



Data Logger DL2200



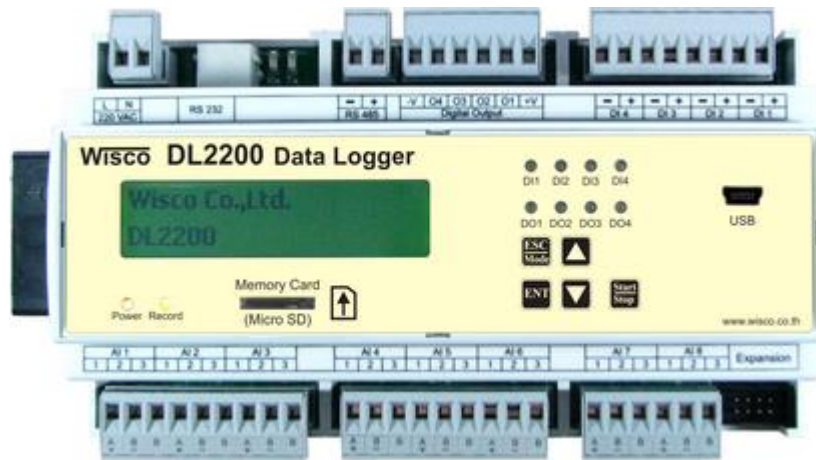
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Data Logger DL2200



AI	= Analog Input Channel (AI1-AI24)
DI	= Digital Input Channel (DI1-DI4)
DO	= Digital Output Channel (DO1-DO4)
CT	= Counter Channel (DI4)
DL2200 Utility	= Using for Datalogger setup
DL2200 Data Viewer	= Show Data File

1. Introduction to Datalogger DL2200

1.1 Feature

- ❖ 8 Analog Input (Irrelevant to each other)
- ❖ 4 Digital Input and 4 Digital Output
- ❖ Isolate AI relay, DI/DO Separated by Optoelectronic
- ❖ Stand alone Command and Setup with LCD Screen
- ❖ SD/MMC memory Card
- ❖ Stand Alone Recorded Data Logger
- ❖ Real Time Data Acquisition Via SCADA System

1.2 Specification Data

Serial Communication

Interface: RS-232, RS-485, USB (Isolated), Modem (Option)

Protocol: MODBUS (ASCII, RTU), Wisco ASCII

Support Software: Citect, Ifix, Wonderware, Lab View, Genesis, etc.

Serial Communication Parameter

Baud Rate: 4800, 9600, 14400, 19200, 38400, 57600, 115200

Data Bits: 7,8

Stop Bits: 1,2

Parity: None, Even, Odd

Input

Analog Input: 8 Channels (Relay isolated)

ADC Resolution: 16 Bits

Input type: Thermocouple (R, S, K, E, J, T, B), RTD (PT100, PT1000), 0-100mVDC, 0-10VDC, 0-5VDC, 0-20mA, 0-40mA (Programmable)

Digital Input: 4 Channels, 0-24VDC, Low = 0 – 5 V, High = 5 V Up (Opto isolated)

Impedance: 1 K Ω

Output

Digital Output: 4 Channels (NPN Open Collector) 50V, 500mA

Capacity

Memory SD card: 4 Gbytes

Recording Interval: 1 sec – 18 Hours (Programmable)

Data Format: Can be exported to MS Excel, MS Access, MS Word

Power Requirements

Power Supply: 85-230VAC (12VDC, 24VDC Optional)

Environmental Limits

Operating Temperature: -10 to 55 °C

Operating Humidity: 5 to 95% RH

Storage Temperature: -10 to 70 °C

Physical Characteristics

Dimension: W160 x H90 x D60 mm.

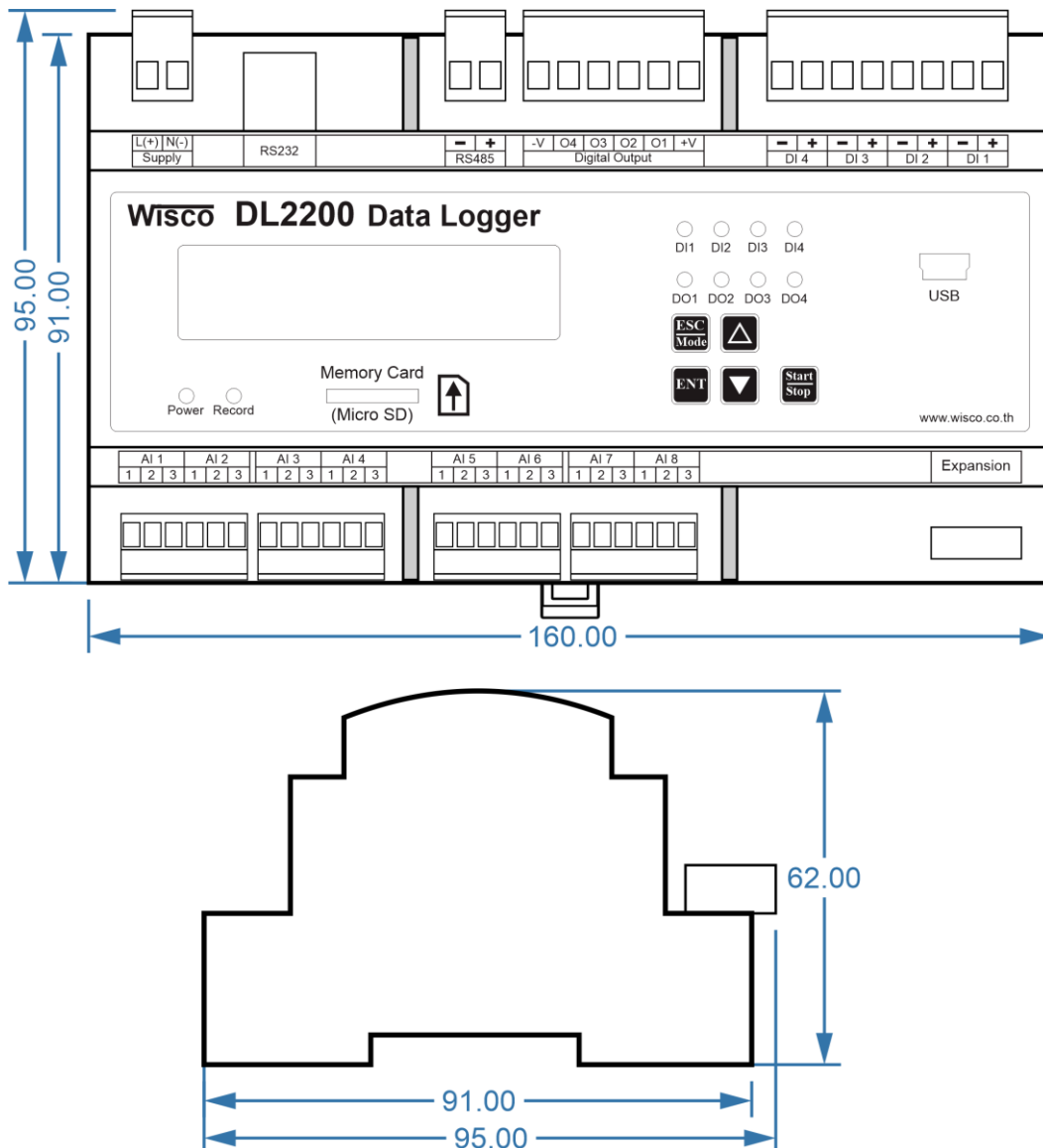
Mounting: DIN Rail

Warranty

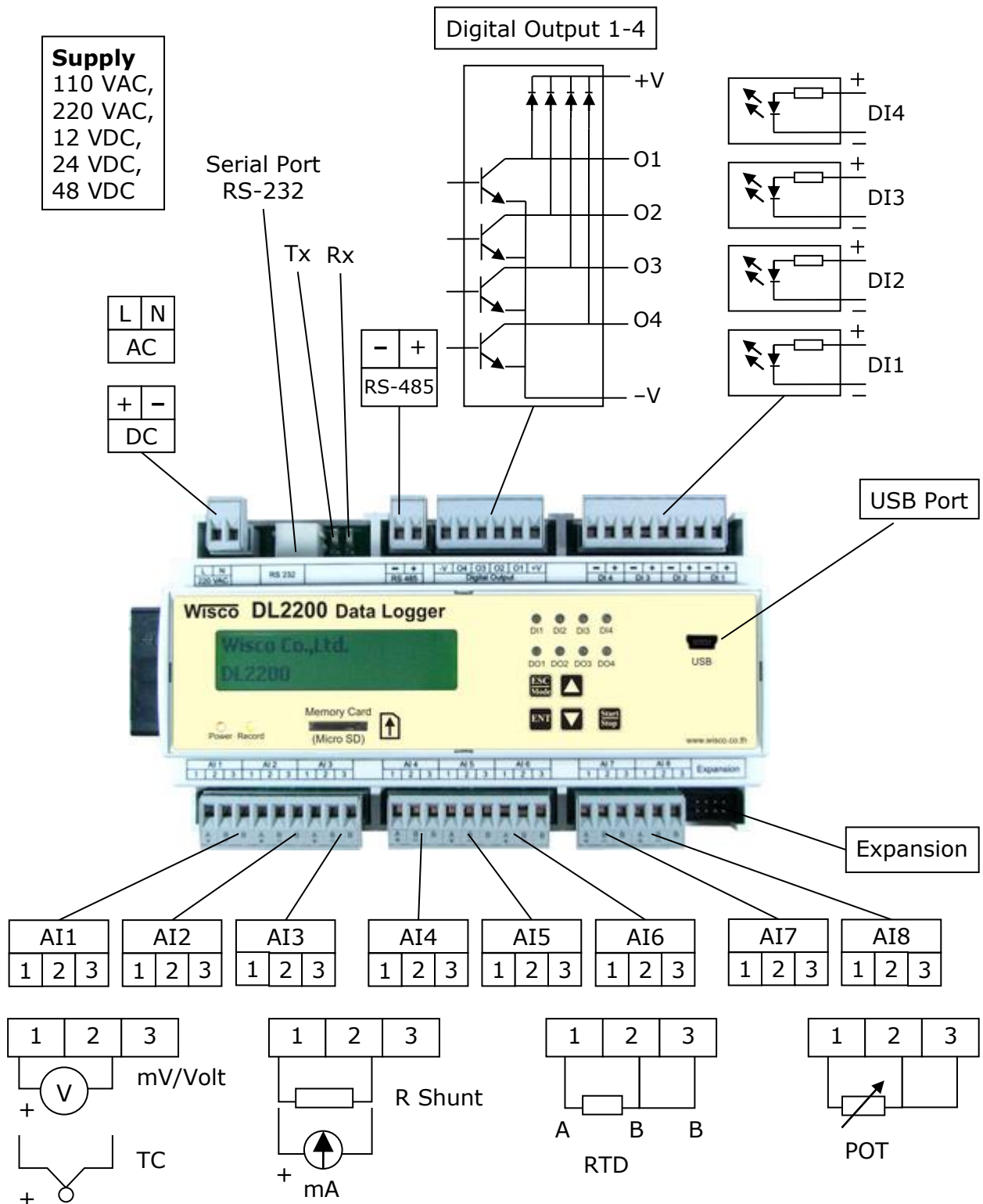
Warranty Period: 5 year

Details: www.wisco.co.th

1.3 External Dimensions



1.4 Wiring Diagram

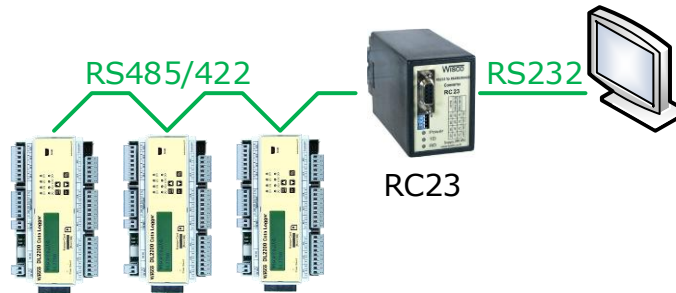


1.5 PC Interface



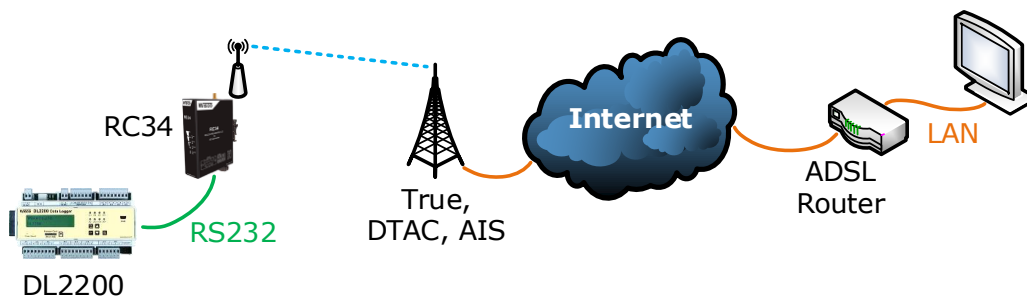
DL2200

Using RS-232 or USB Connection



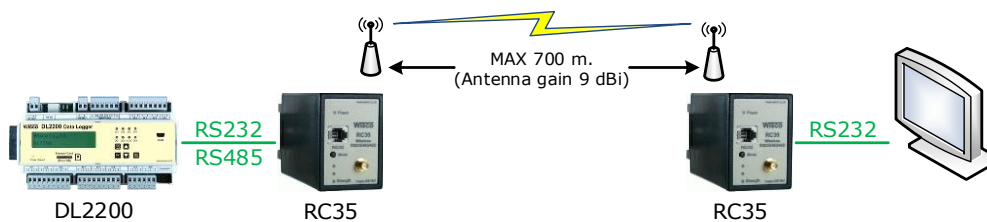
DL2200

Using RS-485/422 Connection



DL2200

Using Modem Connection



DL2200

RC35

RC35

Using Network Wireless Connection

1.6 System Configuration

System configuration regarding to the device as follow:

- ❖ **RTC(Real Time Clock)** device's clock, Time reference for the device which is able to set day, date and time by clicking on the panel button, Go to **System->Date&Time** (See topic **2.7**) or using **DL2200 Utility** Program which run on PC
- ❖ **Security** for protecting unwanted revised or any unnecessary changed. Password will be required before user can change any parameter. This Security function can disable or enable by go to **System Menu ->Security** and User can change password by click on **System Menu -> Change Passcode** (See topic **2.7**) or using **DL2200 Utility** Program which run on PC
- ❖ **Back Light** Light on the display monitor. In Case using batteries or saving power mode, Back light is be able to turn off or setting time to turn the back light off by go to System -> LCD Back Light (See topic **2.7**) or using **DL2200 Utility** Program which run on PC

1.7 Files Management

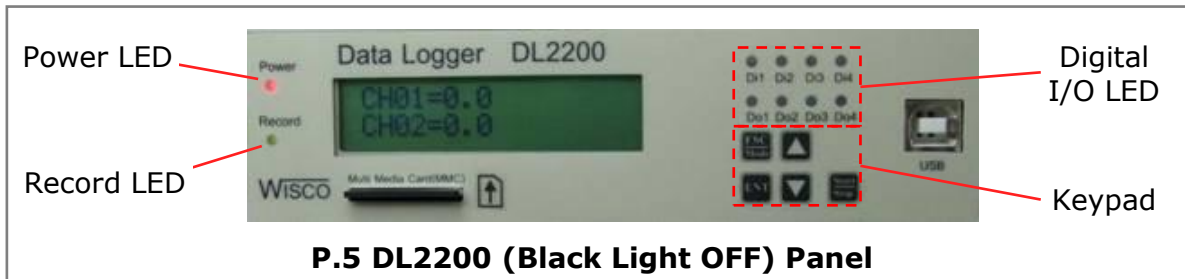
DL2200 is using SD/MMC Memory card for recording data which compatible to FAT16 and FAT32 files. All data will be store on SD/MMC Memory card as binary files (*.wda). File name will start with "W" follow by 5 digits number such as W00001.wda. File number will be record as counting number. Number will automatically run every time a new file is opened. File number can be clear or set up by go to File **Menu -> File No** (See topic **2.4**) or using **DL2200 Utility** Program which run on PC

1 Record is 1 set of data which are read and recorded at the same time. One file is able to store maximum 60000 data sets. User would be able to set the maximum set of data by using **File->Max Rec/Size** (See topic **2.4**) whenever set of data had been reach the maximum amount the system will automatically close the current file and open the new one.

Note: The maximum amount the can be store on the memory card is 65535 files

2. Basic Start up for Datalogger DL2200

In order to operate Datalogger, it can be done by DL2200 Utility Program or click on the device panel. The Datalogger will respond by using LCD display, LED light and small speaker



2.1 User Interface of DL2200

LED light for showing the device status, there are 3 kind of LED light:

- **Power LED** show power status
 - **Red** light = power status is normal
 - **No light** = No power
- **Record LED** show recording status
 - **No light** = there is no SD/MMC Memory Card
 - **Green** light = SD/MMC memory card has been installed
 - **Blinking Green** Light = system is recording data
 - **Orange** Light = warning that SD/MMC memory card is removing while recording data
 - **Blinking Red** light = error has been occur with SD/MMC memory card
- **Digital I/O LED** show status Digital Input and Digital Output signals
 - **Red** light = Logic 1 (ON)
 - **No light** = Logic 0 (OFF)

Keypad, there are 5 buttons on the front panel:



Each button has different function depending on the current operation mode. Detail of the "Hot key" are contained at appendix B.

LCD display monitor show English characters in 2 lines which use for display status and set up menu, there are 2 modes of LCD monitor:

❖ Monitor Mode

M

❖ Setup Mode

S

***** Mode can be switch by click on  button and hold for 3 second**

2.2 Monitor Mode

Monitor Mode will display data or status such as Analog Input Signal, Environment Temperature and date/time of the device etc. there are 5 sub-modes as follow:

- ❖ M.1 Date & Time
- ❖ M.2 Analog Input Signal
- ❖ M.3 Record Status
- ❖ M.4 Maximum capacity of memory card (MMC Status)
- ❖ M.5 Ambient Temperature
- ❖ M.6 show other message as user defined

Temporary change display mode (previous mode will be restore after reboot)



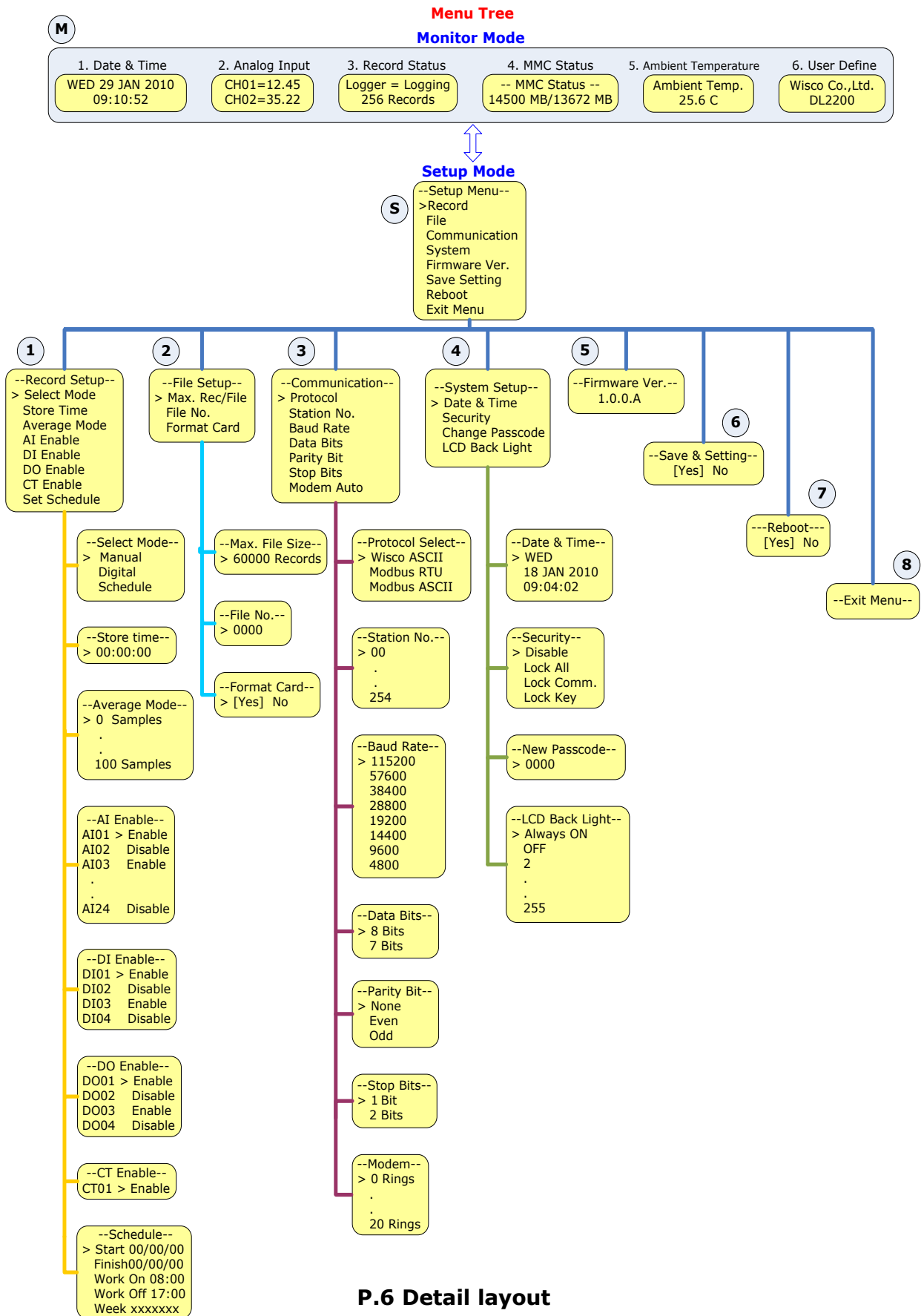
In M.2 mode, user allow to choose Analog Input channel which user want to show



For the first line



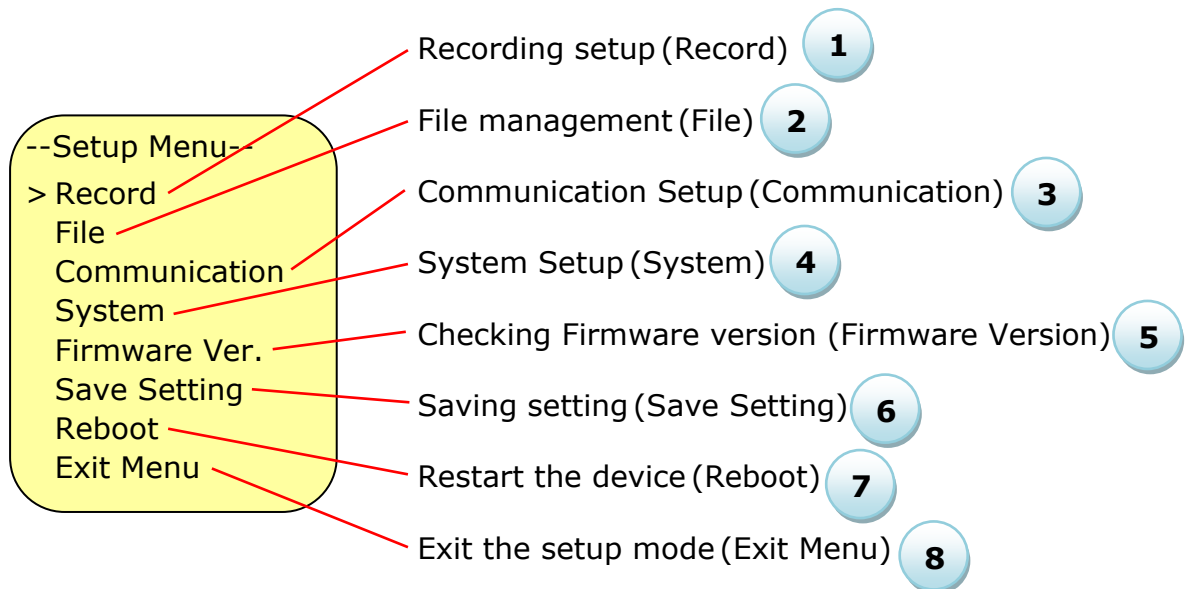
For the second line



2.3 Setup Mode

S

Setup mode uses for set up all parameter for all functions of Datalogger. There are 8 main setup modes:



There are 4 buttons for operating:



Go back to previous menu or cancel the setup



For selecting in the setup mode or confirm when user get desire value



Move up or increase number



Move down or decrease number

2.4 Setup Recording Data 1

Setup Recording Data mode used setup parameter and function, There are 8 main functions:

--Record Setup--

- > Select Mode
- Store Time
- Average Mode
- AI Enable
- DI Enable
- DO Enable
- CT Enable
- Set Schedule

❖ **Select Mode** there are 3 types of recording mode:

- ❖ *Manual* –Start or stop recording data by click at the command button on the panel or use program that run on PC
- ❖ *Schedule* –set up automatic recording data, set date and time for recording data for each day
- ❖ *Digital Trig* –control start and stop recording data by Digital Input signal (DI1)

❖ **Store Time** Set up the frequency of recording data, start from **1** second thru **18** hours which relate to amount of Analog Input channel (reading time for 1 channel = 100 ms) for example, reading 16 channel data would need at least 2 seconds and reading 24 channel data would need at least 3 seconds

❖ **Average Mode** calculate the average value before recording data, how many time for reading signal would be a unit for this value and record onto SD/MMC memory card

❖ **AI Enable** set up the recording channel for Analog Input

- *Enable* = record data of the channel onto file
- *Disable* = Do not record data of the channel onto file

❖ **DI Enable** select recording channel for Digital Input (Enable, Disable)

❖ **DO Enable** select recording channel for Digital Output (Enable, Disable)

❖ **CT Enable** set up recording type for Counter (Enable, Disable)

❖ **Set Schedule** set up day/month/year and time for recorded data

- *Start* -set up date/month/year for starting record data
- *Finish* -set up date/month/year for stopping record data
- *Work On* -set up the start time for recording data for each day 24hour/60min/60second
- *Work Off* –set up the stop time for recording data for each day
- *Week (Work Day)* -select the day to recording data in each week. SMTWTFS are abbreviation of day, start from Sunday thru Saturday

2.5 File Management 2

--File Setup--

> Max. File Size
File No.
Format Card

- **Max. Rec/File** Set up the maximum amount of data that can be recorded in 1 file. Once the maximum has been reached, file will be closed and open the new file automatically.

- **File No.** is number that will be used as file name. Numbers will automatically be run up every time the new file has been created.
- **Format Card** – Delete all the data in the memory card.

2.6 Communication Setup 3

--File Setup--

> Protocol
Station No.
Baud Rate
Data Bits
Parity Bit
Stop Bits
Modem Auto

- ❖ **Protocol** In order to create a connection with the RS-232 or the RS-485, there are 3 Protocols which are Wisco ASCII, Modbus ASCII and Modbus RTU
- ❖ **Station NO.** Number of each Datalogger
- ❖ **Baud rate** communication speed 115200, 57600, 38400, 28800, 19200, 14400, 9600, 4800 bps

- ❖ **Data Bits** –size of data for sending and receiving (8, 7)
- ❖ **Parity Bit** Bits that will check for error (None, Even, Odd)
- ❖ **Stop Bits** the amount of Stop Bits (1, 2)
- ❖ **Modem Auto** Automatic pickup call configuration
 - 0 = turn off the automatic pickup call
 - 1 or more = how many times the ring tone will ring before the call has been picked up

2.7 System Setup 4

--System Setup--

- > Date & Time
- Security
- Change Passcode
- LCD Black Light

❖ **Date & Time** Set up the reference time for the device by selecting day, date, month and year.

❖ **Security** Turn on-off the security system, the passwords will be required in order to connect to program or set up on device panel

❖ **Change Passcode** –change passwords which require as a number 0-9 at last 4 digits (Default Passcode 0000)

❖ **LCD Back Light** -control the brightness of display monitor

- *OFF* = turn off the LCD back light
- *Always ON* = always turn on the LCD back light
- *AUTO* = automatically turn off the LCD backlight as the user set up, time begin counting since the last time that user click on Datalogger buttons (2 - 255 second)

2.8 How to Check Data Logger Firmware Version 5

Datalogger will show the current firmware version of the device

Note: Firmware is Program contain in the CPU, use for control all device functions

2.9 How to Save a Setting 6

After user has been done for all setup from 1 to 5 user has to save the setting every time

2.10 How to reboot Datalogger 7

Restart the device

2.11 How to Exit the Setup Menu 8



Exit the setup mode and return to the monitor mode

3. Recording Data


3.1 Record Mode

DL2200 has 3 types of record mode which are Manual, Schedule and Digital Trig. All of them can be select either by panel device (see topic **2.4**) or DL2200 Utility Program for the setup

Manual – Start and Stop recording data by push on the button

- ❖ In order to start recording data push on  button and hold for 2-3 second, then the message “Starting” will appear on monitor display and Record LED appear blinking green light, This mean data has been started read and recorded
- ❖ In order to Stop recording data Push on  button and hold for 2-3 second, then the message “ Stopping” will appear on monitor display and Record LED appear green light, this mean file has been saved and stop recording data

Schedule – set the time for recording data. The data will be record at the time that user set up.

- ❖ In order to set the time, Push  Button and hold for 2 second for switching from monitor mode to setup mode, then select on **Record Menu -> Select Mode** select Schedule Mode and choose **Record Menu -> Set Schedule** Detail as follow:
 - *Start* -set up date/month/year for starting record data
 - *Finish* -set up date/month/year for stopping record data
 - *Work On* -set up the start time for recording data for each day 24hour/60min/60second
 - *Work Off* -set up the stop time for recording data of each day
 - *Week (Work Day)* -select the day to recording data in each week. SMTWTFS are abbreviation of days, start from Sunday thru Saturday

Note: if user set the started point as 00/00/00, it means that it is no end point (No stop). If user set Work On = Work Off, it means that the device will operate 24 hours.

Digital Trig – Recording data is control by Digital Input Signal (DI1). Therefore, data will be start recording when Digital Input Signal received logic “1” and will be stop recording when Digital Input Signal received logic “0”

3.2 Store Time Set up

Store time can be set by go to **Record -> Store Time** the smallest interval for store time is 1 second. For example, if user set the store time = 1 minute, it means data will be record in every minute.

3.3 How to use Average Mode

In case, user want to find the average value of Analog Input Signal and want to find a mean of unstable signal before device records data into memory card. There all can be done by select **Record Menu->Average**. how many times for reading signal would be unit for this value and record onto SD/MMC memory card. The setup value has to be relate to store time for example if store time = 10 second, user can set up average value as 10, 5 and 2(Divisibility Number of Store Time). If user set as 5, it mean that device will read data 5 times before calculate the average value. However, in this case, it is 2 second and then record data in to memory card as 1 record

3.4 How to choose recording channel (I/O Enable)

Selecting "Enable" = Record data that receive from channel signal.

Selecting "Disable" = Do not Record data that receive from channel signal.


- ❖ **Record->AI Enable** set up the signal port that want to record data (Enable, Disable)
- ❖ **Record->DI Enable** set up the signal port that want to record data (Enable, Disable)
- ❖ **Record->DO Enable** set up the signal port that want to record data (Enable, Disable)
- ❖ **Record->CT Enable** set up the parameter for counter data (Enable, Disable)

3.5 Remove or Change SD/MMC Memory Card

*Before remove or change Memory card device has to be stop recording any data (Record LED = Green Light). **If user removes the memory card while Datalogger is still recording data, the Alarm will ring** and error message will appear on LCD display monitor. Moreover, the running file will be incomplete and unable to open the file. However it can be fixing by:*

- ❖ Insert the memory card and then data will continually record until the file is complete, after that file will save and stop record data

***** Note** to get back to normal working status, user has to manually stop


recording process by push  and hold for 2 second. recording process will stop and waiting for the new recording process.

Appendix

T.1	Code of Analog Input				
Code	Input Type		Measuring Range	Resolution	Accuracy (%FS) (Temp. 25 °C)
0	Not Use		—	—	—
1	Thermocouple	R	0 – 1700 °C	1 °C	±0.2% (3.4 °C)
2		S	0 – 1700 °C	1 °C	±0.2% (3.4 °C)
3		K	(-)250.0 – 1300.0 °C	0.1 °C	±0.2% (2.6 °C)
4		E	0.0 – 1000.0 °C	0.1 °C	±0.2% (2.0 °C)
5		J	(-)200.0 – 700.0 °C	0.1 °C	±0.2% (1.4 °C)
6		T	(-)250.0 – 400.0 °C	0.1 °C	±0.2% (0.8 °C)
7		B	600 – 1800 °C	1 °C	±0.2% (3.6 °C)
20	R.T.D	Cu10	0 – 150 °C	1 °C	±0.1% (1.5 °C)
21		Pt100	(-)200.0 – 800.0 °C	0.1 °C	±0.1% (0.8 °C)
22		Pt1000	(-)200.0 – 800.0 °C	0.1 °C	±0.1% (0.8 °C)
30	R (Ohm)	600 Ω	0.00 – 600.00 Ω	0.01 Ω	±0.01% (0.06 Ω)
31		1200 Ω	0.0 – 1200.0 Ω	0.1 Ω	±0.02% (0.24 Ω)
32		4000 Ω	0.0 – 4000.0 Ω	0.1 Ω	±0.02% (0.8 Ω)
40	Voltage(mV)	0 – 80	0.000 – 80.000 mV	1 μV	±0.1% (8 μV)
41		0 – 150	0.00 – 150.00 mV	10 μV	±0.02% (30 μV)
42	Voltage (V)	0 – 1	0.0000 – 1.0000 V	100 μV	±0.05% (500 μV)
43		0 – 5	0.000 – 5.000 V	1 mV	±0.04% (2 mV)
44		0 – 15	0.000 – 15.000 V	1 mV	±0.02% (3 mV)
45		0 – 30	0.00 – 30.00 V	10 mV	±0.033% (10 mV)
60	Current(mA)	4 – 20	4.000 – 20.000 mA	1 μA	±0.01% (5 μA)
61		0 – 20	0.000 – 20.000 mA	1 μA	±0.01% (5 μA)
62		0 – 40	0.000 – 40.000 mA	1 μA	±0.05% (0.0 A)

Appendix A. Hot Key

- ❖ Start or stop record data

Push  Hold for 3 second.

- ❖ Reboot

Push      Hold for 3 second.

- ❖ Temporary change the display mode (Monitor mode only)

Push    OR   

- ❖ Select Analog Input Signal for display on LCD (Monitor Mode/Display Analog Mode)

Line 1 = Push    OR   

Line 2 = Push    OR   

Appendix B. Meaning of error message

- ❖ ER01 = Initializing Card -> Fail -Reading process from SD/MMC memory card, is error
- ❖ ER03 = File System Error
- ❖ ER04 = Memory card full
- ❖ ER05 = Can't create file or File No. exceed the maximum (65535 files)
- ❖ ER21 = Logging fail -> Remove card when data logger are logging.
- ❖ ER22 = Logging fail -> File can't close properly. (Fix by insert memory card back into the slot)
- ❖ ER23 = Logging fail -> File can't write.

Edit: 26/06/2023