

# iLOGPlus – TECHNICAL PRESENTATION

## Alarm inputs

The RTU includes four (4) high-resolution analog inputs (AI1 – AI4) used for registering and recording analog signals such as temperature, humidity, pressure, level, etc. All data are stored in the internal memory of the RTU that has a capacity of 512KB. Any PT100 sensor can be directly wired and used. In order to use other temperature sensors, they must provide an outputs such as 4-20mA output, 0-10V, etc. User defined parameters include:

- User adjustable scales regarding measurements. For example, -30 to +100 degrees Celsius when measuring temperature, 0-100% for humidity, 0-10 Bar when measuring pressure etc.
- User defined high and low alarm levels and thresholds for each input. When there is a breach of the high or low limit the appropriate H or L alarm is issued. For example trigger a high alarm when ambient temperature is over -10 degrees Celsius.
- Micrometric adjustments to enhance the sensitivity & linearity of the sensor. By adjusting such parameters users can accomplish accuracy & sensitivity of 0.1% although the sensors provide 1% accuracy.
- Selection of data logging mode: continuous, average, moving average, high/low, etc
- Alarm logging and acknowledgement using annunciations via email, SMS (if a GSM modem is attached), or email over SMS (e.g. [6974555444@isp.com](mailto:6974555444@isp.com))

## Digital Inputs

The data logger includes four (4) digital inputs (DI1 – DI4) to measure and record digital states (on/off).

Digital input related functions include:

- Acknowledgement and recording of external digital events e.g. open or closed switch, high/low level, intrusion, etc.
- On event to trigger data logging for a latched analog input, e.g. if input DI1 is ON then start to record analog signal in input AI1, when DI1 is in state 0 do not record AI1.
- Record frequency signals (inputs DI3 and DI4 up to 1Khz) such as KWh, Wind speed, flow, etc.
- Record frequency related events (DI3 and DI4) e.g. how many times a motor has started within a given period.
- Remote monitoring of events e.g. lights on, AC on, battery charging on, etc.

## Digital outputs

The RTU includes two (2) digital relay outputs (DO1, DO2).

Digital output related functions include:

- Alarm activation when data logging limits are breached e.g. to trigger a visual alarm (revolving red light, etc.), trigger a digital start/stop event, etc. Alarm acknowledgement by local user intervention e.g. pressing an appropriate button on the keyboard of the device, etc.
- Both outputs can be remotely handled, either via the internal web server and a simple Browser, or by the use of the iBASE software. Remote SMS control is also possible if the logger has an attached GSM modem.

### **Data Records**

Recording capabilities, user defined data logging parameters and functions include:

- User defined logging rate (2-10,000 sec), e.g. log every 900sec.
- Memory mode e.g. record measurements logging average values, or the highest readings, or the lowest readings, or instant readings, etc.
- Record in linear memory mode using a FIFO memory for both analogue and digital measurements.
- Record and automatically delete data upon completion of data transfer
- Record continuously until the memory is full (and a local user deletes it).
- Record in a circular memory mode. This mode satisfies the standards set by the European legislation 92/2/EEC (it satisfies the demand for temperature & humidity logging of each channel every 15 minutes with a full memory capacity for one calendar year).

### **Alarm Events**

iLOG™ has various capabilities related to alarming with local and remote functions. According to the client's specifications exemplary functions will be illustrated as follows:

- Alarm settings for each analogue input e.g. In a measurement scale of -100oC to +100oC (total resolution 200oC), users can set alarm High at -20oC and alarm Low at +20oC.
- Prealarm settings and thresholds for each alarm in the form of percentage e.g. 5% in a resolution of 200oC (previous example) means 10oC prealarm setting in between the high and low alarm. When >10oC the high alarm prealarm will be issued. When <10oC the low alarm prealarm will be issued.
- Dead-zone setting in the form of percentage e.g. 1% in a resolution of 200oC (previous example) means a 2oC setting below the high and low alarm limit. When 2oC are reached and a prealarm and alarm have already been issued the alarm will remain valid until the temperature reaches 18oC and less. Similarly the temperature has to rise from -18oC (-17oc) to exit the low alarm state.

- Alarm-delay in the form of time, e.g. even though all alarm states have been met for an alarm, wait for X minutes, or don't wait, until issuing an alarm. Usually used for peaks that do not matter e.g. defreezing, sea waves, etc.
- Alarm annunciations via email, SMS and email over SMS in the form of , 'station name, time, date, channel, and alarm high/low". If alarms do not reach recipients immediately, the device retries 3 times to send alarm data, if it fails it retries to send them at the next scheduled data transfer.
- Alarm acknowledgements using the device's keypad e.g. An alarm has been issued and a recipient has been informed, then he can get to the device and perform a local acknowledgement. When an alarm is locally acknowledged the device can also send respective alarm annunciations via email, SMS and email over SMS that the alarm situation has been met. If no local acknowledgement takes place then no such record is kept and the alarm stays valid until the state of alarm is no longer valid e.g. temperature rises at normal levels.

At any case all alarms and acknowledgements (if they occur) are logged and transferred along with the measurements data via the selected route (email, ftp, or socket commands – full online).

### **Transmission and remote data monitoring**

The RTU can be set for automatic data transfer at user-defined schedules.

Transfer functions can be performed for either local or remote PCs using Ethernet or Internet connections. The RTU has built in all the necessary data transfer protocols does not need PCs in order to function, furthermore it can be scheduled to operate fully automatically. The device is also completely independent from any special communication software (unlike most of previous generation data loggers). Data transfer is performed using standard file types (according to international industrial standards and not proprietary protocols) like CSV, ASCII, EXCEL format. e.g. when programmed to send logged data via email, the device will send emails with the data in plain text format, attached to the email.

The following main functions are supported by the RTU:

- Data transfer scheduling, e.g. set the data transmission period at every 10 minutes with a daily synchronization time at 22:00, etc.
- File transfer to a local or remote PC using FTP services
- File transfer to a local or remote PC using SMTP services
- Online communications using socket TCP connection.
- Data transfer using email and attachments (1-5 recipients).
- Announcing alarms using email (1-5 recipients).
- Announcing alarms using SMS (1-5 recipients).
- SMS transmission can be achieved with one of the two following ways:
  - Connecting a GSM modem to the RS232 port of the device.
  - Sending an email to one of the mobile telephony services which automatically transmits the email as an SMS to the recipient.

- Monitoring the instant measurements and the parameters of the device using a common browser (Explorer, Navigator, etc.) in the web address of the device in the Internet. Prerequisites for this function include any of the following:
  - The device has to be permanently connected to the Internet - fixed IP case.
  - The device has to be connected to the Internet over a dynamic IP connection but be accessible through port routing (port redirection on an internet router with a fixed IP address).
  - Local data transfer by using the RS-232 serial port or using the optional iRDA infrared port of the device and a laptop. For data transferring the XMODEM protocol is used.

If the device is connected to the internet only occasionally for the transmission of the alarms and the data transfer then the monitoring of the process can be achieved through the following special procedure which requires an installation with a GSM modem connected to the RS232 port of the device: Transmission of a certain command through SMS to the device iLOG™. The device is connected to the Internet and sends an SMS to the recipient, which includes the IP address given to the device by the Internet provider. The user connects to the web page through the browser and sends a command to terminate the connection to the SMS device after completing the procedure.

### **iBASE™ - iLOG™ RTU management PC software**

The iBASE™ software is a modern windows application. This application offers local user functions regarding data management of measurements and RTU calibration. It includes functions such as:

- Automatic data collection via FTP, SMTP/email, or online.
- Automatic data storage on a built in relational database.
- Data visualization using tables, charts, multiple channel projections, etc. for selected stations and time periods.
- Screen and printer reports of data and charts.
- Export of reports and data to popular formats such as Word, Excel, Access, ASCII.
- Remote iLOG™ calibration and parameters setting.

The application functions as a Client/Server file sharing application with a built-in database fully incorporating all the advantages of modern networking such as the Internet and IP based telecommunications.

Data collection is performed via FTP and EMAIL servers, and/or online.

The number of users that can be served is unlimited and can even be from any place on the world using a simple dialup Internet connection. The application is in executable form and the built-in database has been developed in the 4<sup>th</sup> Dimension RAD development platform (ACI USA). The PC operating system should be Microsoft Windows 2000, XP, or NT (Windows Me, 98, 95 are not recommended although supported).