmd( ) and send the Command packet to the EDX.
5) Call EDX100_UsbConnectCheck and check the connected status of the EDX.
6) Call EDX100_UsbReceiveCmd( ) and receive Response packet from the EDX.
7) Repeat procedures from items 2) and 6) if required.
8) Call EDX100_UsbClose( ) and conduct end process of the USB library.

5. CONTROL COMMAND SEND/RECEIVE PROTOCOL

5-1 COMMAND PACKET (PC → EDX)

This section describes format used for sending Command packet to the EDX from the PC.
The Command packet is composed of fixed length header section, fixed length command identifier, and variable length parameter section. According to the respective control commands, after constructing an appropriate Command packet, the Command packet is sent to the EDX from the PC.

Header section (128 bytes fixed)	Command identifier (3 bytes fixed)	Parameter section (Variable length)

■ Description of Items

● Header: Always add the following format header at the head of the control command.

No.	Item Name	Types of Variables	The Number of Bytes	Contents
1	Model name	char	20	Fixed character string of the “EDX-100A” (“ ” is not included.)
2	The number of transferred bytes	DWORD	4	Command identifier + The number of parameter bytes
3	Monitor data point	DWORD	4	Enabled only for synchronous operation Used when obtaining monitor data. See “7-3-13 Obtaining Monitor Data (GMD)”
3	Reserved	char	100	
Total			128	

● Command identifier: Character string of ASCII code (3 alphabets, uppercase characters)

● Parameter: When parameters are required for the command, additionally mention it just after the command.

NOTE

- When defining the structure variable, take care to the data packing.
- When constructing a header section by the PC, after initializing the entire header section with ‘0x00,’ set the required items.

5-2 RESPONSE PACKET (EDX → PC)

After sending the Command packet from the PC to the EDX, since the EDX returns the Response packet to the PC, the PC must receive the Response packet from the EDX. The Response packet is composed of fixed length header and variable length response data sections. The size and format of the response data section depends on the command that is sent to the EDX from the PC just before.
Format of the Response packet is described in the following.

Header section (128 bytes fixed)	Response data section (Variable length)

■ Description of Items

● Header: Always add the following format header at the head of the Response packet.

No.	Item Name	Types of Variable	The Number of Bytes	Contents
1	Model Name	char	20	Fixed character string of the "EDX-100A" (" " is not included.)
2	The number of response data bytes	DWORD	4	Size of response data section. '0': Only header section with no response data.
3	Monitor data point	DWORD	4	Enabled only for synchronous operation. Used when obtaining monitor data. See "7-3-13 Obtaining Monitor Data (GMD)."
4	EDX status	DWORD	4	EDX status. See "5-3 EDX STATUS."
5	EDX error status	DWORD	4	EDX error generating status. See "5-4 EDX ERROR STATUS."
6	Input exceeding status	DWORD	4	Whether input exceeded for every CH. See "5-5 INPUT OVER STATUS."
7	The number of already recoded data	INT64	8	The number of already recorded data in the current data recording operation. To be 0 cleared when A/D conversion is stopped.
8	File name	char	22	Base file name character string of maximum 20 characters. (Extension, file No., etc. are not added.) (*1)
9	File No.	WORD	2	Nos. (0 to 9999) following after the file name (*1)
10	The number of repeat times	WORD	2	Repeated numbers (0 to 9999) of the current trigger or interval measurement. Always set to '0' in manual measurement. (*1)

No.	Item Name	Types of Variable	The Number of Bytes	Contents
11	Next interval start time	WORD	2	Year (2000 to 2099) (*2)
12		BYTE	1	Month (1 to 12) (*2)
13		BYTE	1	Day (1 to 31) (*2)
14		BYTE	1	Hour (1 to 23) (*2)
15		BYTE	1	Minute (1 to 59) (*2)
16		BYTE	1	Second (1 to 59) (*2)
		char	1	Reserved
17	Response data type	BYTE	1	0: Sends only header section. No response data exists. 1: Response data to the control command. 2: Response data to monitor data obtaining command (GMD).
18	EDX-ID No.	char	1	-1: Stand-alone 0: Synchronous master 1 to 7: Synchronous slave
19	Slave EDX connected status	WORD	2	Master EDX is only enabled Slave EDX connected status is displayed with a value corresponding to bit. Ex.1) When the EDX with ID=3 is connected, → 0x0004 Ex.2) When the EDX with ID = 1 and 3 is connected, → 0x0005
20	Voice memo recordable period	WORD	2	0 to 1048 sec
21	The number of voice memo recordable times	BYTE	1	0 to 254 times
22	Reserved	char	3	
23	The number of recordable data	INT64	8	The number of recordable data with current measuring condition (*3) Enabled only when A/D conversion is operating.
24	Reserved	char	28	
Total			128	

(*1) For how to name the data file name, see “5-6 RECORDED FILE NAME.”

(*2) To be set to ‘0 ’ except during conducting interval measurement.

(*3) The number of recordable data

The number of recorded data shall be set as follows according to measuring mode.

- Manual measurement (with the number of data not specified):
  The number of CF save available data
- Manual measurement (with the number of data specified):
  The number of specified data
- Trigger measurement (Start only):
  The number of pre-data + The number of recorded data
- Trigger measurement (Start + End):
  Before the end trigger, the number of data that can be stored in the CF card.
  After the end trigger, the number of data that can be stored up to the end trigger + Post-trigger delay amount.
- Interval measurement:
  The number of specified data in interval measurement.
- PC recording mode:
  Always set to '0.'

● Response data section:

The response data section is variable length data and contents and data size vary with control commands. For details, see "7-3 DETAILED SPECIFICATIONS OF CONTROL COMMAND."

MEMO

• For the actual examples of the Command packet and Response packet, see "7-4 EXAMPLE OF DATA DUMP OF COMMNNICATION PACKET."

NOTE

• Size of the Response packet is maximum 512 KB (524,288 bytes)
For folder destination for receiving the Response packet, secure sufficient size memory.

5-3 EDX STATUS

The EDX status is stored in the header section of Response packet. The EDX status is in 32-bit numeric value and can be checked by this status. Although bits are independently set, they may be set together at the same time. Depending on the EDX status, there may be a limit when conducting the command. See also "7-2 ENABLE/DISABLE OF CONTROL COMMAND."

Bit Value	Contents
0x00000001	A/D conversion start available
0x00000002	A/D conversion operating (Measuring)
0x00000004	(Reserved)
0x00000008	(Reserved)
0x00000010	Manual measurement data recording
0x00000020	Manual measurement data recording temporarily stopping
0x00000040	Waiting for trigger measurement
0x00000080	Trigger measurement data recording
0x00000100	Waiting for interval measurement
0x00000200	Interval measurement data recording
0x00000400	(Reserved)
0x00000800	(Reserved)
0x00001000	Voice memo recording
0x00002000	Conducting balance, sensitivity compensation, average value measurement
0x00004000	+CAL outputting
0x00008000	-CAL outputting
0x00010000	CF card installing
0x00020000	CF card accessing (BUSY)
0x00040000	During opening or finding the file by control command
0x00080000	Conducting CHK command
0x00100000	Battery alarm
0x00200000	(Reserved)
0x00400000	(Reserved)
0x00800000	(Reserved)
0x01000000	(Reserved)
0x02000000	(Reserved)
0x04000000	Over data is generated during A/D conversion
0x08000000	Discontinuous monitor data
0x10000000	(Reserved)
0x20000000	(Reserved)
0x40000000	(Reserved)
0x80000000	Error occurred status (1 = Error occurring, 0 = No error) (For details, see "5-4 EDX ERROR STATUS.")

MEMO

Relation between A/D conversion and EDX status is described in the following.

- A/D conversion start available status 0x00000001 is set.
- Monitoring 0x00000003 is set and 0x00000010 to 0x00000200 is cleared.
- Manual measurement data recording 0x00000013 is set.
- Manual measurement data recording temporarily stopping 0x00000023 is set.
- Waiting for trigger measurement 0x00000043 is set.
- Trigger measurement data recording 0x00000083 is set.
- Waiting for interval measurement 0x00000103 is set.
- Interval measurement data recording 0x00000203 is set.

5-4 EDX ERROR STATUS

The EDX status is described in 32-bit numeric values. When hardware related error occurred in the EDX, the following bit is set. Details of error contents can be checked with these error statuses.
When fatal error occurred, it can be cleared by restoring the EDX power. However, if error is not cleared or if the error still occurs, contact KYOWA or our representative for repair.

Bit Value	Contents
0x00000001	Folder capacity for storing the measured data is not enough.
0x00000002	Oscillator for DPM card is faulty
0x00000004	External clock error
0x00000008	CF card access error (Write error)
0x00000010	(Reserved)
0x00000020	Error occurred in display LED board (Fatal)
0x00000040	Error occurred in CPU board (Fatal)
0x00000080	Error occurred in voice board (Fatal)
0x00000100	Error occurred in EEPROM of Slot 1 installed card (Fatal)
0x00000200	Error occurred in EEPROM of Slot 2 installed card (Fatal)
0x00000400	Error occurred in EEPROM of Slot 3 installed card (Fatal)
0x00000800	Error occurred in EEPROM of Slot 4 installed card (Fatal)
0x00001000	Error occurred in EEPROM on the CPU board (Fatal)
0x00002000	(Reserved)
0x00004000	(Reserved)
0x00008000	(Reserved)
0x00010000	(Reserved)
0x00020000	(Reserved)
0x00040000	(Reserved)
0x00080000	(Reserved)
0x00100000	(Reserved)
0x00200000	(Reserved)
0x00400000	(Reserved)
0x00800000	(Reserved)
0x01000000	(Reserved)
0x02000000	(Reserved)
0x04000000	(Reserved)
0x08000000	(Reserved)
0x10000000	(Reserved)
0x20000000	(Reserved)
0x40000000	(Reserved)
0x80000000	(Reserved)

The conditions to which EDX error status is set, and the conditions to which EDX error status is cleared are shown below.

- Folder capacity for storing the measured data is not enough.

To set:

When inserting a CF card, when start monitoring data, or when the following recording data is prepared after recording ends by measurement with repetition, since the remaining capacity is not enough, file data cannot be recorded under the current conditions.

To clear:

When inserting a CF card, when start monitoring data, or when the following recording data is prepared after recording, after deleting files (by the FDF command), single file or more data can be recorded under the current conditions.

- Oscillator for DPM card is faulty.

To set:

When the inputting oscillator signal is faulty while using a DPM card with the external oscillator. For details, see "DPM-42A/DPM-42A-F Dynamic Strain Amplifier Card Instruction Manual for EDX-2000A" and "DPM-42B/DPM-42B-I/DPM-42B-F/DPM-42B-I-F Instruction Manual for EDX series."

When the synchronous cable (N-95) is not properly connected during the synchronous operation.

To clear:

When inputting the correct oscillator signal.

- External clock error

To set:

When the inputting external clock signal level is not within the specifications while using the external-clock-input function. (For details, see "EDX-100A Universal Recorder Instruction Manual for Hardware.")

When the synchronous cable (N-95) is not properly connected during the synchronous operation.

To clear:

When inputting the correct external clock signal.

- CF card access error

To set:

When an error occurs while creating a new recorded file or while writing data.

To clear:

When creating a new recorded file or writing data is properly ended.

When inserting or removing the CF card.

5-5 INPUT OVER STATUS

32-bit value indicates input over status of each CH. The most significant bit is corresponding to CH32 and the least significant bit, to CH1. When the input signal exceeds the preset range during A/D conversion, the relevant bit is set.
(For example, when CH1 and CH31 detected the excessive input during A/D conversion, 0x40000001 is set.)
In addition, this bit indicates the history of the excessive inputs and it is not cleared even if the excessive input status is cancelled. Conditions to be cleared are described in the following.

- When A/D conversion is temporarily suspended and started once again.
- When conducting start recording operation (REC).
- When conducting balance and internal sensitivity compensation.

5-6 RECORDED FILE NAME

Data file name recorded in the EDX is named as follows according to file No. and the number of repeat times.

○○○***_▲□□□□_◊.KS2

○○○:	Arbitrary file name (Maximum 20 characters)
****:	File No. (0000 to 9999) Automatically incremented when recording ends.
▲:	Measuring mode in interval and trigger measurement I: Interval measurement A: Analog trigger measurement E: External trigger measurement C: Complex trigger measurement
□□□□:	The number of repeat times (0000 to 9999) in interval and trigger measurements Automatically incremented every time one recording ends.
◊:	EDX-ID No. (0 to 7) for synchronous operation
KS2:	File extension is KS2 fixed.

Ex. 1) Manual measurement of stand-alone operation (File No. = 0)
TEST0000.KS2

Ex 2) Manual measurement (File No. = 0) of synchronous master (ID=0)
TEST0000_0.KS2

Ex. 3) Interval measurement of stand-alone operation (File No.=0, The number of repeat times=0)
TEST0000_I0000.KS2

Ex. 4) Interval measurement of synchronous slave (ID=1) (File No. =0, The number of repeat times=0)
TEST0000_I0000_1.KS2

6. ERROR CODE

Error code is indicated with 1 byte of the char type. If it is stated as 'Standard type' in Response data of control commands, the Response data is considered as the error code. In addition, if error occurred during control command process, this error code is returned without returning the Response data stated in the control commands.
Error codes are listed in the following table.

Error Code No.	Error Contents
0	Normally ended.
-1	Unknown command
-2	Parameter error
-3	Context error (Cannot conduct in the current EDX status.)
-4	CF card is not inserted.
-5	Remaining capacity of the CF card is not enough.
-6	No file.
-7	Read error
-8	Write error
-9	No operation target exists.
-10	Cannot conduct because the file is operating by control command.
-11	A/D conversion is disabled because file No. exceeded 9999. (REC command return value) (When CF card is changed after starting A/D conversion.)
-12	Setting/reading is disabled due to hardware error
-13	Interval measurement is finished

7. CONTROL COMMAND

7-1 LIST OF CONTROL COMMANDS

EDX control available commands are listed in the following table.

Type	Contents	Command Name	Ref. Page
Measuring Condition	Obtain data file name	DFN	27
	Set/read monitor data output condition	SMD	28
	Save/read measuring condition file	MCF	30
	Check measuring condition	CHK	31
	Initialize measuring condition	INI	33
	Set/read measuring condition	MES	35
Execute	Start A/D conversion	STA	36
	Start recording	REC	37
	Stop A/D conversion/recording	STP	38
	Pause recording operation	PAU	39
	Conduct and stop CAL/Over reset	CAL	40
	Conduct balance/Read balance results	BAL	41
	Obtain monitor data	GMD	43
	Set/read keylock status	LOC	47
	Read EDX status	——	48
Environment	Set/read time	TIM	49
	Set/read TCP/IP information	NET	51
System	Read system information	SYS	52
	Read card information	CAD	53
File	Obtain remaining capacity of CF card	FFR	55
	Open file	FOF	56
	Read file data	FRF	57
	Seek file	FSF	58
	Close file	FCF	59
	Delete file	FDF	60
	Start finding file	FFF	61
	Continue finding file	FFN	63
	End finding file	FFC	64
Others	Set/read balance target CH	SBC	65
	Set/read CAL target CH	SCC	66
	Measure/obtain average value	AVG	67
	Read TEDS information	TED	69
	Read/write the user data	URW	75

7-2 WHETHER CONTROL COMMAND IS ENABLED OR DISABLED

Depending on the EDX status or synchronous connection status, usable control commands may be restricted in some cases. Whether conducting control commands is enabled or disabled is listed in the following table. For EDX status, see "5-3 EDX STATUS."

1) For stand-alone EDX and synchronous master EDX (A/D conversion is in stop status)

Command	Stopping A/D conversion						
	A/D disable status	A/D enable status	Finding file	Opening file	Accessing to CF card (*1)	Checking measuring condition (*2)	Conducting BAL and AVG (*3)
DFN		✔					
SMD	✔	✔				✔	
MCF	✔	✔					
CHK	✔	✔				▲	
INI	✔	✔					
MES	✔	✔				▲	
STA		✔					
REC							
STP							
PAU							
CAL		✔					
BAL		✔				▲	
GMD							
LOC	✔	✔				✔	
——	✔	✔	✔	✔	✔	✔	✔
TIM	✔	✔				✔	
NET	✔	✔				✔	
SYS	✔	✔				✔	
CAD	✔	✔				✔	
FFR	✔	✔					
FOF	✔	✔					
FRF	(*4)	(*4)		✔			
FSF	(*4)	(*4)		✔			
FCF	(*4)	(*4)		✔			
FDF	✔	✔					
FFF	✔	✔					
FFN	(*5)	(*5)	✔				
FFC	(*5)	(*5)	✔				
SBC	✔	✔				✔	
SCC	✔	✔				✔	
AVG		✔					
TED	✔	✔				✔	
URW	✔	✔					

✔: Enabled and ▲: Only reading is enabled

(*1) After conducting the FDF command (Deleting file), EDX status is displayed until the desired file is completely deleted.
(*2) EDX status after conducting non-complete type CHK command (Check measuring condition).
(*3) EDX status while conducting balance, internal sensitivity compensation, or measuring average value.
(*4) Enabled only during opening file.
(*5) Enabled only during finding file.

2) For stand-alone EDX and synchronous master EDX (A/D conversion operating status)

Command	Monitoring	Manual measurement		Trigger measurement		Interval measurement	
		Recording	Recording temporarily stopping	Waiting	Recording	Waiting	Recording
DFN	✔	✔	✔	✔	✔	✔	✔
SMD	✔	✔	✔	✔	✔	✔	✔
MCF							
CHK							
INI							
MES	▲	▲	▲	▲	▲	▲	▲
STA							
REC	✔		✔				
STP	✔	✔	✔	✔	✔	✔	✔
PAU		✔ (*1)					
CAL	✔	✔	✔	✔	✔	✔	✔
BAL	✔		✔				
GMD	✔	✔	✔	✔	✔	✔	✔
LOC	✔	✔	✔	✔	✔	✔	✔
——	✔	✔	✔	✔	✔	✔	✔
TIM	▲	▲	▲	▲	▲	▲	▲
NET	▲	▲	▲	▲	▲	▲	▲
SYS	▲	▲	▲	▲	▲	▲	▲
CAD	▲	▲	▲	▲	▲	▲	▲
FFR							
FOF							
FRF							
FSF							
FCF							
FDF							
FFF							
FFN							
FFC							
SBC	✔	✔	✔	✔	✔	✔	✔
SCC	✔	✔	✔	✔	✔	✔	✔
AVG							
TED							
URW							

✔: Enabled and ▲: Only reading is enabled

(*1) Enabled only during recording data in manual measurements.

3) Synchronous slave EDX (A/D conversion is in stopped status)

Command	During stopping A/D conversion						
	A/D disable status	A/D enable status	Finding file	Opening file	Accessing to CF card (*1)	Checking Measuring condition (*2)	Conducting BAL, AVG (*3)
DFN		✔					
SMD	✔	✔					
MCF	✔	✔					
CHK	✔	✔				▲	
INI	✔	✔					
MES	✔	✔					
STA							
REC							
STP							
PAU							
CAL							
BAL							
GMD							
LOC	✔	✔					
——	✔	✔	✔	✔	✔	✔	✔
TIM	✔	✔					
NET	✔	✔					
SYS	✔	✔					
CAD	✔	✔					
FFR	✔	✔					
FOF	✔	✔					
FRF	(*4)	(*4)		✔			
FSF	(*4)	(*4)		✔			
FCF	(*4)	(*4)		✔			
FDF	✔	✔					
FFF	✔	✔					
FFN	(*5)	(*5)	✔				
FFC	(*5)	(*5)	✔				
SBC	✔	✔					
SCC	✔	✔					
AVG							
TED	✔	✔					
URW	✔	✔					

✔: Enabled and ▲: Only reading is enabled

(*1) After conducting the FDF command (Deleting file), EDX status till the desired file is completely deleted.

(*2) EDX status after conducting non-complete type CHK command (Checking measuring condition).

(*3) EDX status while conducting balance, internal sensitivity compensation, or measuring average value.

(*4) Enabled only during opening file.

(*5) Enabled only during finding file.

4) Synchronous slave EDX (A/D conversion operating status)

Command	Monitoring	Manual measurement		Trigger measurement		Interval measurement	
		Recording	Recording temporarily stopping	Waiting	Recording	Waiting	Recording
DFN	✔	✔	✔	✔	✔	✔	✔
SMD	✔	✔	✔	✔	✔	✔	✔
MCF							
CHK							
INI							
MES	▲	▲	▲	▲	▲	▲	▲
STA							
REC							
STP							
PAU							
CAL							
BAL							
GMD	✔	✔	✔	✔	✔	✔	✔
LOC	✔	✔	✔	✔	✔	✔	✔
———	✔	✔	✔	✔	✔	✔	✔
TIM	▲	▲	▲	▲	▲	▲	▲
NET	▲	▲	▲	▲	▲	▲	▲
SYS	▲	▲	▲	▲	▲	▲	▲
CAD	▲	▲	▲	▲	▲	▲	▲
FFR							
FOF							
FRF							
FSF							
FCF							
FDF							
FFF							
FFN							
FFC							
SBC	✔	✔	✔	✔	✔	✔	✔
SCC	✔	✔	✔	✔	✔	✔	✔
AVG							
TED							
URW							

✔: Enabled and ▲: Only reading is enabled

7-3 DETAILED SPECIFICATIONS OF CONTROL COMMAND

This section describes detailed information for every control command.
When sending the control command from the PC to the EDX, construct a Command packet with header (128-byte fixed length), command identifier (3-byte fixed length), and parameter (variable length). The number of transferred bytes in the header section includes the total number of bytes of the command identifier and parameter.
The PC receives the response data of Response packet added with header section (128-byte fixed length) at the head from the EDX. Since the size of response data succeeding the header section is written with the number of response data bytes in the header, the PC can receive the entire Response packet from the EDX. For details of Command packet and Response packet, see "5. CONTROL COMMAND SEND/RECEIVE PROTOCOL."

MEMO

- Although response data is almost 2bytes or more, PC might receive 1byte Data.
  In this case, error occurred and the EDX is returning error codes as the response data. For details, see "6. ERROR CODE."
- Depending on the EDX status, a certain command may become disabled. See "7-2 WHETHER CONTROL COMMAND IS ENABLED OR DISABLED."

NOTE

- Description of CAN-40A and CAN-41A (CAN card) is omitted in this Instruction Manual. If it is required to control these cards, contact KYOWA or our representative.

7-3-1 Obtaining Data File Name (DFN)

Obtain the pre-set data file name.

- Command: DFN
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3 bytes
- Parameter: None

No.	Name	Contents	Types of Variable	The Number of Bytes
1	Command	DFN	char	3
Total of the number of transferred bytes				3

- Response data: 48 bytes

No.	Name	Contents	Types of Variable	The Number of Bytes
1	Response data 1	Data file name with extension Ex.) TEST0000_I0000_0.KS2	char	48
Total number of response data bytes				49

Regarding the following case, all the Response data 1 shall be '0x00.'

- When A/D conversion is not available.
- When CF card is not installed.

NOTE

- For synchronous operation, when the A/D conversion is started, the final file information is set from the synchronous master to synchronous slave EDX. Therefore, for synchronous slave EDX, results of this command may differ before and after the start of A/D conversion.
- To obtain the correct data file name, conduct this command during A/D conversion.

7-3-2 Setting/Reading Monitor Data Output Condition (SMD)

Sets and reads monitor data output condition.

- Command: SMD
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 12 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SMD	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x01.	BYTE	1
3	Parameter 2	Monitor data output mode (*1) -1: No monitor data output 0: Continuous monitor data output mode 1: Intermittent monitor data output mode (Master EDX) 2: Intermittent monitor data output mode (Slave EDX)	char	1
4	Parameter 3	Reserved	char	7
Total number of transferred bytes				12

(*1) Monitor output mode

- When no monitor data is output (Monitor data output mode = -1)
  Not outputting monitor data.
  Even if monitor data obtaining command (GMD) is sent, the number of monitor data is always '0.'
  When the EDX is in off-line status, this mode is automatically set.
- For continuous monitor data output mode (Monitor data output mode = 0)
  Monitor data of all the connected EDX units is continuously obtained.
  Depending on the number of connected EDX units and PC's performance, all the monitor data may not be obtained.
- For intermittent monitor data output mode (Monitor data output mode = 1 or 2)
  Monitor data is intermittently obtained.
  Although the preset number of monitor data output data is continuous monitor data, it lacks in continuity with data of the monitor data obtained the next time.

MEMO

- Output mode = 1(Master EDX) and 2 (Slave EDX) have no connection with master EDX/Slave EDX of synchronous operation. The EDX of the standard monitor data output is expressed as the master unit.

The following shows examples of obtaining monitor data of four EDX units (ID=0, 1, 2, and 3) in synchronous operation by setting the mode to intermittent monitor data output mode.

Ex. 1) Monitor data output mode when obtaining monitor data of all the EDX units.
Set '1' to ID=0 and '2' to ID=1, 2, and 3.

Ex.2) Monitor data output mode when obtaining monitor data of EDX of only ID=0 and ID=3.
Set '1' to ID=0, '2' to ID=3, and '-1' to ID=1 and 2.

Ex.3) Monitor data output mode when obtaining monitor data of EDX of only ID=1 and ID=3.
Set '1' to ID=1, '2' to ID=3, and '-1' to ID=0 and 2.

- Response data: Standard type (1 byte)

♦♦♦When reading ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SMD	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
Total number of transferred bytes				4

- Response data: 8 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Monitor data output mode -1: No monitor data output 0: Continuous monitor data output mode 1: Intermittent monitor data output mode (Master EDX) 2: Intermittent monitor data output mode (Slave EDX)	char	1
2	Response data 2	Reserved	char	3
3	Response data 3	The number of monitor output data per CH Enabled only when monitor output mode is 1 or 2.	DWORD	4
Total number of response data bytes				8

MEMO

• For obtaining monitor data, see also "7-3-13 Obtaining Monitor Data (GMD)."

7-3-3 Saving/Reading Measuring Condition File (MCF)

Saves measuring condition preset in the EDX to the CF card or reads measuring condition stored in the CF card and sets the obtained measuring condition in the EDX.

- Command: MCF
- Target EDX: Stand-alone, synchronous master, synchronous slave

- The number of transferred bytes: 4 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The umber of Bytes
1	Command	MCF	char	3
2	Parameter 1	Measuring condition file save/read mode 0: Read 1: Save	BYTE	1
Total number of transferred bytes				4

- Response data: Standard type (1 byte)

MEMO

- When Read (0) is selected in Parameter 1, measuring condition stored in the CF card is set in the EDX and the measuring condition is automatically checked (relevant to CHK command) on the EDX side.
- When Save (1) is selected in Parameter 1, measuring condition is automatically checked (relevant to CHK command) on the EDX side and only when in the status available for starting A/D conversion, after updating the measuring condition in the EDX, the checked measuring condition is saved in the CF card.

NOTE

- Checking measuring condition automatically conducted by the EDX with the MCF command is only for the target EDX. For synchronous operation, before starting the measurement, always conduct CHK command to each EDX.

7-3-4 Checking Measuring Condition (CHK)

Conducts final check of the measuring condition and checks whether or not A/D conversion is available. Before starting the A/D conversion, do not forget to conduct this command.

- Command: CHK
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	CHK	char	3
Total number of transferred bytes				3

- Response data: 4 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Measuring condition check results (*1)	DWORD	4
Total number of response data bytes				5

(*1) Measuring condition check results

Measuring condition check results is defined with 32-bit numeric value as shown in the following table. If the check results are other than '0x00000000,' starting the A/D conversion is not available.

Results (Bit)	Contents
0x00000000	Check results are OK and starting the A/D conversion is available.
0x00000001	CH condition error
0x00000002	CAN condition error
0x00000004	Data file name or file No. error
0x00000008	Interval measurement condition error
0x00000010	Analog trigger measurement condition error
0x00000020	External trigger measurement condition error
0x00000040	Complex trigger condition error
0x00000080	Sampling frequency error
0x00000100	Lacking in CF card remaining capacity
0x00000200	CF card is not inserted
0x00000400	Monitor data output condition error
0x00000800	DPM card error (Different type of DMP card is mixedly installed.)
0x00001000	No measurement target exists.
0x80000000	Checking parameter

MEMO

- When starting A/D conversion is available, 'A/D start enable' bit of the EDX status is set to enable monitoring or various measuring operations. (See "5-3 EDX STATUS.")

NOTE

- When the CHK command is issued to synchronous master EDX, all the synchronous connected EDX statuses are checked and OR value of the all the EDX checked results is set on the Check result. That is to say, unless check results of all the synchronous connected EDX are OK, starting the A/D conversion is not available.
- Even in synchronous operation, conduct final check of measuring condition for every EDX by the PC.
  At this time, check the slave EDX ahead of others and check the master EDX at the end.
- With the stand-alone and synchronous master, when many recorded data files exist in the CF card, the EDX takes some time to answer the command. Because when executing the command, the EDX is checking whether the data file names in the CF card are overlapping. The more files the CF card stores, the more time it will take to process.
  Therefore, when creating multiple files in the CF card, we recommend you to collect data early and delete files in the CF card or replace the CF card with a new one.
- Regarding measuring condition, when file overwrite check is set for the overall information, if it is set to '1' (No), file overwrite check is not conducted. (See "8-1 MEASURING CONDITION FILE FORMAT.")

7-3-5 Initializing Measuring Condition (INI)

Initializes previously set measuring conditions in the EDX and TCP/IP related set values to be returned to the factory default.

Initializes all items such as measuring condition, user's units, KS2 created languages, etc.

- Command: INI
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 4 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	INI	char	3
2	Parameter 1	Initialization mode 0: Initializes measuring condition, user's unit, etc. (TCP/IP related conditions are not initialized.) 1: All the conditions are initialized to factory default. Since the TCP/IP related conditions are also initialized, after receiving the response data, communication may not be available.	BYTE	1
Total number of transferred bytes				4

- Response data: Standard type (1 byte)

- Remarks: After sending the INI command, the EDX is in the following status.

Measuring condition

Measuring mode:	Manual measurement
Sampling frequency:	1 kHz
The number of recorded data:	0 (Data is recorded until stopped)
The number of recording CHs:	Measure all the recording available CH
CH condition:	Default value (*1) for every card
File name:	TEST
File No.:	0
User's unit:	" " (Clear)
KS2 language:	Japanese
Beep alarm sound when data exceeded:	OFF
Operation (Beep) sound:	ON (High pitch sound)
File overwrite check:	0 (Yes)
Re-start A/D conversion after recording is finished:	0 (Yes)

Set TCP/IP related condition (Initialization mode = 1)

- IP address 192.168.100.100
- Subnet mask 255.255.255.0
- Default gateway 0.0.0.0

(*1) For default value for every card, see “10-2 SET VALUE OF CONDITIONER CARD.”

NOTE

- Changing the current date and time is not available with this command.
- Since final check of measuring condition is not conducted by this command, check by conducting the CHK command before A/D conversion.

7-3-6 Setting/Reading Measuring Condition (MES)

Sets and reads measuring conditions together at the same time.

- Command: MES
- Target EDX: Stand-alone, synchronous master, synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 19704 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	MES	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x01	BYTE	1
3	Parameter 2	Measuring condition to be set in the EDX	----	19700
Total number of transferred bytes				19704

- Response data: Standard type (1 byte)

♦♦♦When reading ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	MES	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
Total number of transferred bytes				4

- Response data: 19700 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Measuring condition set in the EDX	----	19700
Total number of transferred bytes				19700

MEMO

• Format of Parameter 2 when setting conditions and Response data 1 when reading data are in common with measuring condition parameter file. For details, see “8. MEASURING CONDITION FILE.”

7-3-7 Starting A/D Conversion (STA)

Starts A/D conversion and moves to monitoring status.

- Command: STA
- Target EDX: Stand-alone and synchronous master

- The number of transferred bytes: 3 bytes
- Parameter: None.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	STA	char	3
Total number of transferred bytes				3

- Response data: Standard type(1 byte)

MEMO

• To conduct this command, A/D conversion available status is required.

7-3-8 Starting Recording (REC)

Starts data recording

For manual measurement mode: If it is during monitoring, the first recording operation starts.
If recording is temporarily stopping, recording operation re-starts.
Trigger measurement mode: Waiting for the first trigger
Interval measurement mode: Waiting for the first interval measurement

- Command: REC
- Target EDX: Stand-alone and synchronous master

- The number of transferred bytes: 3 bytes
- Parameter: None.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	REC	char	3
Total number of transferred bytes				3

- Response data: Standard type (1 byte)

MEMO

• This command is only enabled during monitoring or during temporarily stopping the recording.

7-3-9 Stopping A/D Conversion & Recording (STP)

Stops A/D conversion or data recording.

Depending on the EDX operating status, EDX status varies after sending the STP command.

• When the EDX is recording data or temporarily stopping the data recording:
The recording ends and becomes in monitoring status.
(→ See MEMO.)

• When the EDX is during monitoring data: Stops A/D conversion.

• When the EDX is in the "waiting for trigger measurements" status:
Ends the "waiting for trigger measurements" status and moves to the monitoring status.

• When the EDX is in the "waiting for interval measurements" status:
Ends the "waiting for interval measurements" status and moves to the monitoring status.

- Command: STP
- Target EDX: Stand-alone and synchronous master

- The number of transferred bytes: 3 bytes
- Parameter: None.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	STP	char	3
Total number of transferred bytes				3

- Response data: Standard type(1 byte)

MEMO

• When “After recording, restart the A/D conversion,” in ‘Overall information’ of Measuring condition is set to 1 (No), the EDX is not moved to the monitoring status and A/D conversion is in stopped status.
For measuring condition, see “8-1 MEASURING CONDITION FILE FORMAT.”

NOTE

• In some cases, when the STP command is issued just after data recording of the specified number of data is finished (or during end process), the command may be ignored. After conducting the STP command, check the EDX status. And re-conduct the STP command, if required.

7-3-10 Temporarily Stopping Data Recording (PAU)

Temporarily stops data recording in manual measurement mode.

- Command: PAU
- Target EDX: Stand-alone and synchronous master

- The number of transferred bytes: 3 bytes
- Parameter: None.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	PAU	char	3
Total number of transferred bytes				3

- Response data: Standard type(1 byte)

MEMO

• This command is only enabled during data recording in manual measurement mode.

7-3-11 Conducting and Stopping CAL/Over reset (CAL)

Outputs the CAL value, stops outputting the CAL value, and resets the over status during the A/D conversion.

For setting the CAL target CH, use the MES command or SCC command.

- Command: CAL
- Target EDX: Stand-alone and synchronous master

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	CAL	char	3
2	Parameter 1	CAL conducting status (0: OFF, 1: +CAL, 2: -CAL, 3: Over reset)	BYTE	1
Total number of transferred bytes				4

- Response data: Standard type (1 byte)

MEMO

- It is required to set CAL value output target CH and CAL value in advance.
- For setting the CAL target CH, use the MES command or SCC command.
- Regardless of the target channels, the over reset is executed all channels at the same time.

7-3-12 Conducting Balance and Reading Balance Result (BAL)

Conducts balance, internal sensitivity compensation, initializes internal sensitivity compensation results and obtains the results of the said operations.

To conduct this command, it is required to set a target CH in advance.

To set the balance target CH, use the MES command or SBC command.

To set the internal sensitivity compensation target CH, use the MES command.

- Command: BAL
- Target EDX: Stand-alone and synchronous master

♦♦♦When conducting ♦♦♦

- The number of transferred bytes: 5 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	BAL	char	3
2	Parameter 1	Balance conducting mode (0x00: Read BAL results, 0x01: Conduct) Set 0x01.	BYTE	1
3	Parameter 2	Balance conducting mode 0: Conducting balance. 1: Conducting internal sensitivity compensation 2: Initializing internal sensitivity compensation results	BYTE	1
Total number of transferred bytes				5

- Response data: Standard type (1 byte)

- Remarks: After executing the BAL command, use the status read command to check the EDX status and after checking that the balance/internal sensitivity compensation is finished, read the checked results.

♦♦♦When reading the results ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	BAL	char	3
2	Parameter 1	Balance conducting mode (0x00: Read BAL results, 0x01: Conduct) Set 0x00.	BYTE	1
Total number of transferred bytes				4

- Response data: 256 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Balance/internal sensitivity compensation results Regardless of connection and setting statuses, outputs the results of 32 CHs × 8 EDX units. 1 byte × 32 CHs × 8 = 256 bytes -1: No card or no function 0: OK 1 NG 2: OFF	Char × 256	256
Total number of response data bytes				256

NOTE

- While conducting balance/internal sensitivity compensation, no commands are enabled other than status read command.

7-3-13 Obtaining Monitor Data (GMD)

Obtains monitor data.

For obtaining the monitor data, it is required to set the SMD command in advance.

- Command: GMD
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When conducting ♦♦♦

- The number of transferred bytes: 7 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	GMD	char	3
2	Parameter 1	The number of monitor data per CH Note that set value varies with monitor data output mode of the SMD command. • Continuous monitor data output mode Set '0' to the master EDX. For the slave EDX, set the number of data per CH obtained from the master EDX. • Intermittent monitor data output mode. Set the number of data per CH. *Special usage When setting "0xFFFFFFFF" or "0xFFFFFFFE" in the parameter, the EDX-100A operates as follows. 0xFFFFFFFF: Clear the " Discontinuous monitor data" status. 0xFFFFFFFE: Request the response without monitor data.	DWORD	4
Total number of transferred bytes				7

- Response data: Monitor data (The number of bytes varies with setting of SMD command, the number of measuring CHs, and command executing timing.)

MEMO

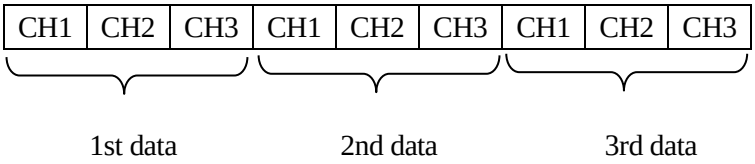
• For how to obtain the monitor data, see also "7-3-2 Setting/Reading Monitor Data Output Condition (SMD)"

- Monitor data assignment

  For analog CH, monitor data is 2 bytes per CH.

  The monitor data of one sampling is assigned in due order from analog CH1, CH2, and CH3.

  Ex.) When monitor data of CHs 1, 2, and 3 are measured 3 times.



- When monitor data output mode of the SMD command is 0 to 2 in synchronous operation
  For obtaining the monitor data in synchronous operation, firstly obtain the monitor data of the master EDX and then, obtain the monitor data of the slave EDX. For the master EDX, the general method is used for sending the GMD command. However, for the slave EDX, the GMD command is sent by the following method.
  1) Receives response data (Monitor data) after sending the GMD command to the master EDX.
  2) When receiving the response data, monitor data point value of header information is temporarily stored.
  3) Substitutes the monitor data point stored in the header information (Item 2)) when the GMD command is sent to the slave EDX. If abnormal value is specified for the monitor data point, the slave EDX returns only the header (the number of Response data bytes = 0).
  4) Receives the response data (Monitor data) of the GMD command.
     The above monitor data is synchronizing with the monitor data of the master EDX.

- When monitor data output mode of the SMD command is -1
  If GMD command is conducted in the above status, only header (The number of response data bytes: 0) is returned.

- When monitor data is received, if the EDX status is in 'Monitor data becomes discontinuous' status
  If the GMD command is conducted in the above status, only header (The number of response data bytes: 0) is returned.
  After sending the 'Monitor data becomes discontinuous' status to the PC, the 'Monitor data becomes discontinuous' status is cleared.

- When recording data of the file No. 9999 is finished
  Since the file No. has reached the maximum value, it is not available to continue data recording. Therefore, A/D conversion available bit of the EDX status is set to '0' and return value of the GMD command shall be '-3.' To conduct the A/D conversion once again, it is required to change the file name.

MEMO

- Monitor data of the EDX is sent to the PC through internal FIFO memory.
  While setting the continuous monitor output mode, to obtain the continuous data by the PC, before the FIFO memory becomes full, it is required to continuously obtain the monitor data by using the GMD command. If the FIFO memory becomes full, the EDX status 'Monitor data becomes discontinuous' is set to have the monitor data in discontinuous state.

- With 'Monitor data becomes discontinuous' state set in the EDX, no new monitor data is stored in the FIFO memory. If the 'Monitor data becomes discontinuous' state is cleared, data in the FIFO memory is also cleared to newly store the monitor data.

- Maximum storage time of the FIFO memory can be roughly calculated by the following expression.

  FIFO storage available time [sec] =
  1048576/([Number of Measurement ON CHs] × Sampling frequency [Hz])

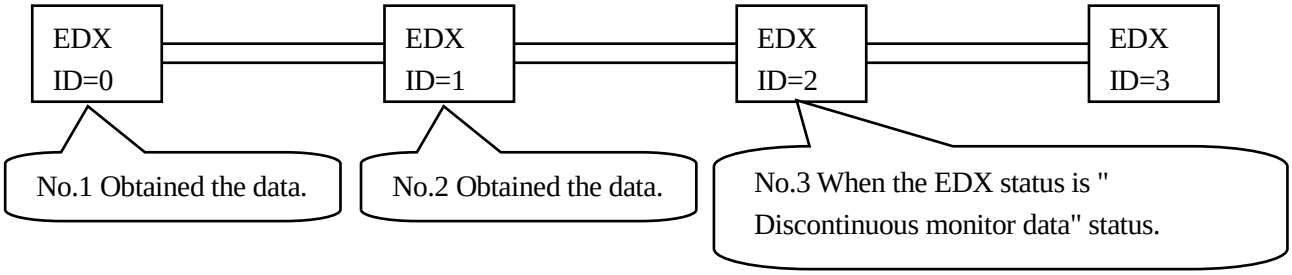
  Ex.) Assume that the number of measuring CHs is 32 and sampling frequency is 5 kHz
  1048576/(32*5000) = Approx. 6.55 [sec]

- When the EDX status is “Discontinuous monitor data" status.

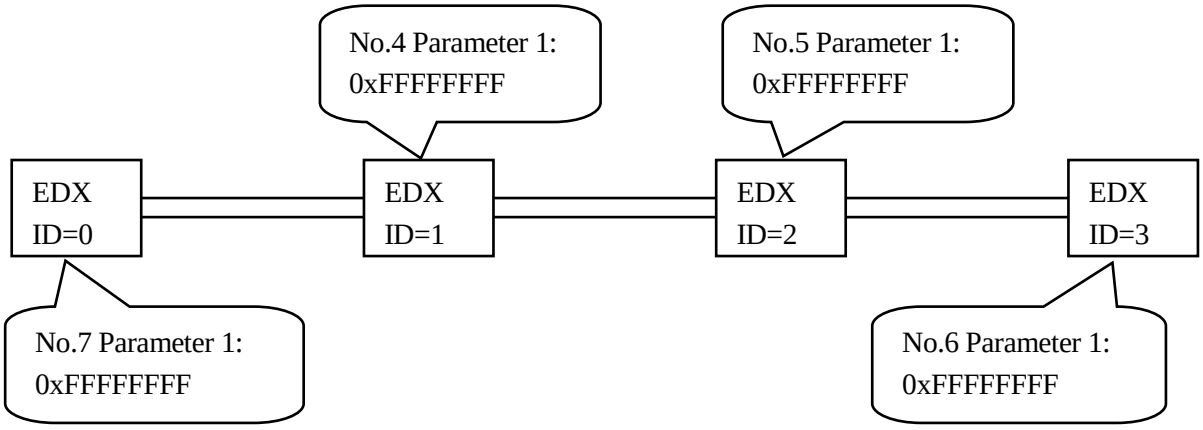
  When the EDX status is “Discontinuous monitor data" status at executing the GMD command, the response data of the GMD command is header section only (no monitor data).
  Later, the “Discontinuous monitor data" status will be cleared for outputting the monitor data again.
  In synchronous operation, when an EDX status is ‘Discontinuous monitor data’ status, the synchronous monitor data of every unit will not be obtained. At that time, set the parameter1 "0xFFFFFFFF" and send the GMD command to all slave units. Then, set the parameter1 "0xFFFFFFFF" and send the GMD command to the master unit.
  After then, obtain the monitor data from the master unit to slave units again. You will obtain the synchronous monitor data of every unit.

[Example]
Synchronous operation: 4 units
Slave EDX (ID=2) status is “Discontinuous monitor data" status.

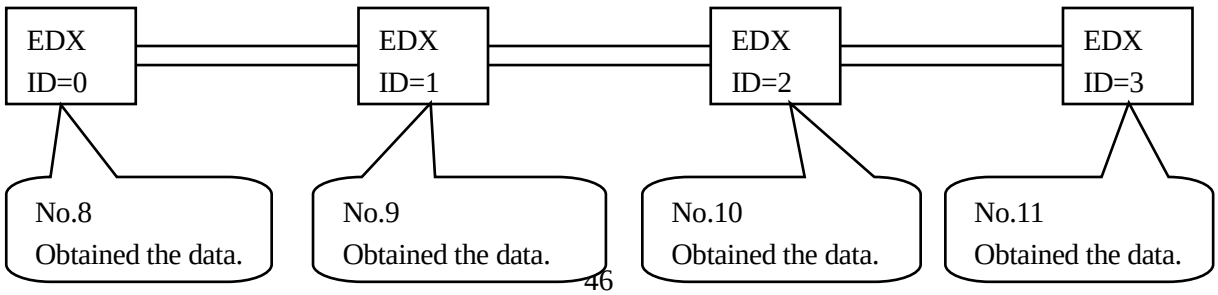
1. When obtaining the monitor data from the master unit to slave units (No.1, 2), the slave EDX (ID=2) status is " Discontinuous monitor data" status (No.3).



2. Set the parameter1 "0xFFFFFFFF" and send the GMD command to all slave units (No.4,5,6).
   Then, set the parameter1 "0xFFFFFFFF" and send the GMD command to the master unit (No.7).



3. Obtain the monitor data from the master unit to slave units again (No.8,9,10,11).
   You will obtain the synchronous monitor data of every unit.



7-3-14 Setting/Reading Keylock Status (LOC)

Locks operation keys and reads the key status on the front panel.

- Command: LOC
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 8 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	LOC	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x01.	BYTE	1
3	Parameter 2	Keylock status (1: Enabled, 0: Disabled) (0x01: REC/PAUSE, 0x02: STOP, 0x04: BAL, 0x08: READ)	BYTE	1
4	Parameter 3	Reserved	char	3
The number of transferred bytes				8

- Response data: Standard type (1 byte)

♦♦♦When reading ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

Contents	Name	Contents	Types of Variables	The Number of Bytes
1	Command	LOC	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
The number of transferred bytes				4

- Response data: 4 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Keylock status (1: Enabled, 0: Disabled) (0x01: REC/PAUSE, 0x02: STOP, 0x04: BAL, 0x08: READ)	BYTE	1
2	Response data 2	Reserved	char	3
The number of transferred bytes				4

MEMO

- When connection with the PC is disconnected or the EDX is re-started, the current setting keylock status is cleared.
- For synchronous slave, keylock setting of REC/PAUSE and STOP keys are ignored. (Always in kyelock status.)

7-3-15 Reading EDX Status

Generally, since the EDX status is stored in the header section of the Response packet, the EDX status can be obtained by conducting any command and by referring to the header section of the Response packet.

However, when it is required to check the EDX status before issuing the command to the EDX or when the next command cannot be issued unless after checking whether or not processing requiring a certain time in the EDX is surely finished, it is required to obtain the EDX status.

In the above cases, when only the header section of the Command packet (Addition data size: 0) is sent to the EDX, the Response packet only storing the header section is returned. After checking the status items of the Response packet header section, the EDX status can be obtained.

- Command: None
- Target EDX: Stand-alone, synchronous master, and synchronous slave
- The number of transferred bytes: 0 byte
- Parameter: None
- Response data: 0 byte

7-3-16 Setting/Reading Time (TIM)

Sets and reads date and time.

- Command: TIM
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 12 bytes
- Parameter: See the following table.

No.	Name	Contents		Types of Variables	The Number of Bytes
1	Command	TIM		char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x01.		BYTE	1
3	Parameter 2	Date	Year (2006 to 2099)	WORD	2
			Month (1 to 12)	BYTE	1
			Day (1 to 31)	BYTE	1
			Hour (0 to 23)	BYTE	1
			Minute (0 to 59)	BYTE	1
			Second (0 to 59)	BYTE	1
4	Parameter 3	Reserved		char	1
The number of transferred bytes					12

- Response data: Standard type (1 byte)

♦♦♦When reading ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	TIM	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
The number of transferred bytes				4

- Response data: 8 bytes

No.	Name	Contents		Types of Variables	The Number of Bytes
1	Response data 1	Date	Year (2006 to 2099)	WORD	2
			Month (1 to 12)	BYTE	1
			Day (1 to 31)	BYTE	1
			Hour (0 to 23)	BYTE	1
			Minute (1 to 59)	BYTE	1
			Second (0 to 59)	BYTE	1
2	Response data 2	Reserved		char	1
The number of transferred bytes					8

MEMO

Although time can be set for synchronous slave, when starting the measurement by synchronous operation, the time can be automatically set to the time of the synchronous master.

7-3-17 Setting/Reading TCP/IP Information (NET)

Sets and reads IP address, subnet mask, and default gateway of the EDX.

- Command: NET
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 56 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	NET	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x01.	BYTE	1
3	Parameter 2	IP Address (Ex: 192. 168. 100. 100)	char	16
4	Parameter 3	Subnet Mask (Ex: 255. 255. 255. 0)	char	16
5	Parameter 4	Default Gateway (Ex: 0. 0. 0. 0)	char	16
6	Parameter 5	Reserved (0x00 fixed)	BYTE	1
7	Parameter 6	Reserved	char	3
The number of transferred bytes				56

- Response data: Standard type (1 byte)

♦♦♦When Reading ♦♦♦

- The number of transferred bytes: 4 bytes

Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	NET	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
The number of transferred bytes				4

- Response data: 52 bytes

No.	Name	Contents	Types of Variables	Number of Bytes
1	Response data 1	IP Address (Ex: 192. 168. 100. 100)	char	16
2	Response data 2	Subnet Mask (Ex. 255. 255. 255. 0)	char	16
3	Response data 3	Default Gateway (Ex.: 0. 0. 0. 0)	char	16
4	Response data 4	Reserved	char	4
The number of transferred bytes				52

MEMO

• When setting TCP/IP information with this command, setting contents are only saved in the non-volatile memory in the EDX and changed contents are not immediately reflected in the EDX. The changed contents are reflected when the power is started up the next time.

7-3-18 Reading System Information (SYS)

Reads system information of the EDX.

- Command: SYS
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SYS	char	3
2	Parameter 1	Read mode 0: Device configuration 1: Card information + Hardware version	BYTE	1
The number of transferred bytes				4

- Read mode = 0
- Response data: 56 bytes

No.	Name	Contents		Types of Variables	The Number of Bytes
1	Response data 1	Model		char	20
2	Response data 2	Software version		char	20
3	Response data 3	Card type	Slot 1	BYTE	1
			Slot 2	BYTE	1
			Slot 3	BYTE	1
			Slot 4	BYTE	1
4	Response data 4	Reserved		char	4
4	Response data 5	Chassis size (8, 16, and 32)		BYTE	1
5	Response data 6	Device ID No.		char	1
6	Response data 7	Parameter file version		WORD	2
6	Response data 8	Reserved		char	4
The number of transferred bytes					56

- Read mode = 1
- Response data: 1360 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Slot 1 conditioner card information	char	68
·	·	·	char	68
4	Response data 4	Slot 4 conditioner card information	char	68
5	Response data 5	Reserved (68 bytes × 6 = 408 bytes)	char	408
6	Response data 6	Hardware information 1	char	68
·	·	·	·	·
15	Response data 15	Hardware information 10	char	68
Total number of response data bytes				1360

NOTE

- All the response data 1 to 15 in read mode = 1 is character string.
  Note that display contents may be changed without prior notice.

7-3-19 Reading Card Information (CAD)

Reads property value of conditioner cards installed in the EDX.

The property value includes various information such as card type Nos., settable mode, and range as well as values and corresponding character strings, etc.

- Command: CAD
- Target EDX: Stand-alone, synchronous master, and synchronous slave

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	CAD	char	3
2	Parameter 1	Language of obtaining character string (0: Japanese, 1: English)	BYTE	1
The number of transferred bytes				4

NOTE

- Only card type No. is enabled for CAN-40A and CAN-41A.

- Response data: 11600 bytes

No.	Name	Contents			Types of Variables	The Number of Bytes
1	Response data 1	Slot1	Model name		char	20
			Card type No.		BYTE	1
			The number of modes		BYTE	1
			The number of high pass filters		BYTE	1
			The number of low pass filters		BYTE	1
			The number of ranges (For 8 modes)		BYTE	8
			The number of CALs (For 8 modes)		BYTE	8
			Mode character string (1 item/12 bytes × 8 = 96		char	96
			Range character string 1 item: 12 bytes 14 items for each mode (12 bytes × 14=168)	Mode No.1	char	168
				Mode No.2	char	168
				Mode No.3	char	168
				Mode No.4	char	168
				Mode No.5	char	168
				Mode No.6	char	168
				Mode No.7	char	168
				Mode No.8	char	168
			High pass filter character string (1 item/12 bytes × 3 = 36)		char	36
			Low pass filter character string (1 item/12 bytes × 10 = 120)		char	120
			CAL character string 1 item: 12 bytes 8 items for each mode (12 bytes × 8 = 96)	Mode No.1	char	96
				Mode No.2	char	96
				Mode No.3	char	96
				Mode No.4	char	96
				Mode No.5	char	96
				Mode No.6	char	96
				Mode No.7	char	96
				Mode No.8	char	96
			Range value (float: 4 bytes) 14 ranges for each mode (4 bytes × 14 = 56)	Mode No.1	float	56
				Mode No.2	float	56
				Mode No.3	float	56
				Mode No.4	float	56
				Mode No.5	float	56
				Mode No.6	float	56
				Mode No.7	float	56
				Mode No.8	float	56
			Low pass filter value (float: 4 bytes × 10 = 40)		float	40
			Range unit No. (8)		BYTE	8
			Slot 1 Total number of bytes			2900
			.			.
			Slot 4 total number of bytes			2900
Total number of response data bytes						11600

7-3-20 Obtaining CF Card Remaining Capacity (FFR)

Checks remaining capacity of the CF card.

- Command: FFR
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3 bytes
- Parameter: None

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FFR	char	3
The number of transferred bytes				3

- Response data 16 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Remaining capacity of CF card	INT64	8
1	Response data 2	The whole capacity of the CF card	INT64	8
The number of transferred data				16

MEMO

• Since remaining capacity of the CF card is a value obtained by subtracting system reserve area (Approx. 4 Mbytes), it shall be a value smaller than a value indicated on the PC.

7-3-21 Opening File (FOF)

Opens read or write file.

NOTE

- A target file is a data file with extension 'KS2' in data folder "EDX100A" of the CF card.

- Command: FOF
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 48 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FOF	char	3
2	Parameter 1	Open mode (0: Read)	BYTE	1
3	Parameter 2	File name (40 characters) Extension is KS2 fixed. Do not add the extension. Ex.) For TESTT0000.KS2, set the file name as TEST0000.	char	44
The number of transferred bytes				48

- Response data: 2 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	File open results (0: Normally ended, -1: Error)	short	2
Total number of response data bytes				2

- Remarks: When file open results of the response data is '0' (Normally ended), the EDX status shall be "During opening file by control command." At this time conducting available commands are only FRF, FSF, and FCF.
  To close the file, conduct the FFC command.

7-3-22 Reading File Data (FRF)

Reads the file data opened by the FOF command

- Command: FRF
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 5 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FRF	char	3
2	Parameter 1	The number of read bytes (Max. 65000 bytes)	WORD	2
The number of transferred bytes				5

- Response data: 4 bytes + The number of read bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	Read results (0: Normally ended, -1: Error) Only when the read results is '0' (Normally ended), values on and after the Response data 2 is enabled.	short	2
2	Response data 2	The number of actually read bytes (The number of bytes of the response data 3)	WORD	2
3	Response data 3	The read data (0 to 65000 bytes data)	---	---
Total number of response data bytes				4 to

MEMO

- Data size that can be read at a time by this command is maximum 65000 bytes. When reading a file with size exceeding the 65000 bytes, repeat this command for the number of required times for reading the file.

7-3-23 Seeking File (FSF)

Changes the file read start position of the file opened by the FOF command.

- Command: FSF
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 12 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FSF	char	3
2	Parameter 1	File read standard position 0: Current file read position 1: File end 2: File head	BYTE	1
3	Parameter 2	Moving amount of file read position	INT64	8
The number of transferred bytes				12

- Response data: 2 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	File seek results (0: Normally ended, -1: Error)	short	2
Total number of response data bytes				2

NOTE

- Although variable type of 'Moving amount of read position' in the above Parameter 2 is INT64 type, the actually specifying available range is limited to long value range (-2,147,483,648 to +2,147,483,647).

7-3-24 Closing File (FCF)

Closes the file opened by the FOF command.

- Command: FCF
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3bytes
- Parameter: None

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FCF	char	3
The number of transferred bytes				3

- Response data: 2 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	File close results (0: Normally ended, -1: Error)	short	2
Total number of response data bytes				2

- Remarks: When file close results of the response data is '0' (Normally ended), EDX status 'During opening file by control command" is cleared.

7-3-25 Deleting File (FDF)

Deletes the file.

NOTE

- The target file is a data file with extension 'KS2' in data folder "EDX100A" of the CF card.

- Command: FDF
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3bytes
- Parameter: None

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FDF	char	3
2	Parameter 1	File name to be deleted Since extension 'KS2" is fixed. Do not add any extension. Ex.)When deleting the TEST000.KS2, set the file name as TEST000.	char	44
The number of transferred bytes				47

- Response data: 2 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	File delete setting results (0: Normally ended, -1: Error)	short	2
Total number of response data bytes				2

- Remarks: Before file delete is completed, this command sends the response data from the EDX to the PC.
  While deleting the desired file, 'CF card accessing (Busy)' of the EDX status is set. Whether or not the file delete is completed can be checked by clearing the 'CF card accessing (Busy).'
  In addition, if the 'CF card accessing (Busy)' is set, sending any commands is not available except reading status.

7-3-26 Starting Finding File (FFF)

Starts finding the desired file.

NOTE

• The target file is a data file with extension 'KS2' in data folder "EDX100A" of the CF card.

- Command: FFF
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 47bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FFF	char	3
2	Parameter 1	Desired file name to be found Since extension 'KS2" is fixed. Do not add any extension.	char	44
The number of transferred bytes				47

- Response data: 68 bytes

No.	Name	Contents			Types of Variables	The Number of Bytes
1	Response data 1	File find results (0: Normally ended, -1: Error or no file) Only when the file find results is '0' (Normally ended), the Response data 3 is enabled.			short	2
2	Response data 2	Reserved			char	2
3	Response data 3	File information	File name (With extension)		char	48
			File size		INT64	8
			File created date	Year (2006 to)	WORD	2
				Month (1 to 12)	BYTE	1
				Day (1 to 31)	BYTE	1
				Hour (0 to 23)	BYTE	1
				Minute (0 to 59)	BYTE	1
				Second (0 to 59)	BYTE	1
				Reserved	char	1
Total number of Response data bytes						68

- Remarks: When file find results of the response data is '0' (Normally ended), the EDX status becomes "Finding file by control command." At this time, only FFN and FFC commands are enabled.
  When ending the finding file command, conduct the FFC command.

MEMO

• Question mark (?) or asterisk (*) can be specified to the file name that is found by the Parameter 1.
  Question mark '?' is an arbitrary 1-byte character and '*,' an arbitrary character string.
(No need to specify ' ' in the quotation.)

Ex.1 When finding all the files.
Specify '*' to the Parameter 1.

Ex. 2 When finding all the files with character string "TEST" at the head.
Specify "TEST*" to the Parameter 1.

Ex. 3 When finding all the files with analog trigger of synchronous operation master (ID=0) conducted.
Specify "*_A*_0" to Parameter 1.

Ex. 4 When start finding files with file names "TEST" and file Nos. from 20 to 29.
Specify "TEST002?" to the Parameter 1.

7-3-27 Continuing Finding File (FFN)

Continues finding the file next to the file started by the FFF command.

- Command: FFN
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3 bytes
- Parameter: None

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FFN	char	3
The number of transferred bytes				3

- Response data: 68 bytes

No.	Name	Contents			Types of Variables	The Number of Bytes
1	Response data 1	File find results (0: Normally ended, -1: Error or no file) Only when the file find is normally ended, Response data 3 is enabled.			short	2
2	Response data 2	Reserved			char	2
3	Response data 3	File information	File name (With extension)		char	48
			File size		INT64	8
			File created date	Year (2006 to)	WORD	2
				Month (1 to 12)	BYTE	1
				Day (1 to 31)	BYTE	1
				Hour (0 to 23)	BYTE	1
				Minute (0 to 59)	BYTE	1
				Second (0 to 59)	BYTE	1
				Reserved	char	1
Total number of Response data bytes						68

- Remarks: When file find result of the Response data is '-1' (Error or no file), the EDX status "Finding file by control command" is cleared.

7-3-28 Ending Finding File (FFC)

Ends finding the file started by the FFF command

- Command: FFC
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	FFC	char	3
The number of transferred bytes				3

- Response data: 2 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	File find end results (0: Normally ended, -1: Error)	short	2
Total number of response data bytes				2

- Remarks: When file find results of the Response data is ‘0’ (Normally ended), the EDX status “Finding file by control command” is cleared.

7-3-29 Setting/Reading Balance Target CH (SBC)

Sets/Reads balance target CH.

- Command: SBC
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 36 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SBC	char	3
2	Parameter 1	Operation mode (0x00: Read, 0x01: Set) Set 0x01.	BYTE	1
3	Parameter 2	Balance conducting status of CHs (For 32 CHs 0: OFF, 1: ON) (The head byte is CH1.)	BYTE	32
The number of transferred bytes				33

- Response data: Standard type (1 byte)

♦♦♦When reading ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SBC	short	3
	Parameter 1	Operation mode (0x00: Read, 0x01: Set) Set 0x00.		1
Total number of transferred bytes				4

- Response data: 32 bytes
  Balance conducting status of CHs (0: OFF, 1: ON)

MEMO

• When setting Parameter 2 and when reading the response data, arrangement of 32 bytes shall be in due order from CH1, CH2, ….CH32 starting from the head byte.

7-3-30 Setting/Reading CAL Target CH (SCC)

Sets/reads CAL target CH.

- Command: SCC
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting ♦♦♦

- The number of transferred bytes: 36 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SCC	char	3
2	Parameter 1	Operation mode (0x00: Read, 0x01: Set) Set 0x01.	BYTE	1
3	Parameter 2	CAL ON/OFF status of CHs (For 32 CHs 0: OFF, 1: ON) (The head byte is CH1.)	BYTE	32
The number of transferred bytes				36

- Response data: Standard type (1 byte)

- Remarks: To be error if data is sent during CAL output.

♦♦♦When reading ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	SCC	char	3
2	Parameter 1	Operation mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
Total number of response data bytes				4

- Response data: 32 bytes
  CAL ON/OFF status of CHs (0: OFF, 1: ON)

MEMO

• When setting Parameter 2 and when reading the response data, arrangement of 32 bytes shall be in due order from CH1, CH2, ….CH32 starting from the head byte..

7-3-31 Measuring/Obtaining Average Value (AVG)

Measures analog CHs of measurement target with 1 kHz sampling frequency and obtains the average value.

- Command: AVG
- Target EDX: Stand-alone and synchronous master

♦♦♦When conducting ♦♦♦

- The number of transferred bytes: 5 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	AVG	char	3
2	Parameter 1	Average value measurement mode (0x00: Read results, 0x01: Conduct) Set 0x01.	BYTE	1
3	Parameter 2	Average value obtaining time (sec) 0 to 10 Set '0' to obtain the average data of approx. 1 second.	BYTE	1
The number of transferred bytes				5

- Response data: Standard type (1 byte)
- Remarks: After conducting the AVG command, check the EDX status with the status read command. After confirming that the average value measurement is finished, read the results.

♦♦♦When reading the results ♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the following table.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command	AVG	char	3
2	Parameter 1	Average value measurement mode (0x00: Read results, 0x01: Conduct) Set 0x00.	BYTE	1
The number of transferred bytes				4

- Response data: 512 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	A/D conversion average value of measured CHs Regardless of whether or not CHs are measured, measured results are output for 32 CHs × 8 EDX units. 2 bytes data×32 CHs×8 EDX units = 512 bytes Data of not measured CH shall be '0.'	short × 256 CHs	512
Total number of response data bytes				512

NOTE

- Conducting this command is only available when A/D conversion is stopping in A/D conversion enabled status.
- While measuring the average value, no command other than reading the status is available.

7-3-32 Reading TEDS Information (TED)

Read TEDS information of 32 CHs together at the same time.

MEMO

- For details of TEDS, refer to IEE 1451.4 standard.

- Command: TEDS
- Target EDX: Stand-alone, synchronous master, and synchronous slave

- The number of transferred bytes: 3 bytes

No.	Name	Contents	Types of Variables	The Number of Bytes
1		TED	char	3
The number of transferred bytes				3

- Parameter: None

- Response data: 21120 bytes

No.	Name	Contents		Types of Variables	The Number of Bytes
1	Response data 1	Template ID No. (*1)		BYTE	1
		Validity of Template ID No. (0: Invalid, 1: Valid) (*2)		BYTE	1
		Reserved		char	2
		Basic information (*3)	Unique Registration Number	INT64	8
			Manufacture ID	WORD	2
			Model Number	WORD	2
			Version Letter	char	2
			Version Number	WORD	2
			Serial Number	DWORD	4
		Standard information (*4)		char	100
		User's data	User's data 1	char	32
			User's data 2	char	480
			Available size	DWORD	4
		Reserved		char	20
		Total of CH1 TEDS information			660
		.			.
		Total of CH32 TEDS information			660
Total number of response data bytes					21120

(*1) Template ID No.

• Template ID No. and “SubID” are Identification Nos. originally defined by the EDX. (See the following table.)

• “Standard Template ID No.” in the following table is relevant to Template ID No. defined by IEEE1451.4 standard.

Template ID No.	Contents
0	No card is installed or no information
1	Not applicable TEDS information
2	Standard Template ID = 0, Sub ID = 0
3	Standard Template ID = 24, Sub ID = 0
4	Standard Template ID = 25, Sub ID = 0
5	Standard Template ID = 25, Sub ID = 1
6	Standard Template ID = 30, Sub ID = 0
7	Standard Template ID = 30, Sub ID = 1
8	Standard Template ID = 33, Sub ID = 0
9	Standard Template ID = 36, Sub ID = 0

(*2) Validity of Template ID No

Flag to indicate whether standard information is valid.

(*3) Basic Information

Valid only when the template ID No. is more than 2.

(*4) Standard Information

Contents of the standard information and the number of bytes varies with the template ID No.

(Valid only when the template ID No. is more than 2.)

Contents of the standard information is described in the following table for every template ID No.

(Written as described in IEEE1451.4 standard.)

Template ID No.	Contents	Types of Variables	The Number of Bytes
2	Standard Template ID	BYTE	1
	Polarity (sign) (0: Positive,1: Negative)	BYTE	1
	Sensitivity direction (0: X, 1: Y, 2: Z, 3: N/A)	BYTE	1
	Reserved	char	1
	Calibration Date (e. g. “2005/01/01”)	char	16
	Sensitivity @ reference condition [V/(m/s^2)]	float	4
	Reference frequency [Hz]	float	4
	High-pass cut-off frequency(F hp) [Hz]	float	4
	Measurement location ID (0 to 511)	WORD	2
	Reserved	char	2
	Total of Template ID No. 2		36

Template ID No.	Contents	Types of Variables	The Number of Bytes
3	Standard Template ID	BYTE	1
	Polarity (sign) (0: Positive,1: Negative)	BYTE	1
	Sensitivity direction (0: X, 1: Y, 2: Z, 3: N/A)	BYTE	1
	Reserved	char	1
	Sensitivity @ reference condition [V/(ms^2)]	float	4
	Reference frequency [Hz]	float	4
	High-pass cut-off frequency [Hz]	float	4
	Low-pass cut-off frequency [Hz]	float	4
	Resonance frequency (fres) [Hz]	float	4
	Quality factor at fres	float	4
	Amplitude slope (a) [%/decade]	float	4
	Temperature Coefficient (b) [%/℃]	float	4
	Reference temperature [℃]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Measurement location ID (0 to 2047)	WORD	2
	Reserved	char	2
	Total of Template ID No. 3		60
4	Standard Template ID	BYTE	1
	Sensitivity direction (0: X, 1: Y, 2: Z, 3: N/A)	BYTE	1
	Transducer Electrical Signal Type (0: Voltage Sensor)	BYTE	1
	Mapping Method(0: Linear)	BYTE	1
	AC or DC coupling (0: DC, 1: AC, 1 = fixed)	BYTE	1
	Polarity (sign) (0: Positive,1: Negative)	BYTE	1
	Reserved	char	2
	Sensitivity @ reference condition [V/(ms^2)]	float	4
	High-pass cut-off frequency [Hz]	float	4
	Transducer weight [g]	float	4
	Reference frequency [Hz]	float	4
	Reference temperature [℃]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Calibration Initials (Max 3chrs. e. g. “TK”)	char	4
	Calibration period [days]	WORD	2
	Measurement location ID (0 to 2047)	WORD	2
	Total of Template ID No. 4		172

Template ID No.	Contents	Types of Variables	The Number of Bytes
5	Standard Template ID	BYTE	1
	Sensitivity direction (0: X, 1: Y, 2: Z, 3: N/A)	BYTE	1
	Transducer Electrical Signal Type (0: Voltage Sensor)	BYTE	1
	Mapping Method(0: Linear)	BYTE	1
	AC or DC coupling (0: DC, 1: AC)	BYTE	1
	Polarity (sign) (0: Positive,1: Negative)	BYTE	1
	Reserved	char	2
	Sensitivity @ reference condition [V/(ms^2)]	float	4
	High-pass cut-off frequency [Hz]	float	4
	Transducer weight [g]	float	4
	Reference frequency [Hz]	float	4
	Reference temperature [℃]	float	4
	Low-pass cut-off frequency [Hz]	float	4
	Resonance frequency (fres) [Hz]	float	4
	Quality factor at fres	float	4
	Amplitude slope (a) [%/decade]	float	4
	Temperature Coefficient (b) [%/℃e]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Calibration Initials (Max 3chrs. e. g. “TK”)	char	4
	Calibration period [days]	WORD	2
	Measurement location ID (0 to 2047)	WORD	2
	Total of Template ID No. 5		72
6	Standard Template ID	BYTE	1
	Physical Measurand	BYTE	1
	Transducer Electrical Signal Type (0: Voltage Sensor)	BYTE	1
	Full-Scale Electrical Value Precision	BYTE	1
	Mapping Method(0: Linear)	BYTE	1
	AC or DC coupling (0: DC, 1: AC)	BYTE	1
	Reserved	char	2
	Minimum physical value	float	4
	Maximum physical value	float	4
	Minimum voltage output [V]	float	4
	Maximum voltage output [V]	float	4
	Sensor output impedance [ohms]	float	4
	Response Time [sec]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Calibration Initials (Max 3chrs. e. g. “TK”)	char	4
	Calibration period [days]	WORD	2
	Measurement location ID (0 to 2047)	WORD	2
	Total or Template ID No. 6		200

Template ID No.	Contents	Types of Variables	The Number of Bytes
7	Standard Template ID	BYTE	1
	Physical Measurand	BYTE	1
	Power-supply type (0: DC,1: Bipolar DC,2: AC (rms))	BYTE	1
	Transducer Electrical Signal Type (0: Voltage Sensor)	BYTE	1
	Full-Scale Electrical Value Precision	BYTE	1
	Mapping Method(0: Linear)	BYTE	1
	AC or DC coupling (0: DC, 1: AC)	BYTE	1
	Reserved	char	1
	Minimum physical value	float	4
	Maximum physical value	float	4
	Minimum voltage output [V]	float	4
	Maximum voltage output [V]	float	4
	Sensor output impedance [ohms]	float	4
	Response Time [sec]	float	4
	Power-supply level, nominal [V]	float	4
	Power-supply level, min [V]	float	4
	Power-supply level, max [V]	float	4
	Max current at nominal power level [A]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Calibration Initials (Max 3chrs. e. g. “TK”)	char	4
	Calibration period [days]	WORD	2
	Measurement location ID (0 to 2047)	WORD	2
	Total of template ID No. 7		72
8	Standard Template ID	BYTE	1
	Physical Measurand	BYTE	1
	Transducer Electrical Signal Type (3: Bridge Sensor)	BYTE	1
	Full-Scale Electrical Value Precision	BYTE	1
	Mapping Method(0: Linear)	BYTE	1
	Bridge Type (0: QUARTER,1: HALF,2: FULL)	BYTE	1
	Reserved	char	2
	Minimum physical value	float	4
	Maximum physical value	float	4
	Minimum electrical output [V/V]	float	4
	Maximum electrical output [V/V]	float	4
	Bridge element impedance [ohms]	float	4
	Response Time [sec]	float	4
	Excitation level, nominal [V]	float	4
	Excitation level, min [V]	float	4
	Excitation level, max [V]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Calibration Initials (Max 3chrs. e. g. “TK”)	char	4
	Calibration period [days]	WORD	2
	Measurement location ID (0 to 2047)	WORD	2
	Total of template ID No. 8		68

Template ID No.	Contents	Types of Variables	The Number of Bytes
9	Standard Template ID	BYTE	1
	Transducer Electrical Signal Type (0: Voltage Sensor)	BYTE	1
	Mapping Method (4: Thermocouple)	BYTE	1
	Thermocouple type (0 to 8) 0: B type, 1: E Type, 2: J Type, 3: K Type, 4: N Type, 5: R Type, 6: S Type, 7: T Type, 8: Non-standard	BYTE	1
	Cold-junction compensation required (0: CJC required,1: Compensated)	BYTE	1
	Reserved	char	3
	Minimum temperature [˚C]	float	4
	Maximum temperature [˚C]	float	4
	Minimum voltage output [V]	float	4
	Maximum voltage output [V]	float	4
	Thermocouple resistance [ohms]	float	4
	Sensor Response Time [sec]	float	4
	Calibration Date (e. g. “2005/01/01”)	char	16
	Calibration Initials (Max 3chrs. e. g. “TK”)	char	4
	Calibration period [days]	WORD	2
	Measurement location ID (0 to 2047)	WORD	2
	Total of template ID No. 9		56

MEMO

Validity of Basic information, Standard information, and User Data information

(1) When the template ID No. = 0

- The template ID No. is always 0 (Invalid).
- The Basic information is invalid.
- The Standard information is invalid.
- The User Data information is invalid.

(2) When the template ID No. = 1

- The template ID No. is always 0 (Invalid).
- The Basic information is valid.
- The Standard information is invalid.
- The User Data information is invalid.

(3) When the template ID No. >= 2

- The Basic information is valid.
- When the template ID No. is 1 (valid), the Standard information is correct data.
- When the template ID No. is 0 (invalid), the Standard information is not correct or the current sensor does not match the current conditioner card.
- The User Data information is valid only when the Basic information's Manufacture ID is 58 (KYOWA).

7-3-33 Read/write the user data (URW)

Read and write the arbitrary user data.

- Command: URW
- Target EDX: Stand-alone, synchronous master, and synchronous slave

♦♦♦When setting♦♦♦

- The number of transferred bytes: 40 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command Name	URW	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x01.	BYTE	1
3	Parameter 2	Writing No. (0 to 19)	BYTE	1
4	Parameter 3	Reserved	char	3
5	Parameter 4	User data	char	32
Total number of transferred bytes				40

- Response data: Standard type (1 byte)

♦♦♦Whenr eading♦♦♦

- The number of transferred bytes: 4 bytes
- Parameter: See the table below.

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Command Name	URW	char	3
2	Parameter 1	Parameter mode (0x00: Read, 0x01: Set) Set 0x00.	BYTE	1
3	Parameter 2	Reading No. (0 to 19)	BYTE	1
Total number of transferred bytes				5

- Response data: 32 byte

No.	Name	Contents	Types of Variables	The Number of Bytes
1	Response data 1	User data	char	32
Total number of response data bytes				32

MEMO

- No.0 writing is used in the EDX of the device name.
- After the initialization by using the INI command, the writing No. 0 will be the default character string ("100A-" + "serial No."). The character strings, saved in the writing No. 1 to writing No. 19, will be cleared by zero.

[Example]

Suppose the serial No. is EDX100001.

The default character string, saved in the writing No. 0, is 100A-EDX100001.

7-4 EXAMPLE OF DATA DUMP OF COMMUNICATION PACKET

Example of data dump of Command packet (PC → EDX) when conducting SYS command (Read mode = 0) is described in the following.
The first 128 bytes is a header section, the next 3 bytes, command identifier, and the remaining 1 byte, parameter.

```
        +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000000  45 44 58 2D 31 30 30 41-00 00 00 00 00 00 00 00  EDX-100A........
000010  00 00 00 00 04 00 00 00-00 00 00 00 00 00 00 00  ................
000020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000050  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000070  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000080  53 59 53 00                                      SYS.
```

The following is an example of data damp of Response packet (EDX → PC) to the SYS command.
Te first 128 bytes is a header section and the following 56 bytes, response data to the SYS command.
Details of the response data is described in the following.

Model (20 bytes):	EDX-100A
Software version:	01. 06
Card type (Slot 1):	02 (CVD-40A)
Card type (Slot 2):	06 (CTA-40A)
Card type (Slot 3):	00 (Not installed)
Card type (Slot 4):	0F (DPM-42A-F)
Chassis size:	32
Device ID No.:	-1 (‘F’)
Parameter file version:	1

```
        +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000000  45 44 58 2D 31 30 30 41-00 00 00 00 00 00 00 00  EDX-100A........
000010  00 00 00 00 38 00 00 00-00 00 00 00 00 00 00 04  ....8...........
000020  00 00 00 00 00 FF 00 00-00 00 00 00 00 00 00 00  ................
000030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000050  00 00 01 FF 00 00 18 04-FF 00 00 00 00 00 00 00  ................
000060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000070  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 53  ...............S
000080  45 44 58 2D 31 30 30 41-00 00 00 00 00 00 00 00  EDX-100A........
000090  00 00 00 00 30 31 2E 30-36 00 00 00 00 00 00 00  ....01.06.......
0000A0  00 00 00 00 00 00 00 00-02 06 00 0F 00 00 00 00  ................
0000B0  20 FF 01 00 00 00 00 00-                         ........
```

MEMO

- For SYS command, see “7-3-18 Reading System Information (SYS).”
- For details of the header section, see “5-1 COMMAND PACKET (PC → EDX) and “5-2 RESPONSE PACKET (EDX → PC).”

8. MEASURING CONDITION FILE

Measuring condition file (File name: EDX100A.SET) is a binary file with measuring conditions preset in the EDX gathered into 1 file. By saving the created measuring condition in the CF card, irrespective of online/offline status, the measuring condition can be set in the EDX.
In addition, with control command “Setting/Reading Meas Conditions (MES),” measuring condition sent and received between the PC and EDX are set in same format as this measuring condition file.
Format of the measuring condition file is described in the next page.

8-1 MEASURING CONDITION FILE FORMAT

The whole size: 19700 bytes

No.	Classification	Contents and Range	Types of Variables	The Number of Bytes
1	Overall information 112 bytes	Device ID (“EDX-100A” fixed, quotations “ ” is not included.)	char	20
		Parameter format version (1 fixed)	WORD	2
		KS2 based language (0: Japanese, 1: English)	BYTE	1
		Chassis size (8, 16, and 32)	BYTE	1
		Slot 1 card type No. (*1)	BYTE	1
		Slot 2 card type No. (*1)	BYTE	1
		Slot 3 card type No. (*1)	BYTE	1
		Slot 4 card type No. (*1)	BYTE	1
		Beep sound when excessive input is applied (0: OFF, 1: When exceeded, 2: Until STOP/PAUSE key is pressed)	BYTE	1
		The total number of connected units during the synchronous operation (0 or 1: 8 units 2 to 8: The total number of connected units)	BYTE	1
		Switching oscillator (0: Internal 12 kHz, 1: External 12 kHz, 2 to 3: Reserved)	BYTE	1
		Beep sound 0: OFF 1: High pitch sound 2: Low pitch sound	BYTE	1
		Arbitrary unit 1 (Max 7 characters) (*2)	char	8
		Arbitrary unit 2 (Max 7 characters) (*2)	char	8
		Arbitrary unit 3 (Max 7 characters) (*2)	char	8
		File overwrite check (0: Yes, 1: No)	BYTE	1
		After recording is finished, restart the A/D conversion (0: Yes, 1: No)	BYTE	1
		Reserved	char	2
		Slot 1, custom-made cable correction value (*12)	float	4
		Slot 2, custom-made cable correction value (*12)	float	4
		Slot 3, custom-made cable correction value (*12)	float	4
		Slot 4, custom-made cable correction value (*12)	float	4
		Slot 1, input cable No. (*12)	BYTE	1
		Slot 2, input cable No. (*12)	BYTE	1
		Slot 3, input cable No. (*12)	BYTE	1
		Slot 4, input cable No. (*12)	BYTE	1
		Reserved	char	28
2	Recorded file information 80 bytes	Recorded file name (Max. 20 characters) (*3)	char	22
		File No. (0 to 9999) (*3)	WORD	2
		File title (Max. 40 characters) (*3)	char	44
		Reserved	char	12

(From the previous page)

No.	Classification	Contents and Range		Types of Variables	The Number of Bytes
3	Measurement condition (Common condition) 60 bytes	Sampling frequency (1 to 100000) (*3) (*11)		DWORD	4
		Sampling frequency type (0: Internal, 1: External) (*3)		BYTE	1
		Measuring mode (*3) 0 Manual 1: Interval : 2 Analog trigger 4: External trigger : 6 Complex trigger 10: PC recording (*4)		BYTE	1
		The number of recorded analog CHs (The umber of CHs set to Meas ON in analog CH condition)		WORD	2
		The number of recorded data in manual measurement (0 or 2 to the number of recording available data) (*3) 0: Recorded to the higher limit of the CF card capacity (However, file size should be within 2 G bytes) 2 to: Recording ends with the number of specified recording times.		INT64	8
		System flag 0x00000020: Use the CAN_DOUBLE function. **(*10)** 0x00000040: Invalid the PAUSE function		DWORD	4
		Reserved		char	44
4	Measuring condition (*3) (Interval condition) 32 bytes	The number of interval recorded data (2 to the number of recording available data) (However, file size should be within 2 G bytes)		INT64	8
		Interval start time (*5)	Year (2000 to 2099)	WORD	2
			Month (1 to 12)	BYTE	1
			Day (1 to 31)	BYTE	1
			Hour (0 to 23)	BYTE	1
			Minute (0 to 59)	BYTE	1
			Second (0 to 59)	BYTE	1
			Reserved	char	1
		Interval distance (10 to) (*6)		DWORD	4
		Interval times (0 to 9999, 0: Infinite)		WORD	2
		Reserved		char	10

(From the previous page)

No.	Classification	Contents & Range	Types of Variables	The Number of Bytes
5	Measuring condition (*3) (Trigger common condition) 24 bytes	The number of trigger recoded data With end trigger: 0 Without end trigger: 1 to the number of recording available data	INT64	8
		Pre-trigger delay (0 to 262144) (*7)	DWORD	4
		Post-trigger delay (0 to 262144) (*7)	DWORD	4
		Trigger repeat times (0 to 9999, 0, 0: Infinite)	WORD	2
		End trigger (0: None, 1: Yes)	BYTE	1
		Reserved	char	5
6	Measuring condition (*3) (Analog trigger condition) 8 bytes	Start trigger CH (1 to 32, Analog CH with Meas ON)	BYTE	1
		Start trigger slope (0: UP, 1: DOWN)	BYTE	1
		Start trigger level (-32768 to 32767) (*8)	short	2
		End trigger CH (1 to 32, analog CH with Meas ON)	BYTE	1
		End trigger slope (0: UP, 1: DOWN)	BYTE	1
		End trigger level (-32768 to 32767) (*8)	short	2
7	Measuring condition (*3) (External trigger condition) 4 bytes	Start trigger slope (0: UP, 1: DOWN)	BYTE	1
		End trigger slope (0: UP, 1: DOWN)	BYTE	1
		Reserved	char	2

(From the previous page)

No.	Classification	Contents & Range	Types of Variables	The Number of Bytes
8	Measuring condition (*3) (Complex trigger condition) 32 bytes	Start trigger CH 1(1 to 32, Analog CH with Meas ON)	BYTE	1
		Start trigger CH 2 (1 to 32, Analog CH with Meas ON)	BYTE	1
		Start external trigger (0: Not use, 1: Use)	BYTE	1
		Start analog trigger slope 1 (0: UP, 1: DOWN)	BYTE	1
		Start analog trigger slope 2 (0: UP, 1: DOWN)	BYTE	1
		Start external trigger slope (0: UP, 1: DOWN)	BYTE	1
		Start AND/OR setting 1 (0: OR, 1: AND) (Set AND/OR of start analog trigger CHs 1 and 2.)	BYTE	1
		Start AND/OR setting 2 (0: OR, 1: AND) (Set AND/OR of the output of start AND/OR setting 1 and the external trigger.)	BYTE	1
		Start trigger level 1 (-32768 to 32767) (*8)	short	2
		Start trigger level 2 (-32768 to 32767) (*8)	short	2
		Reserved	char	4
		End trigger CH 1(1 to 32, analog CH of Meas ON)	BYTE	1
		End trigger CH2 (1 to 32, analog CH of Meas ON)	BYTE	1
		End external trigger (0: Not use, 1: Use)	BYTE	1
		End analog trigger slope 1 (0: UP, 1: DOWN)	BYTE	1
		End analog trigger slope 2 (0: UP, 1: DOWN)	BYTE	1
		End external trigger slope (0: UP< 1: DOWN)	BYTE	1
		End AND/OR setting 1 (0: OR, 1: AND) (Set AND/OR of end analog trigger CHs 1 and 2.)	BYTE	1
		End AND/OR setting 2 (0: OR, 1: AND) (Set AND/OR of the output of end trigger AND/OR setting 1 and the external trigger.)	BYTE	1
		End trigger level 1 (-32768 to 32767) (*8)	short	2
		End trigger level 2 (-32768 to 32767) (*8)	short	2
		Reserved	char	4

(From the previous page)

No.	Classification	Contents and Range	Types of Variables	The Number of Bytes
9	Analog CH condition (CH-1 condition) (*9) 64 bytes *2048 bytes with 32 CHs	Meas ON/OFF -1: No card or no CH 0: Not measure 1: Measure	BYTE	1
		Mode No. (0 to)	BYTE	1
		Range No. (0 to)	BYTE	1
		High pass filter No. (0 to)	BYTE	1
		Low pass filter No. (0 to)	BYTE	1
		BAL ON/OFF (0: OFF, 1: ON, 2: NONE (only CVM-40A and CVM-41A))	BYTE	1
		CAL ON/OFF (0: OFF, 1: ON)	BYTE	1
		CAL range No. (0 to)	BYTE	1
		CAL coefficient value	float	4
		Offset value	float	4
		Unit No. (0 to 62)	BYTE	1
		Internal sensitivity compensation ON/OFF (0: OFF, 1: ON)	BYTE	1
		Card type No.	BYTE	1
		Reserved	char	1
		CH name (Max. 40 characters)	char	44
	Analog CH condition (CH-2 condition)	Ditto	---	64
	Analog CH condition (CH-3 condition)	Ditto	---	64
	• • •		---	
	Analog CH condition (CH-32 condition)	Ditto	---	64
10	CAN information (General Information) 4 bytes	The number of CAN-IDs (0 to 32)	BYTE	1
		How to extract CAN-CH conditions (0: Start bit + bit length 1: start position + end position)	BYTE	1
		Reserved	char	2

(From the previous page)

No.	Classification	Contents and Range	Types of Variables	The Number of Bytes
11	CAN information (Communication condition 2) 8 bytes	Communication standard (0: High-speed, 1: Low-speed)	BYTE	1
		Communication speed (0 to 12) For details, see “8-4-2 CAN information (communication condition 1 and 2)”	BYTE	1
		Sample point (0 to 25) For details, see “8-4-2 CAN information (communication condition 1 and 2)”	BYTE	1
		The number of sampling times (0: 1 time, 1: 3 times)	BYTE	1
		Resynchronization jump width (0: 1 to 3: 4)	BYTE	1
		Termination resistor (0: OFF, 1: ON)	BYTE	1
		Reserved	char	2
12	CAN information (Communication condition 1) 8 bytes	Communication standard (0: High-speed, 1: Low-speed)	BYTE	1
		Communication speed (0 to 12) For details, see "8-4-2 CAN information (communication condition 1 and 2)."	BYTE	1
		Sample point (0 to 25) For details, see "8-4-2 CAN information (communication condition 1 and 2)."	BYTE	1
		The number of sampling times (0: 1 time, 1: 3 times)	BYTE	1
		Resynchronous jump width (0:1 to 3: 4)	BYTE	1
		Termination resistor (0: OFF, 1: ON)	BYTE	1
		Reserved	char	2

(From the previous page)

No.	Classification	Contents and Range	Types of Variables	The Number of Bytes
13	CAN information (ID1 conditions) 60 bytes *1920 bytes for 32 IDs	Measurement (0: Not to be measured, 1: To be measured)	BYTE	1
		Format (0: Standard format, 1: Extension format)	BYTE	1
		Data length (1 to 8)	BYTE	1
		Endian (0: Little, 1: Big)	BYTE	1
		LSB/MSB (0: LSB, 1: MSB)	BYTE	1
		Port No. (0: Port 1, 1: Port 2)	BYTE	1
		Reserved	char	2
		Frame ID No.	DWORD	4
		ID name (maximum 40 characters)	char	44
		Reserved	char	4
	CAN information (ID2 conditions)	Ditto	---	60
	CAN information (ID3 conditions)	Ditto	---	60
	.	.	.	.
	CAN information (ID32 conditions)	Ditto	---	60

(From the previous page)

No.	Classification	Contents	Types of Variables	The Number of Bytes
14	CAN information (CAN-CH1 conditions) 60 bytes *15,360 bytes for 32 IDs (8 channels/ID)	Measurement (0: OFF, 1: ON)	BYTE	1
		Start bit (0 to 63)	BYTE	1
		Bit length (1 to 64)	BYTE	1
		Data type 0: :Signed (signed integer) 1: Unsigned (unsigned integer) 2:Float(single precision floating decimal point) 3: Double (double precision floating decimal point)	BYTE	1
		Calibration coefficient When the system flag, in the measurement condition (common condition), is 0x00000020 (Use the CAN_DOUBLE function.), this item is not in use. **(*10)**	float	4
		Offset When the system flag, in the measurement condition (common condition), is 0x00000020 (Use the CAN_DOUBLE function.), this item is not in use. **(*10)**	float	4
		Channel name (maximum 40 characters) When the system flag, in the measurement condition (common condition), is 0x00000020 (Use the CAN_DOUBLE function.), this item varies as follows. **(*10)** Channel name : 20 bytes (20 characters) Reserved : 4 bytes Calibration coefficient : 8 bytes (double type) Offset :8 bytes (double type) Reserved : 4 bytes ---------- Total : 44 bytes	char	44
		Unit No. (0 to 62)	BYTE	1
		Reserved	char	3

(From the previous page)

No.	Classification	Contents	Types of Variables	The Number of Bytes
14	CAN information (CAN-CH2 conditions) 60 bytes	Ditto	---	60
	CAN information (CAN-CH3 conditions) 60 bytes	Ditto	---	60
	.	.	.	.
	CAN information (CAN-CH256 conditions) 60 bytes	Ditto	---	60

(*1) See “10. CARD TYPE NO. AND SET VALUE OF CONDITIONER CARD.”
To be error if it differs with the actual card structure.

(*2) The preset unit is assigned to unit Nos. 60 to 62. (See “9. UNIT NO. AND UNIT CHARACTER STRING.”)

(*3) Setting to synchronous slave units is ignored.

(*4) A/D conversion start available measuring mode with no CF card.
The EDX is in monitoring status and data recording, etc. is conducted by the PC.

(*5) If ‘0’ is set to all the interval start time, no interval start time is specified.
At this time, after the EDX receives the REC command from PC, the first data recording starts within 10 seconds.

(*6) Specify the 1st Recording time calculated from the number of interval recorded data + α (sec).
(For stand-alone EDX, α is more than 10, and for synchronous operation, α is more than 30.)

(*7) Setting available delay amount (The number of data) varies with the number of CHs set to Meas ON or remaining capacity of the CF card. Setting available delay amount is roughly calculated by the following expression.
Setting available delay amount = (512 × 1024)/(The number of CHs with Meas ON × 2)

(*8) Trigger level is a threshold value with analog CH set as a trigger source and set with A/D conversion value.
Full scale of the A/D conversion value of analog CH is 32000. For example, for strain range of 1000 με, when 500 με relevant strain is entered, A/D conversion value shall be 16000.

(*9) Setting available range of the analog CH condition varies with the installed conditioner card. For items other than Meas ON/OFF, if there is no setting item or if unknown or disable card is used, set analog CH condition to ‘0.’

MEMO

- Initialize the area indicated as ‘Reserved’ or unused area with ‘0.’
- For set value of the analog conditioner card, see “10. CARD TYPE NO. AND SET VALUE OF CONDITIONER CARD.”

(*10) The CAN_DOUBLE function is designed to be used for setting the calibration coefficient and offset, used in CAN measurements, in double type. For details, see “8-4-4 CAN information (CH1 to CH256)." When measuring data with using the CAN_DOUBLE function (0x00000020), the "CAN_DOUBLE" appears in General information of variable header section (Broad classification No.: 0x01) - Details of items No. 15 (Detailed classification No.: 0x2E) of the KS2 file. For details, see INSTRUCTION MANUAL for KYOWA STANDARD FORMAT KS2 FILE FORMAT.

(*11) For details of the inputting external clock signal, refer to “EDX-100A UNIVERSAL RECORDER INSTRUCTION MANUAL for Hardware.”

(*12) For details, see “8-5 CUSTOM-MADE CABLE CORRECTION VALUES AND INPUT CABLE”

8-2 GUIDE LINE FOR SETTING MEASURING CONDITION

When setting measuring conditions, since measuring conditions such as types of installed conditioner card, measuring mode, CH condition to be measured, the number of measuring CHs, the number of measured data, etc., are combined to form various combinations, it is not available to categorically describe the setting contents.
Especially, the number of recoded data or trigger delay amount may vary with the remaining capacity of the CF card. In addition, since the measuring condition may become error when it does not match with the EDX status, it is essential to match the measuring condition with the EDX status when measured.
When creating a new measuring condition, it is recommended to read the current measuring condition of the EDX to the PC by the MES command, edit the required items, and create the new measuring condition.
In this method, since the actual card structure is properly reflected on the PC, the measuring condition can be created by editing various setting contents such as conditioner condition, measuring mode, the number of recorded data, sampling frequency, etc.

For newly creating a measuring condition, see the following procedures.

1) Prepare a structure variable based on the measuring condition file format and 0 clear the entire structure variable.
2) Set the “Overall information” based on conditioner card installed on the actual EDX.
3) Set a file name, etc. of data recording.
4) Set “Analog CH condition” for 32 CHs.
   - Set Meas ON/OFF item as described in the following.
     Set a slot with installed card to ‘0’ (Not measure) or to ‘1’ (Measure).
     Set a slot with no card to ‘-1’ (No CH) for 8 CHs.
   - Set card type No. item to card No. of the installed card for 8 CHs.
     However, for conditioner cards in 1 card/4 CHs structure such as DPM-42A (-F) or CFV-40A card, set analog CH condition to only 4 CHs of the first half and set 4 CHs of the last half as not installed card.
5) Set “Measuring condition (Common condition).”
   - Set the total number of CHs that are set to ‘Meas ON’ in item 4) to the number of recorded analog CHs.
   - Set measuring mode, sampling frequency, etc.
6) For manual measurement, set the number of recorded data of “Measuring condition (Common condition).”
7) For trigger measurement, set “Measuring condition (Trigger common condition).”
   In addition to the above, set the following items.
   - For analog trigger measurement mode, set “Measuring condition (Analog trigger condition).”
   - For external trigger measurement mode, set “Measuring condition (External trigger condition).”
   - For complex trigger measurement mode, set “Measuring condition (Complex trigger condition).”
8) For interval measurement mode, set “Measuring condition (Interval condition).”
9) Sends the created structure variable to the EDX with the MES command if it is in online status.
   For creating the measuring condition file, create the file structure image with a file name “EDX100A.SET.”

MEMO

- When creating measuring condition, set all the unrelated items to ‘0.’
- When creating the original control software, the easiest way to understand the measuring condition file is to create a measuring condition file of the EDX with the DCS-100A and to dump the condition file.

8-3 EXAMPLE OF CREATING MEASURING CONDITION

Example of creating the actual measuring condition is described in binary dump format.

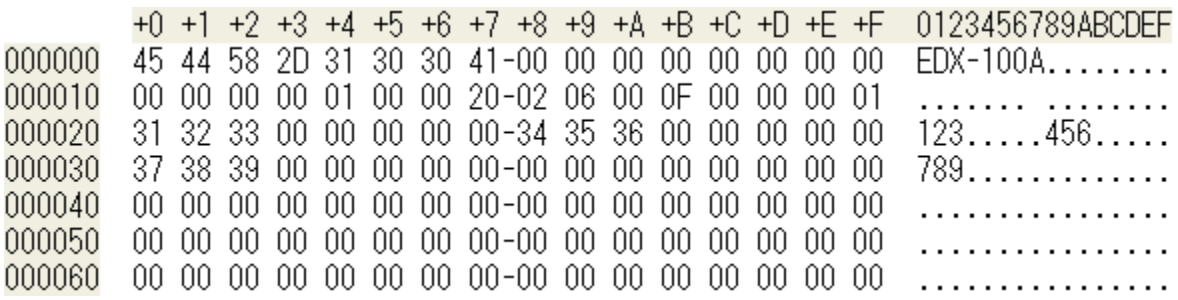
Assume that the EDX is in the following status.

- EDX-100A-4 (4-slot chasses), 1 EDX (Stand-alone)
  Slot 1 (CHs 1 to 8): CDV-40A
  Slot 2 (CHs 9 to 16): CTA-40A
  Slot 3 (CHs17 t0 24): Not installed
  Slot 4 (CHs 25 to 32): DPM-42A-F
- Oscillator status: 12 kHz (Internal)
- Beep sound: ON (Low pitch sound)
- Arbitrary units 1, 2, 3: “123,” “456,” and “789”
- Data file name: “TEST”
- File No.: 100
- File title: “Hello EDX-100A”
- Measuring mode: Manual measurement, the number of recorded data 1000 data
- Sampling frequency: 100 Hz (Internal lock)
- The number of measuring CHs: 20
- CH condition: Set the same condition for every card (See the following table.)
  (For the DPM-42A card, since it is in 4 CHs/card structure, 4 CHs of the last half is set as ‘No card.’)

CH Condition Setting Contents (Numeric values in parenthesis ( ) are preset Nos.)

	Slot 1 CDV-40A	Slot 2 CTA-40A	Slot 3 (Not installed)	Slot 4 DPM-42A-F
ON/OFF	ON (1)	ON (1)	None (-1)	ON (1)
Mode	Voltage (1)	T(ON) (2)	--- (0)	BV(2.0 V) (0)
Range	5.0 V (5)	400°C (1)	--- (0)	1 kμε (2)
HPF	0.2 Hz (1)	--- (0)	--- (0)	--- (0)
LPF	10 kHz (1)	--- (0)	--- (0)	300 Hz (2)
BAL ON/OFF	OFF (0)	OFF (0)	--- (0)	ON (1)
CAL ON/OFF	ON (1)	ON (1)	--- (0)	ON (1)
CAL range	100% (0)	100% (0)	--- (0)	50% (1)
CAL coefficient value	0.1 (0.1)	1.0 (1.0)	--- (0.0)	(1.0)
Offset value	0.0 (0.0)	-25.0 (-25.0)	--- (0.0)	(0.0)
Unit No.	V (3)	℃ (9)	--- (0)	με (0)
Internal sensitivity compensation ON/OFF	ON (1)	--- (0)	--- (0)	ON (1)
Card type No.	CDV-40A (2)	CTA-40A (6)	--- (0)	DPM-42A-F (15)
CH name	“V Sensor”	“TC Sensor”	“ ”	“St Sensor”

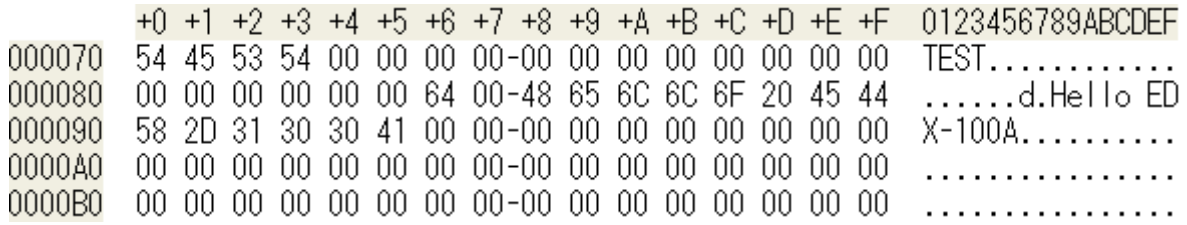
■ Condition Setting Dump Window (Overall Information)



```
        +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000000  45 44 58 2D 31 30 30 41-00 00 00 00 00 00 00 00  EDX-100A........
000010  00 00 00 00 01 00 00 20-02 06 00 0F 00 00 00 01  ....... ........
000020  31 32 33 00 00 00 00 00-34 35 36 00 00 00 00 00  123.....456.....
000030  37 38 39 00 00 00 00 00-00 00 00 00 00 00 00 00  789.............
000040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000050  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Address Range	Size	Setting Contents	Set Value
0x0000 to 0x0013	22	Device ID No.	“EDX-100A”
0x0014 to 0x0015	2	Parameter file version	1
0x0016 to 0x0016	1	KS2 created language	0
0x0017 to 0x0017	1	Chassis size	32
0x0018 to 0x0018	1	Slot 1 card type No.	2
0x0019 to 0x0019	1	Slot 2 card type No.	6
0x001A to 0x001A	1	Slot 3 card type No.	0
0x001B to 0x001B	1	Slot 4 card type No.	15
0x001C to 0x001C	1	Beep sound when excessive input is applied	0
0x001D to 0x001D	1	Reserved	0
0x001E to 0x001E	1	Switching oscillator	0
0x001F to 0x001F	1	Beep sound	1
0x0020 to 0x0027	8	Arbitrary unit 1	“123”
0x0028 to 0x002F	8	Arbitrary unit 2	“456”
0x0030 to 0x0037	8	Arbitrary unit character 3	“789”
0x0038 to 0x0038	1	File overwrite check	0
0x0039 to 0x0039	1	After recording is finished, restart A/D conversion	0
0x003A to 0x006F	54	Reserved	0

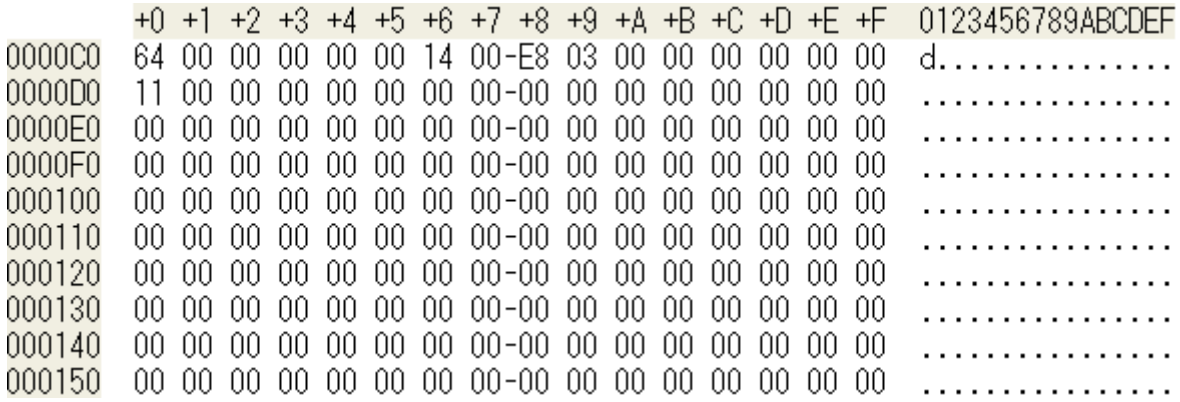
■ Condition Setting Dump Window (Recorded File Information)



```
        +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000070  54 45 53 54 00 00 00 00-00 00 00 00 00 00 00 00  TEST............
000080  00 00 00 00 00 00 64 00-48 65 6C 6C 6F 20 45 44  ......d.Hello ED
000090  58 2D 31 30 30 41 00 00-00 00 00 00 00 00 00 00  X-100A..........
0000A0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0000B0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Address Range	Size	Setting Contents	Set Value
0x0070 to 0x0085	22	Recorded file name	“TEST”
0x0080 to 0x0087	2	File No.	100
0x0088 to 0x00B3	44	File title	“Hello EDX-100A”
0x00B4 to 0x00BF	12	Reserved	0

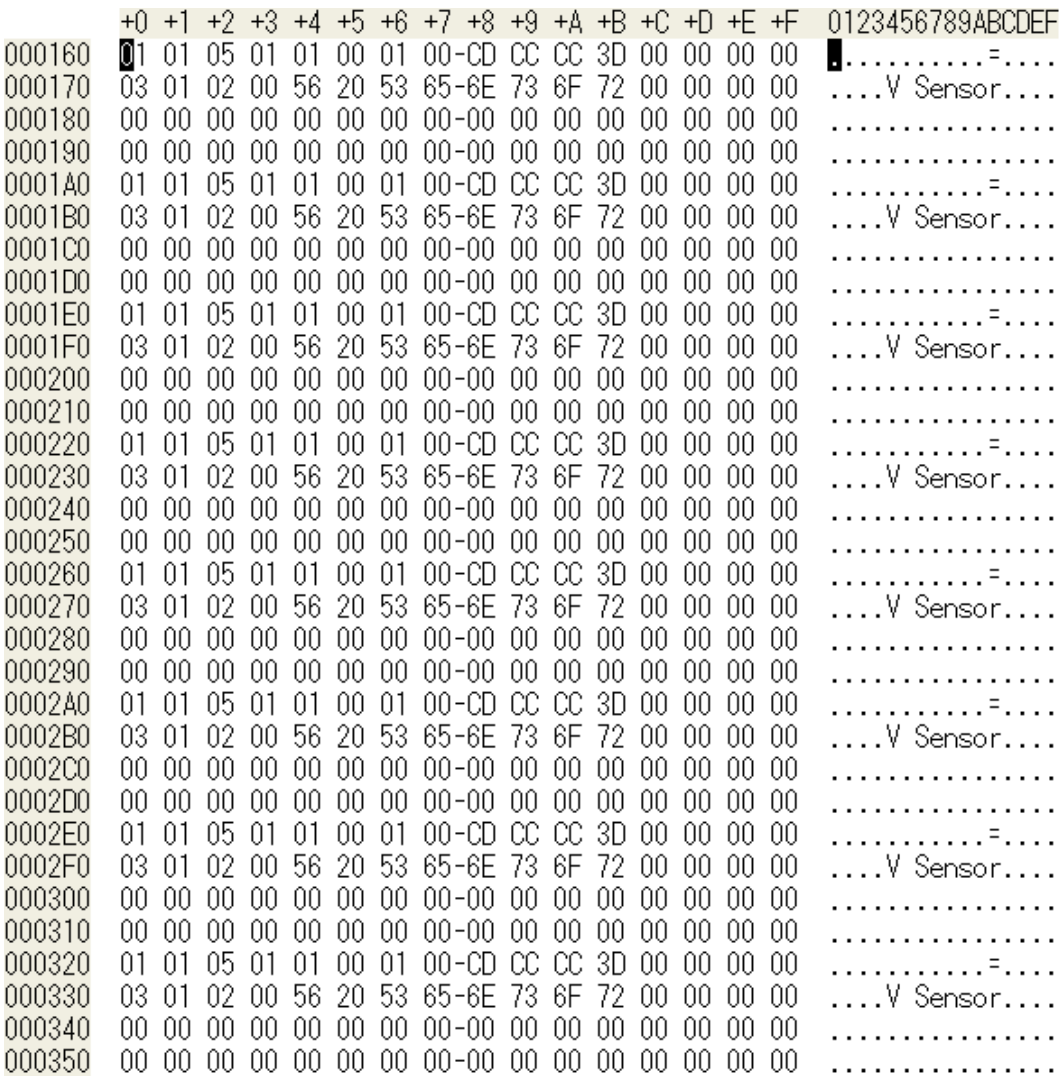
■ Condition Setting Dump Window (Measuring Condition)



```
          +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
0000C0    64 00 00 00 00 00 14 00-E8 03 00 00 00 00 00 00  d...............
0000D0    11 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0000E0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0000F0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000100    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000110    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000120    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000130    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000140    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000150    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Address Range	Size	Setting Contents	Set Value
0x00C0 to 0x00C3	4	Sampling frequency	100 [Hz]
0x00C4 to 0x00C4	1	Sampling frequency type	0 (Internal)
0x00C5 to 0x00C5	1	Measuring mode	0 (Manual)
0x00C6 to 0x00C7	2	The number of recorded analog CHs	20
0x00C8 to 0x00CF	8	The number of recorded data in manual measurement	1000
0x00D0 to 0x00FB	44	Reserved	0
0x00FC to 0x011B	32	Measuring condition (Interval condition)	0
0x011C to 0x0133	24	Measuring condition (Trigger common condition)	0
0x0134 to 0x013B	8	Measuring condition (Analog trigger condition)	0
0x013C to 0x013F	4	Measuring condition (External trigger condition)	0
0x0140 to 0x015F	32	Measuring condition (Complex trigger condition)	0

■ Condition Setting Dump Window (Analog CH Condition CHs 1 to 8)



```
        +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000160  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
000170  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
000180  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000190  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0001A0  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
0001B0  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
0001C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0001D0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0001E0  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
0001F0  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
000200  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000210  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000220  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
000230  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
000240  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000250  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000260  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
000270  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
000280  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000290  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0002A0  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
0002B0  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
0002C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0002D0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0002E0  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
0002F0  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
000300  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000310  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000320  01 01 05 01 01 00 01 00-CD CC CC 3D 00 00 00 00  ..........=....
000330  03 01 02 00 56 20 53 65-6E 73 6F 72 00 00 00 00  ....V Sensor....
000340  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000350  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Setting Contents of CH 1 (The same contents shall be applied for CHs 2 to 8)

Address Range	Size	Setting Contents	Set Value
0x0160 to 0x0160	1	Meas ON/OFF	1 (Measure)
0x0161 to 0x0161	1	Mode No.	1 (Voltage mode)
0x0162 to 0x0162	1	Range No.	5 (5.0 V)
0x0163 to 0x0163	1	High pass filter No.	1 (0.2 Hz)
0x0164 to 0x0164	1	Low pass filter No.	1 (10 kHz)
0x0165 to 0x0165	1	BAL ON/OFF	0 (OFF)
0x0166 to 0x0166	1	CAL ON/OFF	1 (ON)
0x0167 to 0x0167	1	CAL range No.	0 (100%)
0x0168 to 0x016B	4	CAL coefficient value	0.1
0x016C to 0x016F	4	Offset value	0.0
0x0170 to 0x0170	1	Unit No.	3 (V)
0x0171 to 0x0171	1	Internal sensitivity compensation ON/OFF	1 (ON)
0x0172 to 0x0172	1	Card type No.	2 (CDV-40A)
0x0173 to 0x0173	1	Reserved	0
0x0174 to 0x017F	44	CH Name	“V Sensor”

■ Condition Setting Dump Window (Analog CH Condition CHs 9 to 16)

```
        +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000360  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
000370  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
000380  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000390  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0003A0  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
0003B0  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
0003C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0003D0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0003E0  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
0003F0  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
000400  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000410  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000420  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
000430  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
000440  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000450  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000460  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
000470  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
000480  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000490  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0004A0  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
0004B0  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
0004C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0004D0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0004E0  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
0004F0  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
000500  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000510  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000520  01 02 01 00 00 00 01 00-00 00 80 3F 00 00 C8 C1  .........?....
000530  09 00 06 00 54 43 20 53-65 6E 73 6F 72 00 00 00  ....TC Sensor...
000540  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000550  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Setting Contents of CH 9 (The same contents is applied for CHs 10 to 16)

Address Range	Size	Setting Contents	Set value
0x0360 to 0x0360	1	Meas ON/OFF	1 (Measure)
0x0361 to 0x0361	1	Mode No.	2 (TC: ON))
0x0362 to 0x0362	1	Range No.	1 (400°C)
0x0363 to 0x0363	1	High pass filter No.	0 (OFF: None)
0x0364 to 0x0364	1	Low pass filter No.	0 (OFF: None)
0x0365 to 0x0365	1	BAL ON/OFF	0 (OFF: None)
0x0366 to 0x0366	1	CAL ON/OFF	1 (ON)
0x0367 to 0x0367	1	CAL range No.	0 (100%)
0x0368 to 0x036B	4	CAL coefficient value	1.0
0x036C to 0x036F	4	Offset value	-25.0
0x0370 to 0x0370	1	Unit No.	9 (°C)
0x0371 to 0x0371	1	Internal sensitivity compensation ON/OFF	0 (OFF: None)
0x0372 to 0x0372	1	Card type No.	6 (CTA-40A)
0x0373 to 0x0373	1	Reserved	0
0x0374 to 0x039F	44	CH name	“TC Sensor”

■ Condition Setting Dump Window (Analog CH Condition CHs 17 to 24)

```
          +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000560    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000570    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000580    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000590    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0005A0    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0005B0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0005C0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0005D0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0005E0    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0005F0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000600    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000610    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000620    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000630    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000640    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000650    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000660    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000670    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000680    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000690    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0006A0    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0006B0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0006C0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0006D0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0006E0    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0006F0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000700    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000710    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000720    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000730    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000740    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000750    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Setting Contents of CH 17 (The same contents are also provided for CHs 18 to 24)

Address Range	Size	Setting Contents	Set Value
0x0560 to 0x0560	1	Meas ON/OFF	-1 (No CH)
0x0561 to 0x0561	1	Mode No.	0
0x0562 to 0x0562	1	Range No.	0
0x0563 to 0x0563	1	High pass filter No.	0
0x0564 to 0x0564	1	Low pass filter No.	0
0x0565 to 0x0565	1	BAL ON/OFF	0
0x0566 to 0x0566	1	CAL ON/OFF	0
0x0567 to 0x0567	1	CAL range No.	0
0x0568 to 0x056B	4	CAL coefficient value	0
0x056C to 0x056F	4	Offset value	0
0x0570 to 0x0570	1	Unit No.	0
0x0571 to 0x0571	1	Internal sensitivity compensation ON/OFF	0
0x0572 to 0x0572	1	Card type No.	0
0x0573 to 0x0573	1	Reserved	0
0x0574 to 0x059F	44	CH name	0

■ Condition Setting Dump Window (Analog CH Condition CHs 25 to 32)

```
          +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F  0123456789ABCDEF
000760    01 00 02 00 02 01 01 01-00 00 80 3F 00 00 00 00  ...........?....
000770    00 01 0F 00 53 74 20 53-65 6E 73 6F 72 00 00 00  ....St Sensor...
000780    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000790    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0007A0    01 00 02 00 02 01 01 01-00 00 80 3F 00 00 00 00  ...........?....
0007B0    00 01 0F 00 53 74 20 53-65 6E 73 6F 72 00 00 00  ....St Sensor...
0007C0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0007D0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0007E0    01 00 02 00 02 01 01 01-00 00 80 3F 00 00 00 00  ...........?....
0007F0    00 01 0F 00 53 74 20 53-65 6E 73 6F 72 00 00 00  ....St Sensor...
000800    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000810    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000820    01 00 02 00 02 01 01 01-00 00 80 3F 00 00 00 00  ...........?....
000830    00 01 0F 00 53 74 20 53-65 6E 73 6F 72 00 00 00  ....St Sensor...
000840    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000850    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000860    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000870    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000880    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000890    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0008A0    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0008B0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0008C0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0008D0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0008E0    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
0008F0    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000900    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000910    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000920    FF 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000930    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000940    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
000950    00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  ................
```

Setting Contents of CH 25 (The same contents are also provided for CHs 26 to 28)

Address Range	Size	Setting Contents	Set Value
0x0760 to 0x0760	1	Meas ON/OFF	1 (Measure)
0x0761 to 0x0761	1	Mode No.	0 (BV(2.0 V))
0x0762 to 0x0762	1	Range No.	2 (1 kμε)
0x0763 to 0x0763	1	High pass filter No.	0 (Off: None)
0x0764 to 0x0764	1	Low pass filter No.	2 (300 Hz)
0x0765 to 0x0765	1	BAL ON/OFF	1 (ON)
0x0766 to 0x0766	1	CAL ON/OFF	1 (ON)
0x0767 to 0x0767	1	CAL range No.	1 (50%)
0x0768 to 0x076B	4	CAL coefficient value	1.0
0x076C to 0x076F	4	Offset value	0.0
0x0770 to 0x0770	1	Unit No.	0 (με)
0x0771 to 0x0771	1	Internal sensitivity compensation ON/OFF	1 (ON)
0x0772 to 0x0772	1	Card type No.	15 (DPM-42A-F)
0x0773 to 0x0773	1	Reserved	0
0x0774 to 0x079F	44	CH name	“St Sensor”

Setting Contents of CH 29 (The same contents are also provided for CHs 30 to 31)

Address Range	Size	Setting Contents	
0x0860 to 0x0860	1	Meas ON/OFF	-1 (No CH)
0x0861 to 0x0861	1	Mode No.	0
0x0862 to 0x0862	1	Range No.	0
0x0863 to 0x0863	1	High pass filter No.	0
0x0864 to 0x0864	1	Low pass filter No.	0
0x0865 to 0x0865	1	BAL ON/OFF	0
0x0866 to 0x0866	1	CAL ON/OFF	0
0x0867 to 0x0867	1	CAL range No.	0
0x0868 to 0x086B	4	CAL coefficient value	0
0x086C to 0x086F	4	Offset value	0
0x0870 to 0x0870	1	Unit No.	0
0x0871 to 0x0871	1	Internal sensitivity compensation ON/OFF	0
0x0872 to 0x0872	1	Card type No.	0
0x0873 to 0x0873	1	Reserved	0
0x0874 to 0x089F	44	CH name	0

8-4 SUPPLEMENT OF SETTING CAN INFORMATION (CAN-40A/41A)

This section describes how to set the conditions by using the CAN-40A/41A.

8-4-1 CAN information (general information)

(1) The number of CAN-IDs
Sets the total number of IDs of the target CAN-ID. The total number range is 0 to 32. Set “0” for not using a CAN-40A/41A.
The number of CAN-IDs should be the total number of measurement ON (Measurement: 1 = Measure) IDs.

(2) How to extract CAN-CH conditions
Sets the cutout method of the CAN-CH conditions.
To decide how to cutout CH conditions of the CAN-40A/41A when reproducing the data file recorded with data reproduction and analyzing software such as the DAS-200A.
Ranges are 0: Start bit + bit length or 1: start position + end position.
The cutout method has no influence on data recording. For not using, set “0.”

8-4-2 CAN information (communication condition 1 and 2)

Sets communication conditions of CAN-40A/41A. The communication condition 1 is for port 1 and communication condition 2 is for port 2.
CAN-40A: Port 1 only (Set “0” to every condition in the communication condition 2.)
CAN-41A: Port 1 and port 2 for not using either one port, set "0" to every condition in the remaining port.

(1) Communication standard

Sets the communication standard of the target CAN bus.

0: High-speed or 1: Low-speed

(2) Communication speed

Sets the communication speed of the CAN bus.

Setting values are described as follows.

Value	Communication speed (kbps)	Available or not available	
		High-speed	Low-speed
0	1000	✓	
1	800	✓	
2	500	✓	
3	250	✓	
4	125	✓	✓
5	100	✓	✓
6	83.3	✓	✓
7	62.5	✓	✓
8	50	✓	✓
9	33.3	✓	✓
10	25	✓	✓
11	20	✓	✓
12	10	✓	✓

✓: Available

(3) Sample point

It is as follows by whether transmission speed is 800 [kbps].

Communication speed: Not 800 [kbps]

Value	Sample point
0	85% (TSEG1 = 16, TSEG2 = 3), 40M Hz
1	80% (TSEG1 = 15, TSEG2 = 4), 40M Hz
2	75% (TSEG1 = 14, TSEG2 = 5), 40M Hz
3	70% (TSEG1 = 13, TSEG2 = 6), 40M Hz
4	65% (TSEG1 = 12, TSEG2 = 7), 40M Hz
5	60% (TSEG1 = 11, TSEG2 = 8), 40M Hz
6	80% (TSEG1 = 7, TSEG2 = 2), 40M Hz
7	70% (TSEG1 = 6, TSEG2 = 3), 40M Hz
8	60% (TSEG1 = 5, TSEG2 = 4), 40M Hz
9	87.5% (TSEG1 = 13, TSEG2 = 2), 32M Hz
10	81.3% (TSEG1 = 12, TSEG2 = 3), 32M Hz
11	75.0% (TSEG1 = 11, TSEG2 = 4), 32M Hz
12	68.8% (TSEG1 = 10, TSEG2 = 5), 32M Hz
13	62.5% (TSEG1 = 9, TSEG2 = 6), 32M Hz
14	56.3% (TSEG1 = 8, TSEG2 = 7), 32M Hz
15	75.0% (TSEG1 = 5, TSEG2 = 2), 32M Hz
16	62.5% (TSEG1 = 4, TSEG2 = 3), 32M Hz

Communication speed: 800 [kbps]

Value	Sample point
17	85% (TSEG1 = 16, TSEG2 = 3), 32M Hz
18	80% (TSEG1 = 15, TSEG2 = 4), 32M Hz
19	75% (TSEG1 = 14, TSEG2 = 5), 32M Hz
20	70% (TSEG1 = 13, TSEG2 = 6), 32M Hz
21	65% (TSEG1 = 12, TSEG2 = 7), 32M Hz
22	60% (TSEG1 = 11, TSEG2 = 8), 32M Hz
23	80% (TSEG1 = 7, TSEG2 = 2), 32M Hz
24	70% (TSEG1 = 6, TSEG2 = 3), 32M Hz
25	60% (TSEG1 = 5, TSEG2 = 4), 32M Hz

(4) The number of sampling times

Sets the number of sampling times.

0: 1 time or 1: 3 times

The number of sampling times: 1 (3 times) is available when the communication standard is 0: High-speed only. Note that the communication speed will be limited.

NOTE

When the communication standard is 0: High-speed + the number of sampling times is 1: 3 times, available communication speeds are 4 types; 1000, 800, 500, and 250 [kbps].

(5) Resynchronization jump width

Sets the resynchronization jump width. The values are as follows.

Value	Resynchronization jump width [TQ]
0	1
1	2
2	3
3	4

NOTE

The TSEG2 value of the sample point and Resynchronization jump width should satisfy the following.

(Resynchronization jump width) <= (TSEG2 value of the sample point)

(6) Termination resistor

Sets whether the terminating resistor on a CAN card is valid.

0 (OFF: Invalid) or 1 (ON: Valid)

8-4-3 CAN information (ID1 to ID32)

Sets ID conditions of CAN-40A/41A. The CAN-40A/41A records data in fixed-length packets (known as “data frame”). The term “ID” is a storing box of data frames. The CAN-40A has 16 boxes and CAN-41A has 32 boxes. The ID conditions of CAN cards are conditions for storing data frames to the “box.”
The data frame is 8-byte fixed length. If you select ON in the following item (1), 8-bytes data/ID is recorded. If you try to measure all IDs , the data volume/sampling is as follows.
CAN-40A: 8 × 16 = 128 bytes
CAN-41A: 8 × 32 = 256 bytes
CAN-40A: ID1 to ID16 are available. Set “0” to ID17 to ID32.
CAN-41A: ID1 to ID32 are available.

(1) Measurement
Sets whether the ID is to be measured or not to be measured.
0 (OFF: Not to be measured) or 1 (ON: To be measured)

(2) Format
Sets the format of the frame ID No. (see "(7) Frame ID No. in the 8-4-3 CAN information (ID1 to ID32).").
0: Standard format or 1: Extension format
For the standard format: The frame ID No. is 0 to 7FFh (11 bits)
For the extension format: The frame ID No. is 0 to 1FFFFFFFh (29 bits)
Make sure the item matches the settings of the CAN-data-output equipment.

(3) Data length
Sets the valid data length of the data frame. The data frames covered by the EDX are 8-byte fixed length. If data less than 8 bytes is output from the CAN-data-output-equipment, 0 is added to satisfy the 8-byte fixed length.
0 (1-byte fixed) to 7 (8-byte fixed)
Make sure the item matches the settings of the CAN-data-output equipment.

(4) Endian
Sets the data frame assignment.
0 (Little) or 1 (Big)
Make sure the item matches the settings of the CAN-data-output equipment.

(5) LSB/MSB (0: LSB, 1: MSB)
Sets the LSB side or MSB side when cutout the CAN-CH data.
When the (4) Endian is 1: Big, 0: LSB or 1: MSB can be selected.
When the (4) Endian is 0: Little, set 0: LSB.

(6) Port No.
Sets the port No.

(7) Frame ID No.

Sets the data frame ID No.

The range of the data frame ID No. depends on the format. (See the item (2) Format in the "8-4-3 CAN information (ID1 to ID32).")

NOTE

Make sure the frame ID numbers will not overlap.

However, overlapping frame ID numbers are available under the following conditions.

- Having different port No. (CAN-41A)
- Having different format.

(8) ID name

Sets the ID name within 40 characters (optional).

For not using, set “0.”

8-4-4 CAN information (CH1 to CH256)

With the CAN-40A/41A, one data frame is divided (cutout) into maximum 8 data items. CH numbers are allocated to the divided data for management. The CAN-CH conditions are for setting the cutout conditions of a data frame. With the EDX, you can display the cutout data in physical quantity by multiplying coefficients. You can also treat the divided data as well as analog CH data.
Since every CAN-CH condition has setting conditions of 8 channels/ID, the EDX has 8 CHs × 32 IDs = 256 CHs.
The CAN-ID No. and CAN-CH No. are as follows.

CAN-ID No.	CAN-CH No.	Remarks
1	1 to 8	For CAN-40A and CAN-41A
2	9 to 16	
3	17 to 24	
・ ・ ・		
16	121 to 128	
17	129 to 136	CAN-41A only
18	137 to 144	
・ ・ ・		
32	249 to 256	

*Since the number of CAN-IDs of the CAN-40A is 16, the first 128 channels are valid.

(1) Measurement
Sets whether CAN-CH conditions are valid or invalid.
0 (OFF: Not to be measured) or 1 (ON: To be measured)
Note that 1 (ON: To be measured) indicates valid conditions and 0 (No: Not to be measured): invalid conditions.
When the CAN-ID is 1 (ON: To be measured), make sure the least one of the applicable CAN-CH conditions is 1 (ON: To be measured).

(2) Start bit
Sets the cutout-start position in bits.
0 to 63

(3) Bit length
Sets the cutout-data size in bits.
1 to 64

(4) Data type
Sets the cutout-data type.
0 to 3

No.	Notation	Details
0	Signed	Signed integer
1	Unsigned	Unsigned integer
2	Float	Single precision floating decimal point variable (bit length: 32 bits)
3	Double	Double precision floating decimal point variable (bit length: 64 bits)

(5) Calibration coefficient/offset

- When not using the CAN_DOUBLE function.
  Sets multiplier (Calibration coefficient: A) and additional value (Offset: B) for converting the cutout data into physical quantity. Sets A and B in the floating decimal point variable (Float). Suppose the cutout data is X. The physical quantity to be converted (Y) is Y = AX + B.

- When using the CAN_DOUBLE function.
  When the System flag, in the measurement condition (No.3:common condition), is 0x00000020 (Use the CAN_DOUBLE function.), this calibration coefficient and offset are not in use.

(6) Channel name

- When not using the CAN_DOUBLE function.
  Sets the channel name within 40 characters (optional).
  For not using, set “0.”

- When using the CAN_DOUBLE function.
  When the System flag, in the measurement condition (No.3:common condition), is 0x00000020 (Use the CAN_DOUBLE function.), this item varies as follows.

Channel name (20 characters)	20 bytes
Reserved	4 bytes
Calibration coefficient	8 bytes (double type)
Offset	8 bytes (double type)
Reserved	4 bytes
Total	44 bytes

  To convert data into physical quantity, instead of using the (5) Calibration coefficient/offset in “8-4-4 CAN information (CH1 to CH256)”, be sure to use the calibration coefficient and offset in this item.

- Supplements when using the CAN_DOUBLE function.
  [Channel name]
  Sets the channel name within 20 characters (optional).
  For not using, set “0.”
  [Calibration coefficient/offset]
  Multiplier (Calibration coefficient: A) and additional value (Offset: B) are used for converting the cutout data into physical quantity. Sets A and B in the double precision floating decimal point variable (Double). Suppose the cutout data is X. The physical quantity to be converted (Y) is Y = AX + B.

(7) Unit No.
Sets the unit of the converted physical quantity, based on the above item (5) Calibration coefficient/offset in the "8-4-4 CAN information (CH1 to CH256)", to Unit No.
0 to 62
For details, see "9. UNIT NO. AND UNIT CHARACTER STRING."

8-5 CUSTOM-MADE CABLE CORRECTION VALUES AND INPUT CABLE

When using the CDV-40B/A series and CVM-40A/41A series, select the following input cable No.
(Shaded portions indicate initial values.)

Input cable No.	CDV-40B/A series	CVM-40A/41A series
0	Unspecified	Unspecified
1	U-40 to 48 (0.5 m)	U-121 (0.5 m)
2	U-39 (1.0 m)	U-122 (1.0 m)
3	U-38 (1.5 m)	U-123 (1.5 m)
4	Custom-made cable	Custom-made cable

When using conditioner cards (excluding the CDV-40B/A series and CVM-40A/41A series), select the input cable No. “0 (Unspecified).”
When the input cable No. is “4 (custom-made cable)”, enter the custom-made cable correction values “-1 to 49.”
When the input cable No. is not “4 (custom-made cable)”, enter the custom-made cable correction values “0”.
Input ranges of the custom-made cable correction values are -1 to 49.

NOTE

- If you use this function,the EDX-100A software version should be version 01.45 or higher.
- The internal sensitivity compensation uses the input cable No. and custom-made cable correction values. After changing the input cable No. and custom-made cable correction values, be sure to execute the internal sensitivity compensation again.

MEMO

- The custom-made cable correction values are as follows.
  Custom-made cable correction value = (Indicating value of the DCS-100A cable correction value) -1
- When using the CDV-40B/A series and CVM-40A/41A series with the input cable No. “0 (Unspecified)”, based on the custom-made cable correction value, the input cable No. will be changed.
  Custom-made cable correction value: 0 — The input cable No. will be changed to 2 (1.0 m).
  Custom-made cable correction value: Not 0 — The input cable No. will be changed to 4 (custom-made cable).

9. UNIT NO. AND UNIT CHARACTER STRING

Unit No. and unit character string used in the EDX are responding to each other as described in the following table.
Unit character string may partially differ according to setting of “KS2 based language” (Japanese or English) of measuring condition parameter. (See “8-1.”)
Unit Nos. 60 to 62 are User defined units.

No.	Unit character string		No.	Unit character string	
	Japanese	English		Japanese	English
0	με	um/m	32	%	
1	ε	e	33	dB	
2	mV		34	ppm	
3	V		35	cm/s	
4	mA		36	m/s	
5	A		37	m/min	
6	mm		38	km/h	
7	cm		39	Hz	
8	m		40	kHz	
9	℃	degC	41	MHz	
10	℉	degF	42	°	deg
11	gf/cm2		43	deg	
12	kgf/mm2		44	rad	
13	kgf/cm2		45	kN	
14	kgf/m2		46	kNm	
15	mmHg		47	kW	
16	kPa		48	rpm	
17	MPa		49	cm/s2	
18	g		50	m/s2	
19	Kg		51	G	
20	ton		52	daN	
21	gf		53	mile/h	
22	kgf		54	*100kpa	
23	tonf		55	deg/s	
24	N		56	msec	
25	kgf·mm	Kgf.mm	57	sec	
26	kgf·cm	Kgf.cm	58	min	
27	kgf·m	Kgf.m	59	hour	
28	Nm		60	(User defined unit)	
29	Ω	OHM	61	(User defined unit)	
30	kΩ	kOHM	62	(User defined unit)	
31	MΩ	MOHM			

10. CARD TYPE NO. AND SET VALUE OF CONDITIONER CARD

10-1 LIST OF CARD TYPE NO.

Card type Nos. used in commands and condition files are listed in the following table.

Card type No.	Card Name	Remarks
0	No card	
1	Unknown card	
2	CDV-40A	
3	(Reserved)	(*1)
4	(Reserved)	(*1)
5	CAN-40A	
6	CTA-40A	
7	(Reserved)	(*1)
8	DPM-42A	
9	CCA-40A	
10	CFV-40A	
11	(Reserved)	(*1)
12	(Reserved)	(*1)
13	Not applicable card	Installation slot error
14	CDV-40A-F	
15	DPM-42A-F	
16	CCA-40A-F	
17	(Reserved)	(*1)
18	(Reserved)	(*1)
19	(Reserved)	(*1)
20	(Reserved)	(*1)
21	(Reserved)	(*1)
22	(Reserved)	(*1)
23	CAN-41A	
24	(Reserved)	(*1)
25	(Reserved)	(*1)
26	DPM-42B-I	
27	DPM-42B-I-F	
28	DPM-42B	
29	DPM-42B-F	
30	CDV-40B	
31	CDV-40B-F	
32	(Reserved)	(*1)
33	(Reserved)	(*1)
34	(Reserved)	(*1)
35	CDV-44AS	

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Card type No.	Card Name	Remarks
36	(Reserved)	(*1)
37	CDA-44AS	
38	CDA-45AS	
39	CVM-40A	
40	(Reserved)	
41	AD-40AS	
42	AD-40AS-F	
43	(Reserved)	(*1)
44	(Reserved)	(*1)
45	CVM-41A	
46	(Reserved)	(*1)
47	CDV-46AS	
48	(Reserved)	(*1)

(*1) When System reserve No. is returned from the EDX, the card is a custom-made card.

10-2 SET VALUE OF CONDITIONER CARD

Set values of conditioner cards are listed in the following table.
(Shaded portions are initial values set by INI command.)

Card type	Card type No.	2: CDV-40A 14: CDV-40A-F 30: CDV-40B 31: CDV-40B-F		10: CFV-40A	6: CTA-40A	
Mode		0: Strain	1: Voltage	0: ZC/S 1: ZC/N 2: TTL	0: K (ON) 1: K (OFF)	2: T (ON) 3: T (OFF)
Range		0: 500 uε 1: 1k uε 2: 2k uε 3: 5k uε 4: 10k uε 5: 20k uε 6: 50k uε 7: OFF	0: 0.1 V 1: 0.2V 2: 0.5V 3: 1.0V 4: 2.0V 5: 5.0V 6: 10.0 V 7: OFF	0: 50 Hz 1: 100 Hz 2: 500 Hz 3: 1k Hz 4: 2k Hz 5: 5k Hz 6: 10k Hz 7: 20k Hz 8: OFF	0: 240degC 1: 480degC 2: 1230degC 3:OFF	0: 210degC 1: 400degC 2:OFF
Low pass filter		0: FLAT 1: 10k Hz 2: 3k Hz 3: 1kHz 4: 300 Hz 5: 100 Hz 6: 30 Hz 7: 10 Hz 8: AUTO (CDV-40A-F and CDV-40B-F only)		***	***	
High Pass Filter		0: OFF 1: 0.2Hz 2: 1Hz		0: OFF 1: ON	***	
CAL Range		0: 100% 1: 50% 2: SHUNT	0: 100% 1: 50%	0: 100% 1: 50%	0: 100% 1: 50% 2: CHECK	

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Card type	Card type No.	9: CCA-40A 16: CCA-40A-F	8: DPM-42A 15: DPM-42A-F 28: DPM-42B 29: DPM-42B-F 26: DPM-42B-I 27: DPM-42B-I-F	
Mode		0: Voltage 1: Reserve	0: BV (2.0 V)	1: BV (0.5 V)
Range		0: 20 mV 1: 50 mV 2: 100 mV 3: 200 mV 4: 500 mV 5: 1000 mV 6: 2000 mV 7: 5000 mV 8: OFF	0: 200 uε 1: 500 uε 2: 1k uε 3: 2k uε 4: 5k uε 5: 10k uε 6: 20k uε 7: OFF	0: 1k uε 1: 2k uε 2: 5k uε 3: 10k uε 4: 20k uε 5: 50k uε 6: OFF
Low pass filter		0: FLAT 1: 10k Hz 2: 3k Hz 3: 1kHz 4: 300 Hz 5: AUTO (CCA-40A-F only)	0: FLAT 1: 1k Hz 2: 300 Hz 3: 100 Hz 4: 30 Hz 5: 10 Hz 6: AUTO (DPM-42A-F, DPM-42B-F, and DPM-42B-I-F only)	
High Pass Filter		***	***	
CAL Range		0: DC100% 1: DC50% 2: AC100% 3: AC50%	0: 100% 1: 50% 2: SHUNT	

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Card type	Card type No.	35: CDV-44AS		37: CDA-44AS 38: CDA-45AS	
Mode		0: Strain (ON) 1: Strain (OFF)	2: Voltage (ON) 3: Voltage (OFF)	0: Strain (ON) 1: Strain (OFF)	2: Voltage (ON) 3: Voltage (OFF)
Range		0: 500 uε 1: 1k uε 2: 2k uε 3: 5k uε 4: 10k uε 5: 20k uε 6: OFF	0: 1.0 V 1: 2.0 V 2: 5.0 V 3: 10.0 V 4: 20.0 V 5: 50.0 V 6: OFF	0: 500 uε 1: 1k uε 2: 2k uε 3: 5k uε 4: 10k uε 5: 20k uε 6: OFF	0: 1.0 V 1: 2.0 V 2: 5.0 V 3: 10.0 V 4: 20.0 V 5: 50.0 V 6: OFF
Low pass filter		0: FLAT 1: 1k Hz 2: 300 Hz 3: 100 Hz 4: 30 Hz 5: 10 Hz		0: FLAT 1: 100 Hz 2: 30 Hz 3: 10 Hz 4: 3 Hz 5: 1 Hz	
High Pass Filter		0: OFF 1: 0.2 Hz		0: OFF 1: 0.2 Hz	
CAL Range		0: 100% 1: 50% 2: SHUNT	0: 100% 1: 50%	0: 100% 1: 50% 2: SHUNT	0: 100% 1: 50%

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Card type	Card type No.	47: CDV-46AS		41：AD-40AS 42：AD-40AS-F
Mode		0: Strain (ON) 1: Strain (OFF)	2: Voltage (ON) 3: Voltage (OFF)	0: Voltage
Range		0: 2k uε 1: 5k uε 2: 10k uε 3: 20k uε 4: 50k uε 5: 100k uε 6: OFF	0: 1.0 V 1: 2.0 V 2: 5.0 V 3: 10.0 V 4: 20.0 V 5: 50.0 V 6: OFF	0:5 V 1:10 V 2:OFF
Low pass filter		0: FLAT 1: 1k Hz 2: 300 Hz 3: 100 Hz 4: 30 Hz 5: 10 Hz		0: FLAT 1: 10k Hz 2: 3k Hz 3:1kHz 4: 300 Hz 5: 100 Hz 6: 30 Hz 7: 10 Hz 8:AUTO(AD-40AS-F only)
High Pass Filter		0: OFF 1: 0.2 Hz		***
CAL Range		0: 100% 1: 50% 2: SHUNT	0: 100% 1: 50%	0:TEST

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Card type	Card type No.	39: CVM-40A			
Mode		0: Strain (2 V)	1: Strain (5 V)	2: Voltage 3: Voltage (2 V) 4: Voltage (5 V)	5: Piezoelectric
Range		0: 5k uε 1: 10k uε 2: 50k uε 3: 100k uε 4: 500k uε 5: OFF	0: 5k uε 1: 10k uε 2: 50k uε 3: 100k uε 4: 200k uε 5: OFF	0: 1.0 V 1: 5.0 V 2: 10.0 V 3: 50.0 V 4: OFF	0: 100 mV 1: 500 mV 2: 1000 mV 3: 5000 mV 4: OFF
Low pass filter		0: FLAT 1: 3k Hz 2: 1k Hz 3: 300 Hz 4: 100 Hz 5: 30 Hz 6: AUTO			
High Pass Filter		0: OFF 1: 0.2 Hz 2: 1 Hz			***
CAL Range		0: 100% 1: 50% 2: SHUNT	0: 100% 1: 50%		0: DC100% 1: DC50%

Card Type	Card type No	45:CVM-41A				
Mode		0: Strain (2 V)	1: Strain (5 V)	2: Strain (10 V)	3: Voltage 4: Voltage (2 V) 5: Voltage (5 V) 6: Voltage (10 V)	7: Piezoelectric
Range		0:2k uε 1:5k uε 2:10k uε 3:20k uε 4:50k uε 5:100k uε 6:200k uε 7:500k uε 8:OFF	0:2k uε 1:5k uε 2:10k uε 3:20k uε 4:50k uε 5:100k uε 6:200k uε 7:OFF	0:2k uε 1:5k uε 2:10k uε 3:20k uε 4:50k uε 5:100k uε 6:OFF	0:1.0 V 1:2.0 V 2:5.0 V 3:10.0 V 4:20.0 V 5:50.0 V 6:OFF	0:100 mV 1:200 mV 2:500 mV 3:1000 mV 4:2000 mV 5:5000 mV 6:OFF
Low pass filter		0:FLAT 1:3k Hz 2:1k Hz 3:300 Hz 4:100 Hz 5:30 Hz 6:AUTO				
High Pass Filter		0:OFF 1:0.2 Hz 2:1 Hz				***
CAL Range		0:100% 1:50% 2:SHUNT			0:100% 1:50%	0:DC100% 1:DC50%