



EVt and N2000 Series Dataloggers

EVSW Software Quick Start Guide

Document Reference EVSWQSG.docx

Issue 2 July 25th 2016

Copyright © Comark Instruments June 2016

The information contained in this document is the intellectual property of Comark Instruments, and may not be used by any other company or individual in a form, which may be sold or used for commercial gain. The sole purpose of provision of this operator manual is to assist the requirement of a customer to program and retrieve data from an EV Logger. No liability is accepted if this results in calibrations or configurations being inadvertently overwritten.

Table of Contents

Programming the Dataloggers.....	4
Software Versions	4
EVSW – This Guide.....	4
EVSW PRO.....	4
Download and Installation Instructions.....	4
EVSW First Use	5
Language Selection	5
Logger Tasks.....	5
Quick Program.....	5
Description.....	5
Channel Configuration	6
Channel Name (Only applicable to N2015)	6
Sensor Type (N2014 Only)	6
Units.....	7
Scale Mapping (Only applicable to N2015).....	7
Resolution (Only applicable to N2015).....	7
Alarms.....	7
Log Interval	7
Logging Mode	7
Miscellaneous	8
Evolution Clock	8
Data Logger Operation	9
EVt2 Logger Operation.....	9
Before Logging has started	9
During Logging	9
After Logging has completed	9
N2000 Logger Operation	10
Connecting to your logger.....	10
External Thermistor Probes and N2000BOX.....	10

External Thermocouple Probes and N2000ADP/T or N2000ADP/K	10
Wiring N2015	10
Logging Modes	11
Manual Start/Stop Logging (N2000 Logger)	11
Manual Start/Stop Logging (Evt2 Logger).....	11
Automatic Readings with Manual or Automatic Start and Auto End.....	11
Daily Logging (N2000 Loggers Only)	11
Taking Interim Readings (N2000 Only).....	11
Data Retrieval	11
<i>Accessories</i>	<i>12</i>
<i>Maintenance</i>	<i>13</i>
Care of Diligence EV Loggers	13
Battery Replacement (N2000)	13

Programming the Dataloggers

This guide provides an over view of programming the loggers using the EV Software. To gain a more complete overview and detailed instructions, please refer to the EVSW User Guide which can be downloaded from the Support Pages of any Diligence Logger, on the Comark Website, or download from the EVSW software itself.

Software Versions

There are two versions of EVSW Software. This QSG refers solely to the EVSW Standard version.

EVSW – This Guide

EVSW is the standard version of the software and is aimed at all but 21 CFR Part 11 users, who should use the EVSW PRO version, see below. EVSW is a free software download from the Comark website, see Download and Installation Instructions below.

EVSW PRO

The EVSW PRO version is the Professional Version of the EVSW Software and is also available FOC from Comark. This version has been developed with leading Pharmaceutical Companies who are required to work within the confines of 21 CFR Part 11 and Good Manufacturing Practice.

Download and Installation Instructions

Download and installation instructions are provided on the website, however for convenience they are repeated here...

- Please first register for the Comark website by [Clicking Here](#)
- Login to the website and [Click Here](#) to visit the EVSW Download page
- Do not plug the cradle into the PC before the software and USB drivers are installed
- Locate the downloaded file on the PC and run the setup file to install the software and USB Drivers
- Once installed you can connect your cradle
- Double click on the Desktop Icon to Open the software
- More help can be found in the User Guide, see Home-User Guide

EVSW First Use

Click on the Desktop Icon to run the software.

Language Selection

Please select from one of the available languages....

(At time of writing this includes, English, English United States, Spanish, Finnish, French, Italian, Norwegian, Swedish)



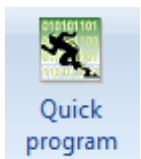
Click OK to confirm.

Logger Tasks

Each logger is programmed by means of a task. Once written, a task can be saved for use later (recommended) and or programmed directly to a waiting logger. Each task is unique to a model rather than a particular instrument and therefore any task for an N2012 can be programmed to any other N2012. Each task is checked for compatibility with the instrument before programming takes place. It is therefore possible to have several saved N2000 tasks for one model depending on the test you wish to run.

The Ev software supports a number of features for quicker programming and data retrieval from the data logger. 'Quick Program' allows the user to write and program a TASK with a click of a mouse button.

Quick Program



The easiest way to write a TASK for a data logger is to use the EV software feature Quick Program. Activate your logger by pressing the navigation button on the front. Place it in the Interface (Face down for N2000 and Face Up for EVt2). Run the software and select Quick Program. After a few seconds a data logging task for your data logger will be displayed. Each task has a number of predetermined settings.

These are as follows:

Description

The Diligence EV data logger can store a short summary of the logging run being performed. This text appears when the logged data is retrieved.

Channel Configuration

Each channel available in the particular Diligence EV data logger is presented on the Task form. If data is not required from a particular channel it can be disabled to allow more logging memory for other channels and save battery power.

Each logger has a particular number of channels available.

These are as follows:

EVt2 Channels

Temperature Internal sensor only

N2011 Channels

Temperature Internal sensor only

N2012 Channels

Temperature (1)	Internal sensor
Temperature (2)	CH2 on N2000BOX or Single external probe or Duplex external probe
Temperature (3)	CH3 on N2000BOX or Duplex external Probe
Temperature (4)	CH4 on N2000BOX
Temperature (5)	CH5 on N2000BOX

N2013 Channels

Humidity	Relative Humidity
Temperature	Air Temperature

N2014 Channels

Temperature (1)	CH1 on N2000ADP or Single thermocouple probe (Lumberg Connector)
Temperature (2)	CH2 on N2000ADP (Sub-Min Connector)
Temperature (3)	CH3 on N2000ADP (Sub-Min Connector)
Temperature (4)	Ambient temperature. (A probe or N2000ADP must be connected)

Note: For full accuracy, it is recommended that approximately 1 minute is allowed for stabilisation after connection of thermocouples, before logging is started.

N2015

Channel (1)	4-20mA Current Loop
-------------	---------------------

Channel Name (Only applicable to N2015)

A descriptive name can be included for the channel.

Sensor Type (N2014 Only)

This model can accept either Type-T & Type-K thermocouples. The setting can only be changed on the 1st enabled thermocouple channel; this is to prevent invalid setting such as Channel 2 as Type-T and Channel 3 as Type-K.

Units

The software will automatically offer a list of Units applicable to the sensor type chosen above. The setting can only be changed on the 1st enabled channel; this is to prevent invalid setting such as Channel 1 in °C and Channel 2 in °F.

Scale Mapping (Only applicable to N2015)

The scaling of the 4-20mA input can be chosen to display in a scale that you prefer, e.g. 4-20mA might represent 0-500mBar Pressure for instance. Use this section of the task form to set this up.

For example: Enter maximum current (Hi) e.g. 20mA and corresponding unit value as e.g. 500mBar.

Enter minimum current (Lo) e.g. 4mA and corresponding unit value as e.g. 0mBar.

Resolution (Only applicable to N2015)

The software allows the user to set the decimal point for the data. The software will then set the numerical value associated with that decimal point setting, e.g. setting 0 decimal points allows values of +/-32000 to be recorded, whereas setting 4 decimal points gives readings to +/-3.2000. Select the number of decimal points that best represents the data you wish to store.

Alarms

For each channel enter the desired alarm values within the min and max values displayed.

When alarms are enabled, an alarm condition is indicated by the red LED indicator flashing and the bleeper sounding, if activated (N2000 Only). The alarm will also be indicated by an Alarm Bell symbol and an H or L against the appropriate channel to indicate high or low alarm indication.

It is possible to specify an Alarm Delay time for each channel to prevent the operator being alerted to false alarms. In order for an alarm to cause an alert, the respective channel must have been continuously in alarm for the duration of the Alarm Delay time.

NB. Channels are only checked at the logging interval, e.g. if the Logging Interval is 1 hour and the Alarm Delay is 2 seconds any alarm condition will only be alerted after 1 hour.

The Diligence EV data logger can be set to latch an alarm indication so that even if alarm conditions return to normal, the indication continues. If “Auto-reset Alarms” is ticked then alarm indication ceases upon channels returning to normal.

Log Interval

Enter the interval at which data is to be logged. Use the longest interval that will show up any abnormal conditions within an appropriate time for your application. Logging intervals can affect battery life – see Specifications in the User Guide.

Logging Mode

Diligence EV data loggers have a choice of up to 4 logging modes. Each starts and stops by different methods. Certain modes are “multi-session” in that they can be stopped and started more than once. Data from each logging period is segregated making easy identification of separate “logging runs”.

Manual Start / Manual Stop

A “multi-session” mode where logging is started and stopped by pressing the button on the front of the data logger.

Note: EVt2 is always single session and when logging is over it must be downloaded before logging can begin again.

Manual Start / Dated Stop

A “single-session” mode. Select “Specific Date/Time” and un-tick the Start time. The data logger starts logging when the button on the front is pressed and stops when the Stop time is reached.

Dated Start/ Dated Stop

A “single-session” mode. Select “Specific Date/Time” and tick the Start time. The data logger starts logging when Start time is passed and stops when the Stop time is reached. A Start time that is already passed will cause the data logger to start logging immediately it is programmed.

Daily Logging (Not EVt2)

A “multi-session” mode. Select “Daily” and tick one or more week days. Each “day” of daily logging is represented by a separate logging period. The data logger starts logging when the next programmed Start time is passed on selected days only and stops when the Stop time is reached. By setting the Stop time before the Start time logging through midnight occurs.

Miscellaneous

Alarms

Alarms must be enabled in the Task, to log alarm data or if visual or audible warnings are required. If “Enable Alarms” is ticked, data is logged as low, normal or high according to the alarm values entered for each channel. Alarm delay or Auto-reset Alarms has no effect on the way data is logged.

Note: Auto-Reset and Enable Beeper are not available on EVt2

Wraparound (Not EVt2 and Not EVSW/PRO)

When the data logger memory becomes full, selecting Wraparound will cause older data to be overwritten as newer data is logged. When retrieving data during active logging with Wraparound, the data logger will temporarily suspend logging during data retrieval then automatically restart it after the retrieval is complete. This results in a new logging period being created. In this manner any spurious readings, e.g. those caused by the data logger being removed from the monitoring site for data retrieval, can be detected.

Evolution Clock

Use this section to set the Evolution Date and Time. Normally this is done by ticking Set Evolution Date/Time Synchronise with PC clock but if required a manual date and time can be set.

Data Logger Operation

Once you have written the task you must either save it for use later or use it to program the logger. To save click on the OK button and enter a file name. To program the logger select Program. The logger is now ready for use.

EVt2 Logger Operation

EVt2 Logger has three basic LCD modes.

Before Logging has started

The Display will default to showing the Time. A single button press will toggle the display to show the High Alarm value (if programmed) and a second button press will toggle the display to show the Low Alarm value (if programmed). A third button press will toggle the display back to the Time.

Logging start will be determined by the Task, either Manual or Automatic.

During Logging

The display will show the current temperature. A single button press will toggle the display to show the current MAX reading, a second button press will toggle the display to show the current MIN reading, a 3rd button press will toggle the display to show the current AVG reading and a 4th button press will show the current time and a 5th button press will return the display to showing the current reading.

After Logging has completed

A single button press will instigate an automatic rotation of the display through the following; MAX reading, MIN reading, AVG reading, Time in High Alarm, Time in Low Alarm and then the current Time.

These features are only available to the EVt2 Logger.

N2000 Logger Operation

It is possible to view the last logged reading and the alarm status of each individual channel. With each single press of the navigation button on the front of the data logger a single bleep is emitted and the data logger display will cycle from the clock display through all enabled channels. The Bell symbol appears when any of the enabled channels has logged an alarm. The Ringing Bell symbol appears whenever any of the enabled channels is currently in alarm. It is possible to determine which channel is in alarm by cycling through the channel readings and noting when “H” representing a high alarm or “L” representing a low alarm is displayed. An alarm indication can be acknowledged and cleared down by pressing and holding the navigation button on the front of the data logger for 3 seconds. A single bleep is emitted on the initial press followed by another single bleep after the 3 seconds has elapsed. Any further NEW alarm conditions will still be indicated.

Connecting to your logger

External Thermistor Probes and N2000BOX

Model N2012 is compatible with the Comark range of thermistor probes using the Lumberg connector. Where only 1 or 2 external channels is required, the probe is simply screwed onto the Lumberg socket at the base of the data logger. Note: For two channel operation without the use of the N2000BOX, the probe specified must be Duplex, e.g. RFAX100D, 1m Duplex Damped Air Probe. Where 3 or more external probes are required an expansion unit (N2000BOX) must be purchased. Up to 4 external probes can be connected when the expansion unit is used. Comark recommends that the N2000BOX is mounted with the cable exiting downwards to minimise any chance of moisture ingress. Only single channel probes can be connected to the N2000BOX.

External Thermocouple Probes and N2000ADP/T or N2000ADP/K

Model N2014 is compatible with the Comark range of thermocouple probes. Where only 1 external channel is required, the probe is simply screwed onto the Lumberg socket at the base of the data logger. Where 2 or more external probes are required an expansion unit (N2000ADP/T for Type-T thermocouples or N2000ADP/K for Type-K thermocouples) must be purchased. Up to 3 external probes can be connected when the expansion unit is used. These probes must all be of the same type, (either all Type-T or all Type-K). Comark recommends that the N2000ADP is mounted with the cable exiting downwards to minimise any chance of moisture ingress.

Note: Single probes must be of the Lumberg Type, else you will need an N2000ADP in either Type T or K. Multiple probe connections are always with the N2000ADP adaptor and probe must have a Sub-Min Connector

Wiring N2015

The Diligence EV N2015 allows monitoring and logging of the loop current in a 4-20mA system. The unit does not provide loop power and is intended for wiring into an existing transmitter circuit. The N2015 socket accepts a Lumberg SV60 locking plug. A pre-wired plug with wire tails is supplied to facilitate wiring into the current loop. The red wire is positive, white is negative.

For more information and wiring diagram please refer to the User Guide included in the software.

Logging Modes

Depending on the task that you have written, the logger will be ready to do one of three functions:

Manual Start/Stop Logging (N2000 Logger)

To prevent accidental starting or stopping, the navigation button on the front of the data logger must be pressed and held for 6 seconds. A single bleep is emitted on the initial press followed by a double bleep after 3 seconds then a multiple bleep after the 6 seconds has elapsed.

Note: If there is a current alarm indication then after the 3-second button hold the alarm indication will be acknowledged. The sequence must be repeated to Start or Stop manual logging. The logger can be started and stopped during manual logging as many times as you wish.

Manual Start/Stop Logging (Evt2 Logger)

To prevent accidental starting or stopping, the navigation button on the front of the EVt2 must be pressed and held for 6 seconds. The LOG indicator in the Display will activate to indicate that Manual Logging is now active.

To stop Logging simply press and hold the navigation button for a further 6 seconds and wait for the END enunciator to activate.

If the Logger has reached its limit of 3000 readings it will automatically stop and the display will show END. The EVt2 must now be downloaded and re-programmed to be used again.

Automatic Readings with Manual or Automatic Start and Auto End

The logger can be programmed to start at a pre-determined time and then to finish at a fixed time. In this case no further action is required by the operator and the logger will run automatically.

However if the box for Auto Start was not ticked then the logger requires a manual start. The logger is started via the navigation button as per Manual Start/Stop Logging, see above.

Daily Logging (N2000 Loggers Only)

The data logger will automatically start and stop at the pre-set times on the days you have selected. In this case no further action is required by the operator and the logger will run automatically.

Note: When a device is programmed to Auto-start during the active time window selected, the Auto Start will not begin until the subsequent session time begins. Example: A Diligence N2000 Series device programmed on Wednesday at 10am, scheduled to record "Daily, 8am to 5pm" will not begin logging until 8am on Thursday.

Taking Interim Readings (N2000 Only)

The display and alarm indication refer to the last measurement; at long intervals this reading could be very old. To update the display between the normal measurement interval, press and hold the navigation button on the front of the data logger for 3 seconds. A single bleep is emitted on the initial press followed by a double bleep after 3 seconds has elapsed. N.B. If there is a current alarm indication then after the 3-second button hold the alarm indication will be acknowledged. In this case the sequence must be repeated to update the reading. The reading taken is NOT stored.

Data Retrieval

Once the logging task has been completed you will need to retrieve the logged data back to the PC. Press the navigation button on the front of the data logger. Place the logger face down in the interface and under normal software operation the logger will be automatically detected and the data downloaded. If this does not happen automatically then click the 'Dock (Auto) Button'. The software will ask you if you want to download the data. Once downloaded the data can be viewed, printed and graphed.

Accessories

The following accessories are available for the Diligence EV range of Data Loggers:

- N2000BOX Multi-link box expansion unit with one Lumberg connector and 4 Lumberg input sockets, to connect up to 4 single Comark probes to N2012 data loggers.
- N2000ADP Multi-link box available in Type-T and Type-K forms (Part numbers N2000ADP/T & N2000ADP/K respectively) with one Lumberg connector and 3 Thermocouple sub-min input sockets, to connect up to 3 Comark probes to N2004 or N2014 data loggers.
- ADP50 Pre-wired adaptor for N2015 Current Loop Logger
- N2000CRU USB Interface for programming and downloading Diligence EV Data Loggers
- EVTCRU USB interface for programming and downloading the EVt2 Data Logger
- A17476 Replacement lithium battery and new case seal (For N2000 Only)

Probes

Comark has a full range of probes for N2000 Series DataLoggers.

Please [click here](#) to visit the Comark Website and view the probes available.

Maintenance

Care of Diligence EV Loggers

Although Diligence EV data loggers are specified as IP67, under no circumstances must Diligence EV data loggers be cleaned in a dishwasher. A wipe with a damp cloth should be adequate to remove light to medium soiling. The use of a mild detergent only, is recommended for removing grease.

Caution: Do NOT use solvents as they can attack the plastic case.

Battery Replacement (N2000)

The battery is retained on the circuit board by two battery clips. To replace the battery, undo the four case retaining screws. Carefully separate the two halves of the case, by hand. The battery can then be removed. Replace with Part no. A17476 which comprises a new full size AA Lithium cell and a new case seal.

N.B. Observe the correct polarity; see Fig 1 below.

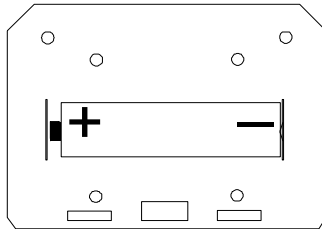


FIG 1. CORRECT POLARITY

Replacement of the case is the reversal of opening. N.B. Ensure that the new seal is located neatly in the guide. Ensure that any connector pins are correctly aligned. Avoid over tightening the screws.

Battery replacement in the EVt2 is not possible, please speak to Comark or your Local Distributor, if your EVt2 requires battery replacement.

Comark Instruments

52 Hurricane Way,

Norwich, Norfolk NR6 6JB England

Tel: 0207 (+44 207) 942 0712

Email: sales@comarkinstruments.com

Comark Instruments

PO Box 500,

Beaverton, OR 97077, USA

Tel: (503) 643 5204

Email: sales@comarkUSA.com

© Comark Instruments