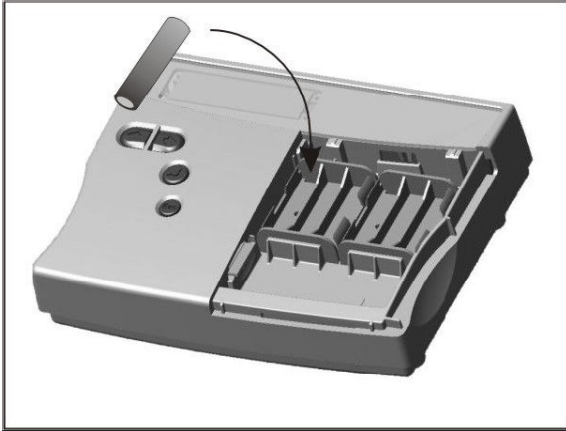


USERGUIDE-V1 FOR SQ2040 DATALOGGER FROM GRANT- UK

Installing the batteries in Data Logger:

The 2020/2040 uses six AA size alkaline batteries located under the removable



cover shown below. To insert new or change the existing batteries:

1. Open the battery cover by pushing down and sliding as shown.
2. Insert six AA* batteries, ensuring the correct polarity.
3. Refit the battery cover

* It is recommended that all replacement batteries are of the same manufacturer, type and condition.

Power indicator

Battery indicator

When logging please ensure that the batteries in the unit have sufficient capacity to complete the logging task. This can be checked via the battery indicator located in the top right of the display.



HIGH
CAPACITY



LOW
CAPACITY

External power indicator



The logger may be powered from an external source (8-28V DC or USB)

Control Panel Menu:

Log Control

In this menu you can Arm (Logging On)
Or Disarm (Logging Off) the logger.



Meter

Here you can view readings of each
channel in Real Time.

Use the enter key to auto
scroll through the channels.



Status

The Status menu gives you access to
information relating to the logger such as
memory and power supply voltage. You
can also override the alarm outputs in
here.



Setup

This contains menus for setting up
Time & Date and the
opportunity to load the required Setup
out of 6 pre-stored setups



Data Files

This menu allows you to copy data files
To an external memory card (if fitted) and
delete the unwanted data files held within
the loggers memory.

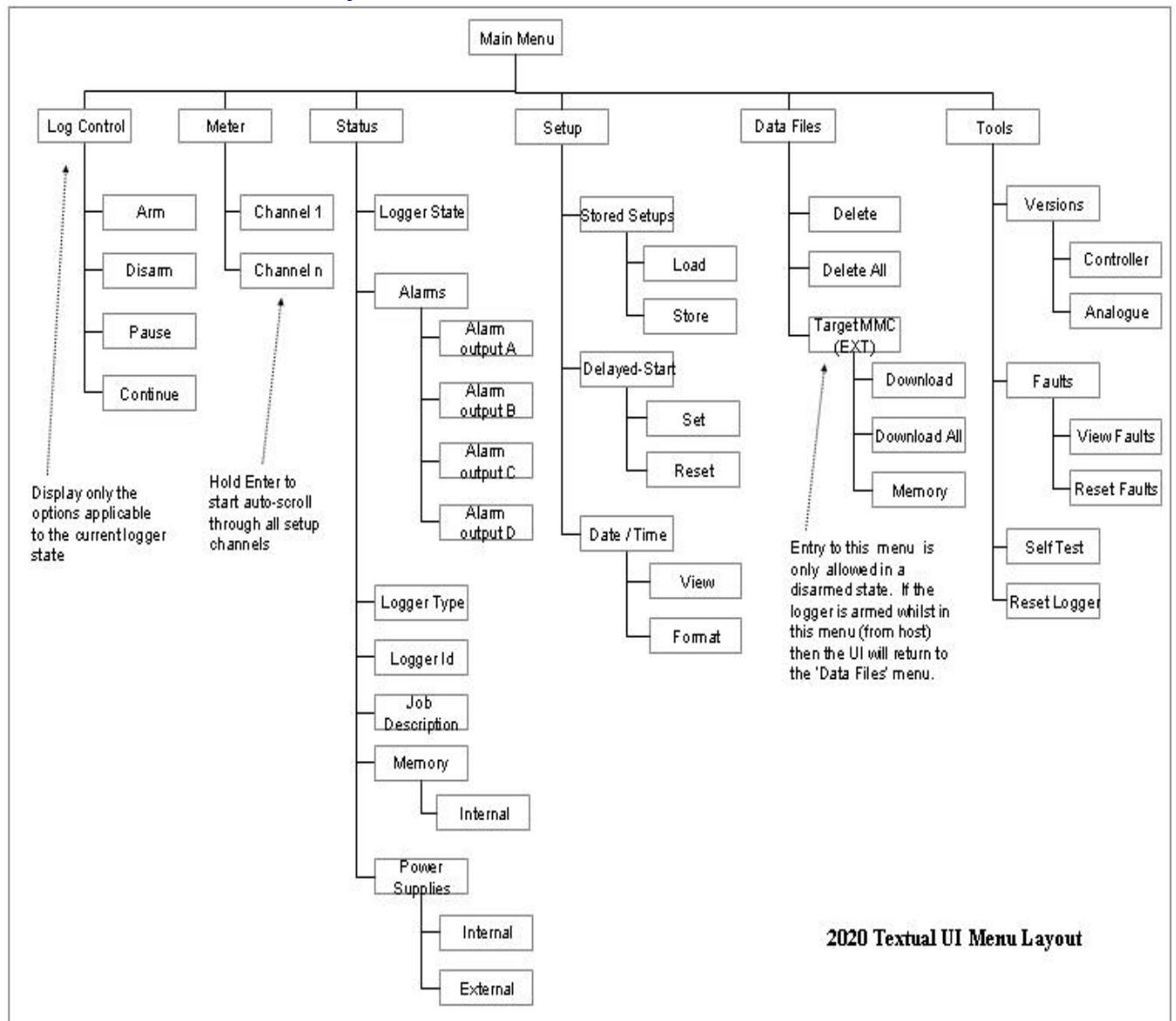


Tools

The Tools menu contains maintenance
type functions such as querying the
software version of the logger,
performing a self test and resetting the logger.

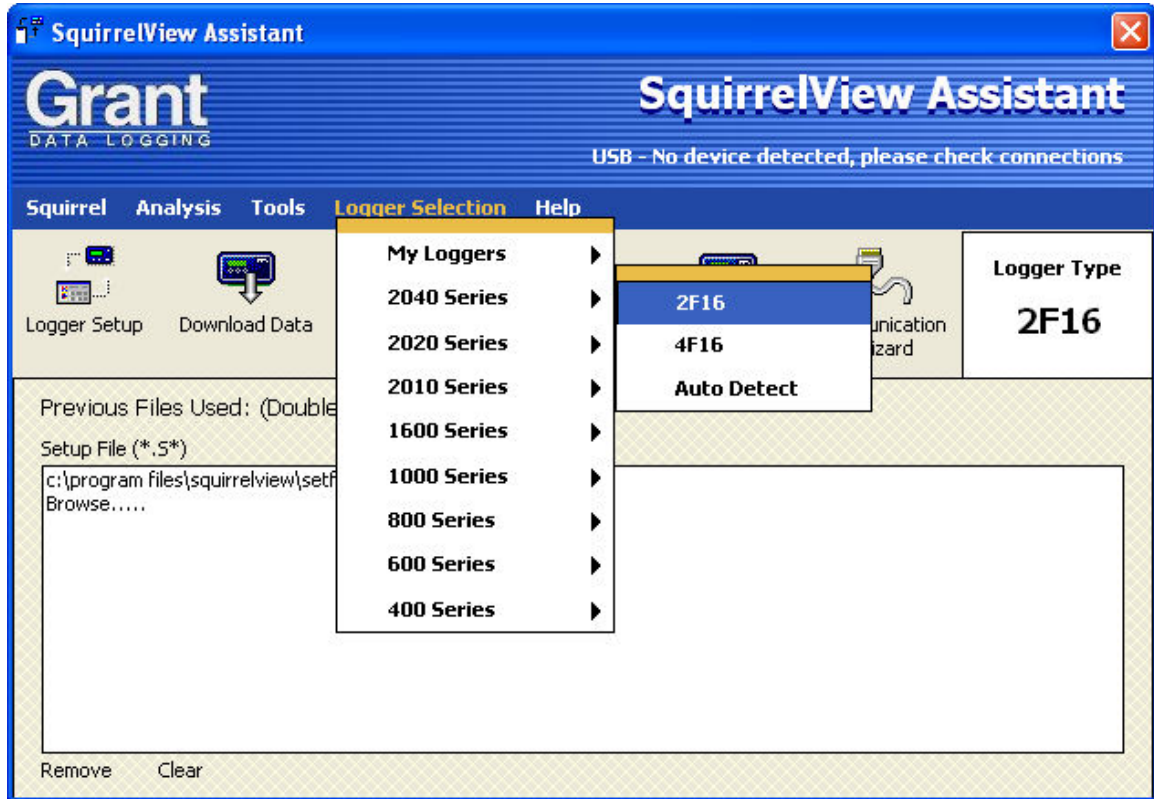


2040 Front Panel Summary Ladder:

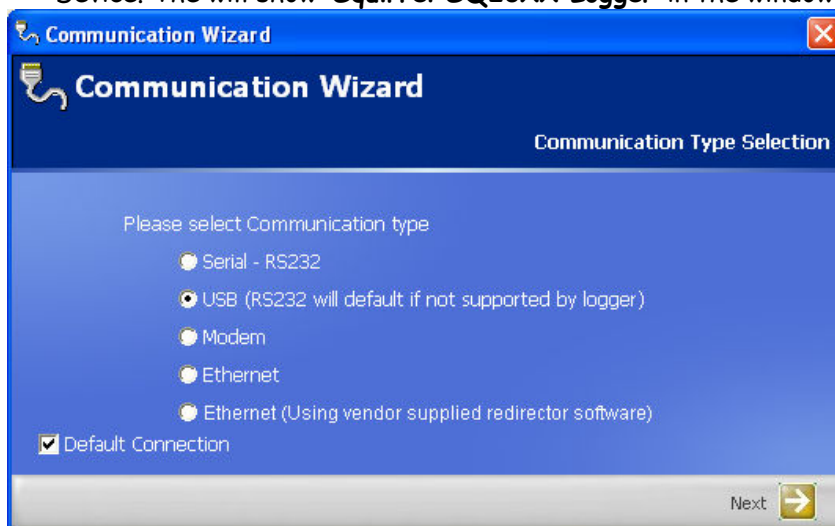


Communication of Data Logger with PC:

- Power up the logger SQ2040 & connect it to PC through USB Cable.
- Open Squirrel View plus software
- To select the Logger model go to Logger Selection → 2040 Series → 2F16



- Then go to Communication Wizard & select USB, click next & click on Detect USB Device. The will show **Squirrel SQ20XX Logger** in the window. Then click on finish.



This will enable the logger to Communicate with PC.

Setup Logger:

- A) Creating New set up
- B) Loading Pre-stored set-up

Creating New Set-up :

To create new set-up of logger as per your requirement.

- i) First communicate the logger with PC. Refer the procedure of communication.
- ii) Click on **Logger Set up** I-con from main window, this will open Logger Setup window.

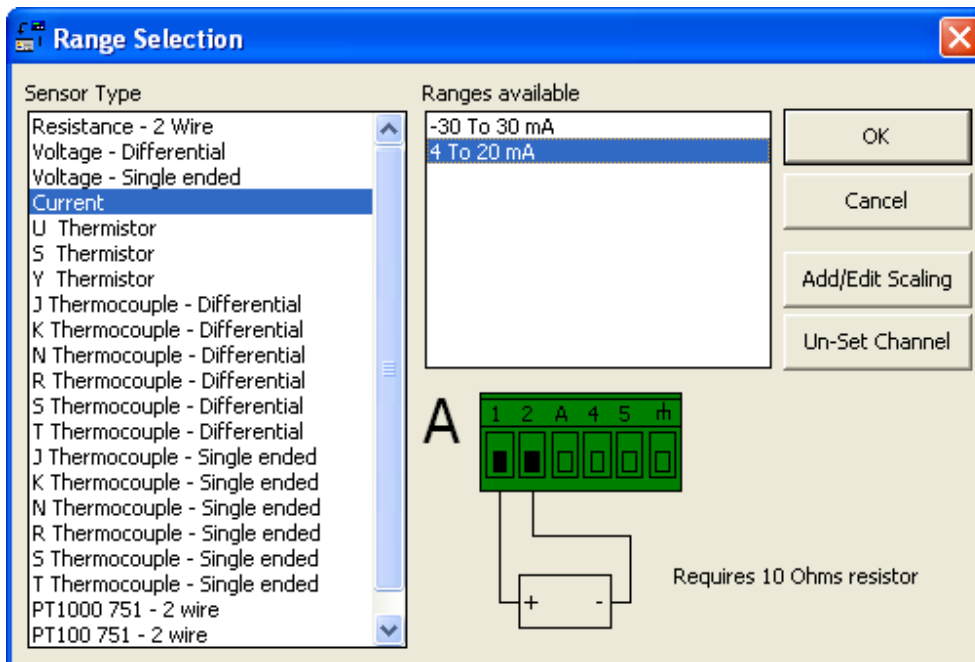
How to set Pressure Channel? :

- 6 Pressure channels can be set in first three blocks **AB & C** because these three blocks are already connected to Pressure Terminal on the interface unit named P1 to P6.

- To set up new pressure channel

Double click on first row of **Sensor Type** column in Block 'A', **Range Selection** window will open. Then Select the **sensor type: Current** & Ranges Available

4-20 mA. Connection of the signal of pressure transmitter will be displayed as follows. (Note : This connection is already connected to logger to Pressure Terminal P1 on Interface unit.



Scaling:

Click on **Add / Edit scaling**, this will open **Scaling Range** Window.

	Base Range	New Range
Range Maximum	20 mA	350.00 PSI
Range Minimum	4 mA	0.00 PSI

In this window scale the Pressure Transmitter range as

For e.g. for Pressure Transmitter Range: 0-350 psi scaling will be as follows,

Display 20 as 350
Display 4 as 0
Unit of mA as PSI
Decimal places 2

Then click OK

Then in **Channel Description**, give the name of that channel (Identification of Sensor Location: where you are connecting the sensor. e. g. FUEL.)

This will enable your Pressure channel of 0-350psi which has to be connect to Pressure Terminal P1 on interface unit.

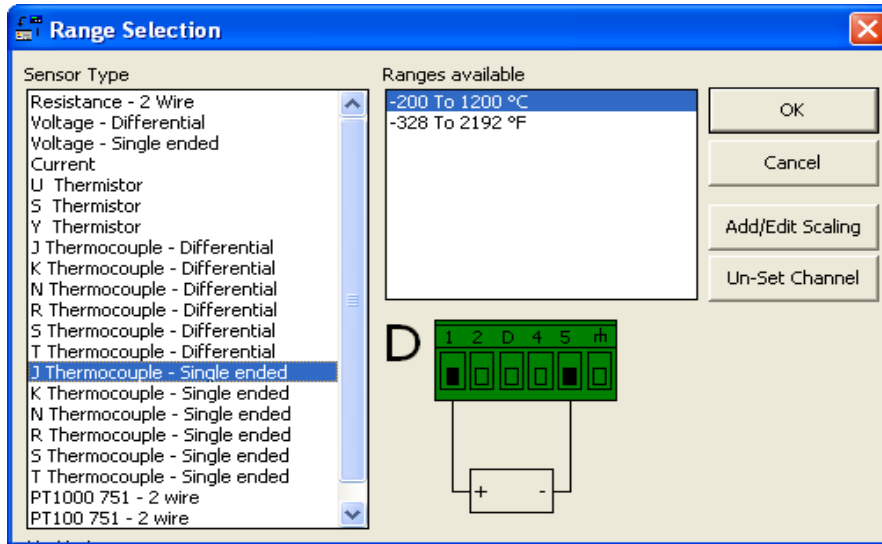
The same pressure is for setting of remaining 5-pressure transmitter as per their range.

Setting of Thermocouple channel:

- 12 Temperature channels can be set in three blocks named **D**, **G** & **H** because these three blocks are already connected to Temperature Terminal on the interface unit named TJ1 to TJ8 for J Type (Black Connectors) and TK9 to TK12 for K Type (Yellow Connectors)
- We can connect **8** J Type Thermocouples to block No. **D** & **G** and **4** K Type thermocouples to block No. **H**.
- **To set up new J type Thermocouple channel**
Double click on **Sensor Type** column in Block '**D**', **Range Selection** window will open. Then Select the **Sensor type: J Thermocouple - Single Ended** & Ranges Available : - **200 To 1200 'C**.

Then in **Channel Description**, give the name of that channel (Identification of Sensor location : where you are connecting the Thermocouple sensor .e.g. Intek Manifold.)

Connection diagram of J type thermocouple displayed as follows.
 (Note : This connection is already connected to logger through thermocouple connector **TJ1** on Interface unit where you can connect thermocouple sensor directly through black thermocouple connector.)

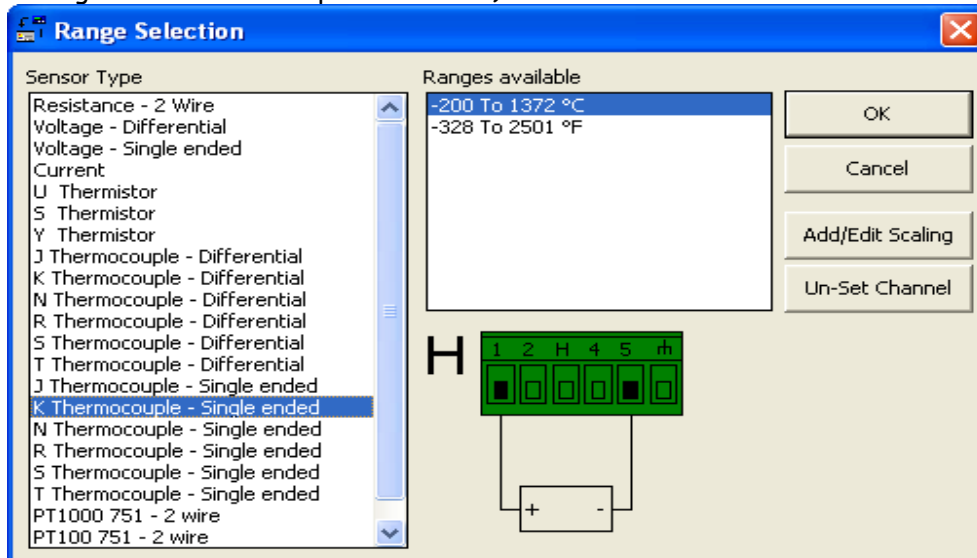


Like this 4 temperature channel in D block & 4 channels in G block can be set.

To set up new K type Thermocouple channel:

- Double click on **Sensor Type** column in Block 'H', **Range Selection** window will open.
 Then Select the **Sensor type: K Thermocouple - Single Ended** & Ranges Available :
-200 To 1372 °C.

Connection diagram of K type thermocouple displayed as follows.
 (Note : This connection is already connected to logger through thermocouple connector **TK1** on Interface unit where you can connect thermocouple sensor directly through black thermocouple connector.)



As above we can connect 4 K type thermocouple channels in block number H.

Setting of RPM channel:

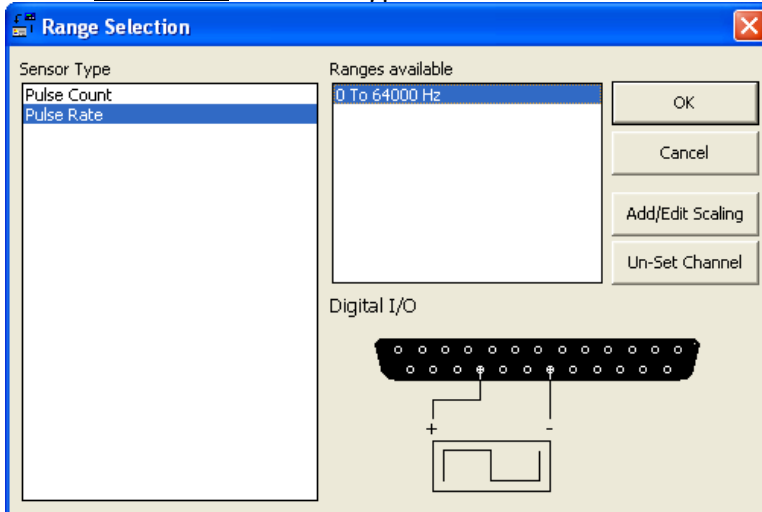
Internal connection of RPM channel is already connected to data logger through BNC connector, which is provided on interface unit named RPM. We have to connect MPU's signal to this connector.

RPM channel is to be set through **Pulse channel 3** (Digital I/O channel)

- To create Pulse frequency channel

Double click on Sensor type in **Pulse Channel 3**.

Select **Pulse Rate** in sensor type.



Then click add / Edit scaling, in this window we have to scale Frequency into RPM.

For e.g. For engine having Number of teeth **142**

Formula:

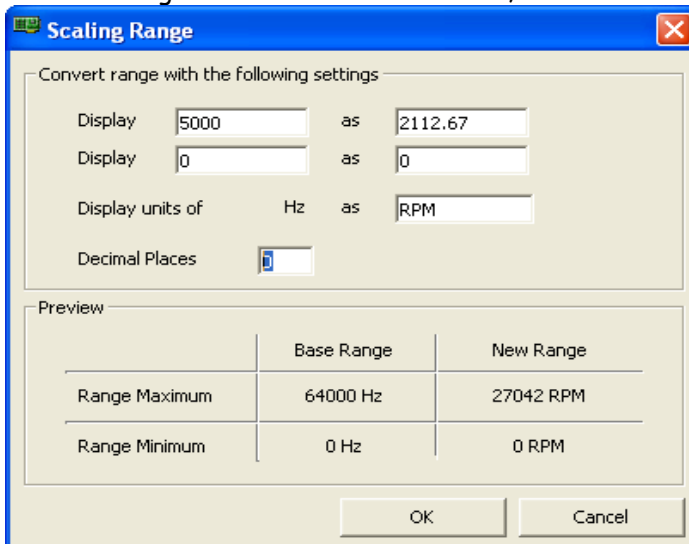
$$\text{RPM} = \text{Frequency} \times 60 / \text{No. of teeth}$$

For Frequency = 5000 & no. of teeth = 142

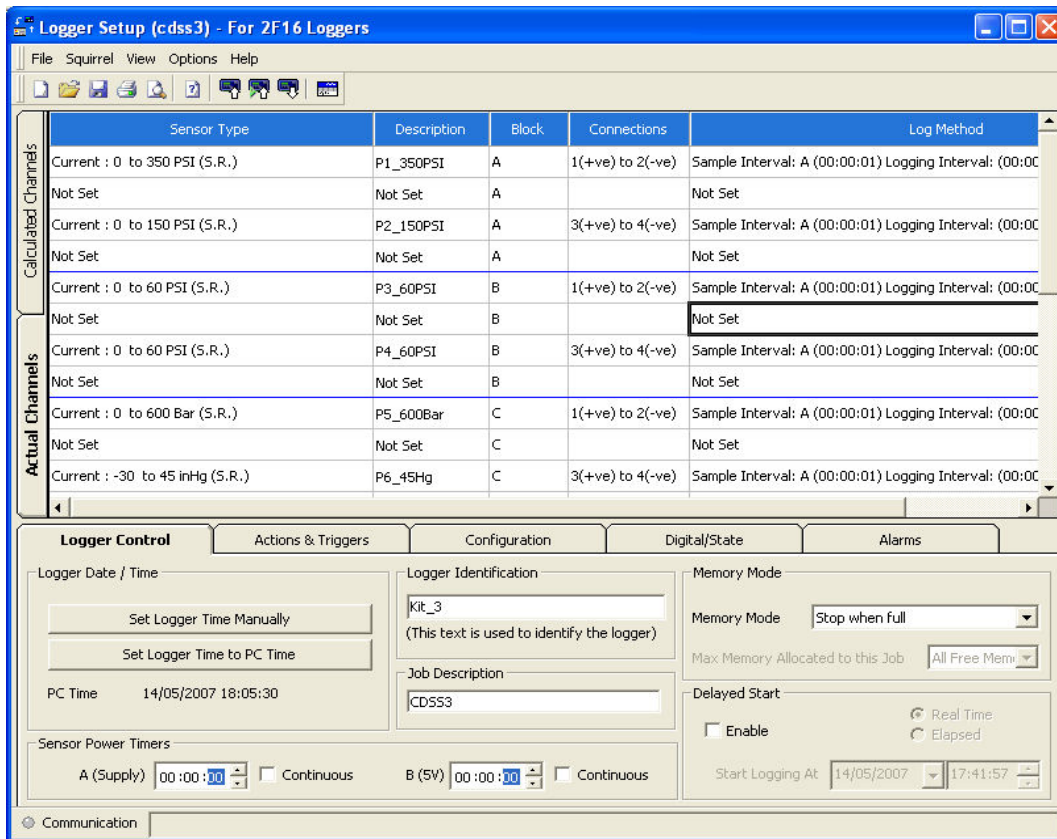
$$\text{RPM} = 5000 \times 60 / 142$$

$$\text{RPM} = 2112.67.$$

The in scaling window we have scale it as,



Display	5000	as	2112.67
Display	0	as	0
Unit of	Hz	as	RPM



Creating & Saving the Setup file.

After creating the setup, save it from file menu. This set-up file will be saved to

C:\Program Files\SquirrelView\SetFiles

These Set-up file can also be used for creating new set up or changing existing set-up.

However some standard Set-up files will be provided. You may further edit those files and save as different file name & use it.

Sending Set-up file.:

After saving the set up file we have to transfer it to Data Logger. Before that ensure the communication of Logger with PC.

Select **Squirrel** drop down menu and select **Send Set-up to squirrel**. (squirrel means logger).

This will save the set-up in Data Logger's memory. Now the logger will start functioning as per the channel set-up.

Storing Set-up to logger:

You can store 6 set ups can be preloaded & stored in Data logger giving different names.

This will enable us to **retrieve & use the required setup on field** simply by selecting the setup by using the key of data logger.

Now we will see how to preload these setups.

Procedure

Go to **Squirrel menu → Stored Setup:**



Recently sent setup will be the active setup. You can store this setup in required store location (1 to 6) by simply Drag & Drop.

Like this we can preload & store six set-ups at in six store locations in logger.

This will enable us to **retrieve & use the required setup on field** simply by selecting the setup by using the key of data logger.

To Load / Retrieve the required set-up :

To load set-up from logger keys, Go to **Main Menu → Set-up → Stored Set-up → Load →** then select the required setup by arrow key → press enter key & hold for 5 seconds.

Now this required set up is loaded & logger with start functioning as per the selected set up.

Data Logging:

Before going to starting the Data Logging, please check the following things,

- **Battery Level** of data logger. To check the Battery status from SquirrelView software connect logger to PC & Click on **Logger control** Icon, now it will show battery level. If it is less **then 50% then replace** the batteries & keep extra batteries with you.
- **Memory level** of data logger. : To check the memory status from SquirrelView software connect logger to PC & Click on **Logger control** Icon, this will display memory in use & Free memory in KB. Total memory of data logger is 16 Mbytes means we can store 18 lakhs readings.
- To **delete the data files** from internal memory of data logger. In **logger control** window go to **Squirrel → Delete Data Files → Select data files → Delete Selected files.**
- **Connections** : Check the connection of Sensor & Battery to the connectors provided on logger case. Confirm the polarities of battery. Do not connect Vehicle battery.
- **Confirm that**, all the sensors are connected to the right channel as per the ranges & type defined in the Set-up.

For e.g. If you have set Pressure channel No. P1 for range of 0-350 psi for Fuel pressure then confirm that 0-350 psi pressure is connected to P1. Do not connect 0-150 Pressure sensor to that channel, otherwise it will show wrong readings.

Metering of channels: We can see metering on Data logger & on computer also. To See the metering on Data Logger Form **Main Menu** Press Enter → **Meter** Press Enter → press arrow key to scroll the channels one by one. To come out from metering press **ESC** key.

Metering on computer : Connect logger to PC. In squirrelview main window click on **Metering** , this will show metering in form Graph, bar or needle you may select any one of these. Confirm that all channels are showing correct data to start data logging.

- **Start Data Logging:** To start Data Logging Go to **Main Menu** press Enter → **Log Control** press Enter → **Arm** → Press & hold the Enter Key, this will show the message **Hold to continue**, then **Selection Set** message will display, then remove the finger. This will start the logging.
- **Stop Data Logging:** After completion of Trial Stop data Logging. From Main Menu go to **Log Control** press Enter → **Disarm** → Press & hold the Enter Key, this will show the message **Hold to continue**, then **Selection Set** message will display, then remove the finger. This will stop the logging.
- **Downloading Data File:** After completion of Data Logging communicate logger with PC as per the procedure. From Squirrelview software main menu click on **Download Data** → Select Data Files → Action after downloading → Graph Data → Download Selected Files. This will open the data file in **Analysis window**.

You may find more information about its use and software in the User Manual provided in each kit and the help provided in the software

Important Instructions

- It is recommended that one person from zonal office will be responsible for the use and its contains of kit while it is being used, transported or stored.
- Kit will be used by the Persons Trained by the supplier.
- Proper packaging should be done while it is being transported.
- Before and after the data acquisition trial the logger, sensors, cables & other parts in the kit should be checked as per the checklist provided with the kit.
- In each month report related to its use, important data files, contents, missing parts etc. should be sent to H. O.
- In case of any problem about the use of equipment or any will be communicated to HO immediately.
- Users will should not unnecessarily open its interface unit and it's wiring etc.
- Software master CDs should be maintained separately and can be loaded at multiple locations and all ROs.
- 12V, 7amp hr Sealed lead acid battery will be kept at ZO and each ROs to avoid its transportation from one place to other.
- **Direct Technical Support Helpline nos are:**
- **9423241542 / 9422031263 & 02024376819**