Manual

MicroLogger

Model 8010

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1.0   INTRODUCTION

The 8010A MicroLogger is an OEM product from Unidata designed to allow quick interfacing to a range of sensors. It is supplied as a populated PCB.

The 8010A is program compatible with the Starlogger and supports many of its extended features such as SDI-12 and HSIO communications.

The 8010A incorporates design features to minimize EMR susceptibility.

2.0   SPECIFICATIONS

Memory: 128K RAM and reprogrammable 32K EEPROM.

Supercap or Lithium battery backup option.

Indicator: LED scan indicator.

Inputs/Outputs: All inputs and outputs feature EMI suppression.

1 x 16 bit Counter Channel.

4 x Analog Channels.

A0 and A1 - Hi-res 0...2.5V scaled 1.221mV/bit.

A4 and A5 - Hi-res 0...5.0V scaled 1.221mV/bit*.

2 x Digital Inputs (Potential Free) Log Start*, SENSE 1.

1 x SDI-12/High Speed Serial I/O channel.

1 x 3-wire HSIO Serial I/O channel (14-way ribbon cable and OEM connector).

1 x Open Collector control output OUT 0.

RS-232 connector (10-way ribbon cable connector. Can interface to DB-9 connector (off PCB)).

Precision 5V reference scan synchronised with pre-scan. Analog and digital ground.

Power Outputs: UPS (User Power Supply) can be regulated to any voltage up to that of the battery (700mA max).

+12V scan sync. external power*.

+12V fused input/output power (1.1A resettable fuse)*.

Power: 3-pin battery pack connector.

+12V fused input/output power (1.1A resettable fuse)*.

Operating voltage 6.8 to 18VDC (6V if 5V Ref is not required).

Operating current: 60mA. Standby current: 50µA.

Battery voltage measurement (100mV/bit) A2.

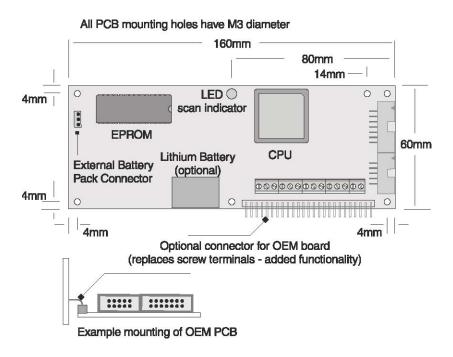Low battery detect and shutdown (hardware and firmware).

 UPS instruction to control UPS synchronization.

*Only available on OEM connector.

3.0   MOUNTING

The 8010A is designed to mount in the OEM's enclosure. Alternatively Unidata can supply an IP67 polycarbonate enclosure with the dimensions of 80 x 230 x 65 millimetres (W x L x H).

Unidata sales representative can assist with custom designs.

4.0   SIGNAL CONNECTIONS

J4	14-Way Screw Terminal Connector
Pin	**Description**
1	+5V Scan/Pre-scan synchronised UPS (Counter 2 not used) (OUT)
2	Power/Digital Ground
3	OUT 1(Open collector) (OUT)
4	SENSE 0 Log-start (IN)
5	Power/Digital Ground
6	Counter 0 (IN)
7	Analog 5V Referance (OUT)
8	Analog Channel 0 (IN)
9	Analog Ground
10	Analog Channel 1 (IN)
11	+12V Battery/Power input (6.8–18VDC) (IN)
12	SDI-12 (Bi-Directional)
13	Power/Digital Ground
14	Reserved (Chassis)

CN24	3-Way Battery Connector
Pin	**Description**
1	Reserved
2	+12V Battery/Power input (6.8–18VDC) (IN)
3	Power/Digital Ground

J5	25 -Way OEM Header Connector
Pin	**Description**
1	+12V Scan synchronised UPS (optional if Out 1 not used) (OUT)
2	Reserved
3	+5V Scan/Pre-scan synchronised UPS (Counter 2 not used) (OUT)
4	Power/Digital Ground
5	SENSE 0 Log-start (IN)
6	OUT 1(Open collector) (OUT)
7	SENSE 1(IN)
8	Reserved
9	Power/Digital Ground
10	Counter 0 (IN)
11	Analog Channel 5 (IN)
12	Analog 5V Referance (OUT)
13	Analog Channel 0 (IN)
14	Analog Channel 4 (IN)
15	Analog Ground
16	Analog Channel 1 (IN)
17	+12V Battery/Power input (6.8–18VDC) (IN)
18	+12V Battery/Power input (6.8–18VDC) (IN)
19	SDI-12 (Bi-Directional)
20	Ext. Power 6.8 –18VDC (1.1A Resettable Fuse) (Bi-Directional)
21	Power/Digital Ground
22	HSIO Sync (optional if UPS not used) (OUT)
23	HSIO Data (Bi-Directional)
24	HSIO Clock (OUT)
25	Reserved (Chassis)

CN20	14-Way HSIO Box Head Connector
Pin	**Description**
1	Reserved (+12V internal power bus - Bi-Directional)
2-8	Reserved
9	HSIO Sync (optional if UPS not used) (OUT)
10	HSIO Data (Bi-Directional)
11	HSIO Clock (OUT)
12	Ext. Power 6.8 –18VDC (1.1A Resettable Fuse) (Bi-Directional)
13	Power/Digital Ground
14	Power/Digital Ground

CN21	10-Way RS232 Box Head Connector
Pin	**Description**
1	Reserved
2	RS232 DSR to computer (OUT)
3	RS232 TX Data to computer (OUT)
4	RS232 RTS from computer (IN)
5	RS232 Rx Data from Computer (IN)
6	Reserved
7	Reserved
8	Reserved
9	Power/Digital Ground
10	Reserved

NOTE: Connector CN21 is designed to mate with 10-way ribbon cable and IDC DB9 connector

5.0   THE USER POWER SUPPLY (UPS)

In the V3 MicroLogger has two user power supplies available, a 5V Scan/Pre-scan synchronised supply, and a 12V Scan-only synchronised supply. The 5V supply precludes the use of the second counter (Counter 2).

The 5V UPS may be used in two modes. The default mode switches the UPS on every scan, with the pre-scan defined in the CDT (default 15ms). The other way is to enable the UPS as programmable (set Byte 10, Bit 3 of the CDT). In this mode, the UPS Instruction is available to control the timing of the output.

The UPS Instruction has this form (op-code 132):

```
UPS, #_of_ON_scans, Pre-scan_in_15.625ms_(lsb/msb)
```

# of On scans =   0 = UPS remains OFF

```
                1 = UPS ON next scan only

                2-255 = UPS ON next 2...255 scans

                Pre-scan = 0 = UPS turns ON after I/O measurement

                1 = UPS turns ON at I/O measurement (no prescan)

                2 = UPS turns ON 15ms before I/O measurement
```

5.1   Worked Example

132, 4, 64, 0

This example instruction switches ON the UPS 1 sec (64 * 15ms) before the next scan and leaves the UPS ON for 3 more Scans (4 in total).

Pulse and Switch Instructions – Pulse (op-code 24/26) and Switch (op-code 25/27) instructions can be used to program the UPS (Channel #1) if the UPS is configured in programmable mode (see above). (Channel #0 is the open collector.

6.0   SOFTWARE COMPATABILITY

The V3 MicroLogger can in most cases be treated as a STARLOGGER. Note that the "Log Start" signal must be linked to ground or that the test in the scheme needs to be removed.

Instrument scaling is the same as a V2 Micrologger and STARLOGGER.

The Battery Voltage is not available as a Lo-Res channel (there is not enough range to store it).

Using Version 2 – Program it as a STARLOGGER.

Using Version 3 – Define your own Logger structure for an "8010 MicroLogger".

7.0   REGISTER ALLOCATION

The Model 8010 MicroLogger, operating the standard instruction set, has the following fixed memory assignments in the Hardware Register:

Address	Size	Description
0	1	Software Revision Number (20 onwards)
1	2	Logger runtime in milliseconds (16 bit integer)
3	1	Error flags
4	4	Logger scan counter (32 bit integer)
8	1	Reserved
10	1	Reserved
11	2	msb of address (bits 8-23) used in LDBLK and MVBLK instructions
13	2	Reserved
14	1	Binary states of analog channels
16	1	Analog channel (a0) unsigned low resolution representation (8 bit)
17	1	Analog channel (a1) unsigned low resolution representation (8 bit)
24	2	Counter channel (C0) 16-bit
32	1	Digital input values (normally high) Bit 3 Log Start Detect: Bit set=not detected Bit 6 High speed serial Data 0
33	1	User Power Supply status register Bit 0 = 1 UPS will be ON next scan Bit 1 = 1 UPS was ON for this scan Bit 2 = 1 UPS is currently ON Bit 7 = 1 (set by log program) to synchronize UPS to come on next scan (auto reset).
34	1	Arithmetic status register set by ADD, SUB, MUL,DIV instructions. Bit 2 = Arithmetic overflow Bit 7 = Arithmetic carry Logic status register set by CMP (compare) instruct. Bit 4 set Operand 1 =Operand 2 Bit 5 set Operand 1 < Operand 2 (unsigned) Bit 6 set Operand 1 < Operand 2 (signed)
35	1	Reserved
80	6	Version 2 Software stores Scheme Name here.
200	2	Analog channel (A0) signed 16 bit channel
202	2	Analog channel (A1) signed 16 bit channel
204	2	Battery voltage measurement (A2)
208	2	Analog channel (A4) signed 16 bit channel
210	2	Analog channel (A5) signed 16 bit channel