

# SM330 Andon System Data Logger Notes.

Version 2.0 February 2016

## General Description

This system monitors the radio traffic between the various stations located around a plant and the central control panel. A small packet of data is generated whenever any button is pressed within the system. For redundancy purposes, this packet is sent four times in quick succession.

Each data packet contains information on Station identity, button pressed (department) and an action, such as starting or stopping an alert. It also contains data integrity characters to allow receiving stations to confirm the accuracy of the data packet.

The SM330 Data Logger program resides in a PC in a folder called **C:\SM330 Logger**.

Within that folder there is a sub-folder called **Data** that contains the active database file called **ANDON\_LOG.mdb** and a Settings database file called **SETTINGS.mdb** which is used for system settings within the program.

When the program records station activity a fresh record is generated and appended to the **ANDON\_LOG.mdb** file. When the file reaches a predefined number of records (as held in the SETTINGS file) the data file is automatically archived and placed in a separate sub folder under **C:\SM330\DATA\** called **BACKUP**. These backup files will therefore contain a fixed number of records. They are saved with an incremental number added to each file to prevent accidental over-writing of files. For example: **ANDON\_LOG\_001.mdb, ANDON\_LOG\_002.mdb....**

These files can be read by a local program or remote program such as Excel for statistical analysis.

## The SM330 Program

This program is an executable file residing in the folder C:\SM330 Logger\. The PC is configured to automatically execute this program upon re-start of the PC. An icon also appears on the desktop area of the PC to allow the application to be stopped and re-started as required.

REC	DATE/TIME	STN	DEPARTMENT	ACTION
1	24/02/2016 3:08:14 PM	0	First Aid	Standard Alert
2	24/02/2016 3:08:28 PM	0	First Aid	Alert Cancelled
3	24/02/2016 3:08:38 PM	0	Engineering	Alert Cancelled
4	24/02/2016 3:08:44 PM	0	Engineering	Standard Alert
5	24/02/2016 3:08:51 PM	0	Logistics	Standard Alert
6	24/02/2016 3:08:55 PM	0	Logistics	Alert Cancelled
7	24/02/2016 3:09:03 PM	0	Supervisor	Alert Cancelled
8	24/02/2016 3:09:07 PM	0	Supervisor	Standard Alert
9	24/02/2016 3:34:04 PM	0	Supervisor	Standard Alert
10	24/02/2016 3:34:46 PM	0	Supervisor	Alert Cancelled
11	24/02/2016 3:34:59 PM	0	Supervisor	Standard Alert
12	24/02/2016 3:35:41 PM	0	Supervisor	Alert Cancelled
13	24/02/2016 3:35:50 PM	0	Supervisor	Standard Alert
14	24/02/2016 3:36:28 PM	0	Supervisor	Alert Cancelled

As information arrives it appears in a holding area (highlighted above in green) before being added to the end of the active data file. The screen shows a receiving activity window which usually contains junk data from atmospheric noise on the radio receiver. The program will search this signal for patterns of data that it can use.

Whenever a fresh record is added to the data file the PC sounds a chime. This sound may be suppressed by un-checking the 'Chime on Record' box on the screen.

## Diagnostic View

When the Diagnostic View box is checked the database screen is blanked and a diagnostic area is revealed that shows the raw data as it arrives in the program and checked for integrity. (Data is still being processed and stored even though the database screen is not visible.)

The screenshot shows the 'SM330 ANDON Logger' interface. At the top, it displays the 'JALIAN' logo, the title 'SM330 ANDON LOGGER', and version information 'Ver 2.0 Feb 2016'. The main area is divided into several sections:

- Station Information:** Station: 01, Department: Supervisor, Action: Standard Alert, Date: 24/02/2016, Time: 3:34:58 PM.
- Received Data Table:** A table with 11 columns and 11 rows of data, including fields like Start 01, Start 02, CR, LF, Repeat, Addr Tens, Addr Units, Lamp No., Contol Code, Checksum MSB, Checksum LSB, Checksum total, Checksum calc, and Checksum valid.
- Control Panel:** Includes buttons for Stop, Setup Menu, and Exit. There are also checkboxes for 'Receiving', 'Chime on Record', 'Diagnostic View', and 'Block Logging'.

A third check box on the main screen is labelled Block Logging. When this box is checked, the program will continue to receive data but no records will be added to the data file. It may be used for system testing and demonstration purposes, without recording results.

## The Setup Menu Page

If the program is stopped by pressing the **STOP** button the **EXIT** button and **SETUP MENU** buttons are revealed. The **EXIT** button cancels the application and returns the user to the Windows desktop area.

The **SETUP MENU** button brings up a password window on the screen. The password for this is **NODNA** (Andon backwards). When entered correctly (within 10 seconds) a Setup Menu page will appear.

The screenshot shows the 'Setup Menu' page of the 'SM330 ANDON Logger'. The page is titled 'Setup Menu' and contains several configuration options:

- Comm Port:** 4 (For communications with Andon receiver)
- Record Limit:** 100 (Trigger for archive of active Log file)
- Backup Count:** 41 (Incremental number of last backup file)
- Data Folder:** C:\SM330 Logger\Data\
- Backup Folder:** C:\SM330 Logger\Data\Backup\
- Button Titles:** Title 1: Supervisor, Title 2: Logistics, Title 3: Engineering, Title 4: First Aid, Title 5: n/a

At the bottom, there are buttons for Start, Setup Menu, and Exit, along with checkboxes for 'Chime on Record', 'Diagnostic View', and 'Block Logging'.

The first item is the number of the active serial communications port that is being used to communicate with the SM330 Receiver unit. This should not be changed unless the program is being set up on a new PC.

The **Record Limit** is the number of records that will be accumulated before the file is copied to the backup area and the working log file (ANDON\_LOG.mdb) is erased back to zero records.

A button labelled **FORCE ARCHIVE** can be pressed at any time to force an archiving event even though the record quantity threshold has not yet been reached.

The **Backup Count** reference cannot be changed. It is an internal counter that is used to ensure that every archive file created will have an incremental file name, so that valid data cannot accidentally be overridden.

The remaining two fields contain the active paths for the working database and the backup or archiving area.

To return to the main screen click the **BACK** button. The logging of received information will recommence when the **START** button is pressed within the program.

### Fields of information

The Microsoft Access data files consist of six fields of information.

RECORD	(numeric)
DATE	(Date/time)
SOURCE	(numeric)
STATION	(numeric)
DEPARTMENT	(TEXT)
ACTION	(TEXT)

The **RECORD** field is a self-incrementing number that counts the record as it is added to the file.

The **DATE** field is a Date & Time stamp that records (by PC time) when the record was added.

The **SOURCE** field is a 2-digit numeric expression of both DEPARTMENT and ACTION.

The first digit of **DEPARTMENT** is encoded as follows:

1 = Title1	(as per Button Titles 1 field in the Setup page)
2 = Title2	(as per Button Titles 2 field in the Setup page)
3 = Title3	(as per Button Titles 3 field in the Setup page)
4 = Title4	(as per Button Titles 4 field in the Setup page)
5 = Title5	(as per Button Titles 5 field in the Setup page)

The second digit of **ACTION** is encoded as follows:

0 = Alert Cancelled
1 = Standard Alert
2 = Urgent Alert
3 = Confirmed

For example a value of **31** in the **SOURCE** field represents a **Standard Alert (1)** for the Third department in the Title list (**3**).

The **STATION** field contains the number of the station that generated the alert condition.

The remaining two fields of **DEPARTMENT** and **ACTION** are plain text equivalents of the information held in the **SOURCE** field.

## Installation Notes for the Data Logger system

### The Computer

There are some important considerations for the PC used to collect the data for the logger:

- ◆ The PC must operate in a Windows environment. Any version from XP to Windows 10 should be satisfactory.
- ◆ It should be reasonably fast in order to process the incoming data quickly. Machines more than say 5 years old may have trouble keeping up with processing incoming signals.
- ◆ The PC should be configured so that it does not go to sleep after a certain amount of time. This is set via the Control Panel 'Power Settings' config. area. (It is ok if the screen is set to go blank after a time interval, as information will still be logged)
- ◆ A UPS (uninterruptible Power Supply) fitted to the PC will ensure that the logger does not re-boot during minor power outages. A good alternative is to setup a Notebook PC as the data logger, as its internal battery then acts as something of a UPS.
- ◆ At least one free USB port should be available.

### Program Folders

A folder should be created under the C:\ root directory. This is: **C:\SM330 Logger**.

Within this new folder, a second folder called **C:\SM330 Logger\Data** should be created. Under the Data folder, a third sub-folder called **C:\SM330 Logger\Data\Backup** should be created. This folder will eventually hold all archived Microsoft access files from the logger program.

The memory stick provided will have the same folder structure on it. It is sufficient to just drag a copy of the **(memory stick):\SM330 Logger** folder onto the **C:\** area of the target PCm then all necessary sub-folders are automatically created.

In the: **C:\SM330 Logger**. Folder there should be the application program of **SM330 ANDON logger v2.exe**. For convenience, right-click on this file and create a shortcut for this program that is then placed on the PC desktop area for ease of access. Also consider placing a copy of this shortcut in the STARTUP area of the Windows menu system, so that the logger program will automatically execute whenever the PC is restarted.

### USB Connection

When the RS232 to USB adapter provided is first connected, the PC will automatically allocate a Comm Port designation to it, such as Com 2 or Com 3. It is important to know what this is so that the matching Com Port number can be entered into the Setup menu of the Data Logger program. This may be viewed by searching through the **Control Panel, Device Manager** menu in the PC.

### Turning Off Automatic Serial Mouse detection

Windows PC's all have a legacy facility that allows it to detect and uses a serial (RS232) mouse. (even though these are seldom used now) This facility can interfere with the data logger operation and needs to be deactivated.

If the SM330 Data Logger receiver is already powered up and connected to the RS232 port adapter when this adapter is plugged into the PC (Or if the PC is re-booted), then the stream of receiver data will fool Windows into believing that an old Serial Port mouse has been connected.

Then this active stream of 'receiver noise' data will make the mouse pointer move all over the screen to random locations and click on random objects. It is a bizarre reaction caused by this very old feature built into Windows and it should be avoided or disabled entirely.

While the problem can be temporarily fixed simply by ensuring that the Data Logger receiver is turned off when the PC is restarted, or when the USB/RS232 adaptor is plugged into the PC, the best solution is to permanently deactivate this old Windows feature by running a command line that will update a (default) setting in Windows registry.

To do this, follow these steps:

- ◆ Click on the PC 'Start' button. Menu will pop-up, but immediately above the Start button there is a line for directly entering a command.
- ◆ In this Command line type in the following line, then press Enter.

```
REG ADD "HKLM\SYSTEM\CurrentControlSet\Services\sermouse" /V Start /T REG_DWORD /F /D 4
```

- ◆ Then re-start the PC so that the updated setting may take affect.

Thereafter, the PC will not respond to serial data arriving while its communications ports are being initialised and the 'crazy mouse' problem will be prevented.

### **Antenna Location on Data Logger**

The Data Logger receiver unit must recover signals from any button pushed on any field station, or control panel. Under ideal line-of-sight conditions, this range should be up to 700 metres. However if the receiver antenna is lying down on it side, or placed close to a metal surface, then this working range will be significantly reduced.

These pointers will help to improve data logger performance:

- ◆ Ensure that the receive antenna is vertical. (to match the polarisation of the antennas of the stations and central panel) Don't lay the receiver & antenna on its back.
- ◆ Ensure that it is not shielded by a metal frame or wall cladding, or filing cabinet, by placing the receiver above the obstruction, or a couple of metres away from the obstruction.
- ◆ Height is good. So to improve performance, consider adding an extension coax cable to lift the receive antenna higher. Alternately, locate the entire receiver higher and extend the DB9 data cable to the PC instead.

These general hints also apply to any stations and panels that may be experiencing reception problems, as the radio equipment inside these units are identical to the Data Logger receiver.

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