EM31 DATA CONVERSION AND COMPUTER INTERFACE BOARD

DESCRIPTION

The optional data conversion and computer interface module converts the analog INPHASE and CONDUCTIVITY signals from EM31 receiver into digital data and sends the data together with other information to a data logging computer via the on-board RS-232 port. The conversion and sending are automatic and continuous, no trigger is needed.

INTERFACE CABLE

The RS-232 port is provided via a 10-pin circular socket mounted on the EM31 panel. A 10-position circular connector to 9-position sub-D female connector cable is supplied with each system for connection between EM31 and the data logging computer.

Only two lines are used from the one-way RS-232 communication. These two lines are:

10-pin circular from EM31	9-pin sub-D to computer	function
PIN H	pin 5	GROUND
PIN K	pin 2 (RXD)	RS-232 DATA

RS-232 CONFIGURATION

The port is configured as a Date Communication Equipment. No handshaking is used. It is initialized as follows:

Baud rate:	9600
parity:	none
data bits:	8
stop bit:	1

DATA RATE

10 records per second (approximate)

EM31 DATA RECORD FORMAT

Each data record consists of 13 bytes detailed below:

Byte 1 (ASCII)   " T " -- start byte

Byte 2 (information byte. See next section for marker, mode
                   and range interpretation.)

Byte 3 (ASCII)   + or -, sign of conductivity

Byte 4 (ASCII)   thousand's of conductivity

Byte 5 (ASCII)   hundred's of conductivity

Byte 6 (ASCII)   ten's of conductivity

Byte 7 (ASCII)   one's of conductivity

Byte 8 (ASCII)   + or -, sign of inphase

Byte 9 (ASCII)   thousand's of inphase

Byte 10 (ASCII)   hundred's of inphase

Byte 11 (ASCII)   ten's of inphase

Byte 12 (ASCII)   one's of inphase

Byte 13 (ASCII)   carriage return

INFORMATION BYTE INTERPRETATION

The bit format of the information byte is:

BIT DECIMAL   VALUE OR MEANING

BIT	DECIMAL	VALUE OR MEANING
7	128	1
6	64	MARKER = 1 when trigger switch is pressed
		= 0 otherwise
5	32	MODE = 1 vertical dipole mode operation
		= 0 horizontal dipole mode operation
4	16	0
3	8	0
2	4	RANGE 3
1	2	RANGE 2
0	1	0

MULTIPLICATION FACTORS

RANGE 3 and RANGE 2 represent the sensitivity as follows:

Both components (**OPER** mode)

SENSITIVITY	RANGE 2	RANGE 3	MULTIPLICATION FACTOR	
10	1	0	Conductivity	**-0.25**
100	0	1	Conductivity	**-0.025**
1000	1	1	Conductivity	**-0.0025**

Multiplication factor for Inphase is **-0.025** (all ranges).

Inphase component (**COMP** mode)

SENSITIVITY	RANGE 2	RANGE 3	MULTIPLICATION FACTOR	
10	1	0	Inphase	**-0.0625**
100	0	1	Inphase	**-0.00625**
1000	1	1	Inphase	**-0.000625**

Conductivity is not recorded in COMP mode. In this mode Inphase is recorded in the field of conductivity reading (ASCII Bytes 3, 4, 5, 6, 7), Inphase field (ASCII Bytes 8, 9, 10, 11, 12) is not used.

Multiply readings by above factors to obtain results in mS/m and ppt.

If the EM31-SH (2 m boom) is used then divide Inphase further by factor of 3.35.