

EM-38MK2 DATA PROTOCOL

February 2008 (Revised Aug, 2015)

DESCRIPTION

The data from EM38MK2 is transmitted to a data logging computer via a RS-232 port. The conversion and sending are automatic and continuous, no trigger is needed.

PORT AND CABLE PIN ASSIGNMENT

The computer interface port is provided via a 3-pin circular lemo socket mounted on the EM38MK2 panel. A 3-pin circular connector to 9-pin sub-D connector cable is supplied with each system for connection between EM61MK2 and the default controlling unit POLYCODER. The same cable can be used to connect EM38MK2 to other computer or data acquisition system provided that such computer or system has an RS-232 port.

EM38MK2 INTERFACE CABLE functions are summarised as follows:

3-pin connector EM61MK2	9-pin sub-D POLY/COMPUTER	function
2	5	GROUND
3	2 (input)	RS-232 RXD
1		MARKER

RS-232 CONFIGURATION

The port is configured as a Data Communication Equipment. No handshaking is used. It is initialise as follows:

Baud rate:	19200
parity:	none
data bits:	8
stop bit:	1

DATA RATE

20 records per second (approximate)

EM38 DATA RECORD FORMAT

There are 4 channels of data for 1M and 0.5M I-phase and Q-phase information. There are other 2 channels for 1M and 0.5M coil temperature information. Each channel has 2 byte.

Each data record string consists of 16 bytes detailed below:

- Byte 1 (ASCII) " T " -- start byte
- Byte 2 (information byte. See next section for marker, mode, Interpretation.)
- Byte 3 Channel 1 High Byte
- Byte 4 Channel 1 Low Byte
- Byte 5 Channel 2 High Byte
- Byte 6 Channel 2 Low Byte
- Byte 7 Channel 3 High Byte
- Byte 8 Channel 3 Low Byte
- Byte 9 Channel 4 High Byte
- Byte 10 Channel 4 Low Byte
- Byte 11 Channel 5 High Byte
- Byte 12 Channel 5 Low Byte
- Byte 13 Channel 6 High Byte
- Byte 14 Channel 6 Low Byte
- Byte 15 FF (High End Byte FOR END)
- Byte 16 FF (Low End Byte FOR END)

INFORMATION BYTE INTERPRETATION

The bit format of the information byte is:

BIT	VALUE OR MEANING
7	0
6	0

5
4 0
3 0
2 MODE (= 1 for vertical operation
 = 0 for horizontal operation)
1 MARKER (= 0 when trigger/marker switch is pressed,
 = 1 otherwise)
0 0

CHANNEL INFORMATION

Channel 1 ----- Q/P FOR 0.5 m
Channel 2 ----- I/P FOR 0.5 m
Channel 3 ----- Q/P FOR 1 m
Channel 4 ----- I/P FOR 1 m
Channel 5 ----- TEMPERATURE FOR 1 m
Channel 6 ----- TEMPERATURE FOR 0.5 m

DATA INFORMATION (for Channel 1~4)

-160mV=0000HEX; OV = 8000HEX; 160mV=FFFFHEX
1mV=8mS/m
(1mS/m=25.6 raw data)

or:

Conductivity(for 0.5m in mS/m)=(Ch1_data*5/1024-160)*8
Inphase (for 0.5m in ppt) =(Ch2_data*5/1024-160)*8*0.00720475
Conductivity(for 1.0m in mS/m)=(Ch3_data*5/1024-160)*8
Inphase (for 1.0m in ppt) =(Ch4_data*5/1024-160)*8*0.028819

Note:

Converted data file in DAT38MK2 format (M38) contains other sequence:
 Conductivity 1.0m, Inphase 1.0 m, Conductivity 0.5m,
 Inphase 0.5m, Temp 1.0m, Temp 0.5m

Temperature Data (for Channel 5~6)

0v=0000 HEX; 5V=ffff HEX
10mV/C°; 750mV=25C°

temperature=data/3.103-50 for both 0.5m and 1.0m
 (end)