Miro Auxiliary I/O Module

The Miro Auxiliary I/O Module (Figure 1) is a peripheral device that connects to the Miro range of products to augment its existing input channels with additional input and output channels (I/O) to expand the applicability of the Miro. This facilitates easy and straightforward monitoring of assets at a fraction of the cost, compared to dedicated, standalone systems. A typical application would be condition monitoring of transformers.

Figure 1: Miro Auxiliary I/O Module
Dimensions: (130 x 180 x 60) mm

Currently, the system accommodates six channels, which can be a combination of the following:

- Analog input (voltage signal)
- Analog input (current signal)
- Digital input (general)
- Digital input (pulse)
- Analog output (voltage signal)
- Analog output (current signal)
- Digital output (relay)
- Digital output (open collector)

Using Citrus, CHK PQ's proprietary software, logged data from all I/O channels can be displayed together with Power Quality metrics, enabling the user to easily draw correlation amongst measurements.

Models are currently available:

- Miro-Aux I/O 40. This model has four inputs (4 x current) and no outputs; and

Other input and output configurations are available upon request.

Key features / benefits

- Double insulated with isolated input channels and input protection to withstand overvoltage transients.
- Modular card system, so I/Os can easily be configured to suit the application.
- A single system utilising the PQA as the base platform to integrate all sensor inputs. External measurements can be displayed with relevant PQ measurements and correlations identified and analysed.
- Quick and easy software configuration, setting of exceedances and generating outputs using logic tables.

Configuration of the Auxiliary I/O Module

AUX-I/O tab

The AUX-I/O tab, available in the configuration menu provides an option to select "Module Type" and to configure parameters for the various fields.

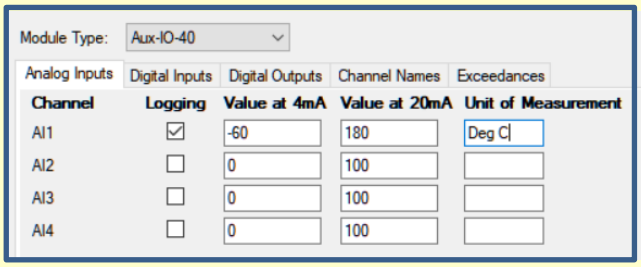

Figure 2: Module Type Aux-I/O-40, Analog Inputs selected

An example configuration is shown in Figure 2. Logging a temperature sensor with a 4-20mA output connected to the first analog channel with lower and upper limits given by -60°C and 180°C. Users can override the default values displayed.

As shown in figure 3, an Exceedance is set when the temperature rises above 168°C and resets when the temperature falls below 156°C.

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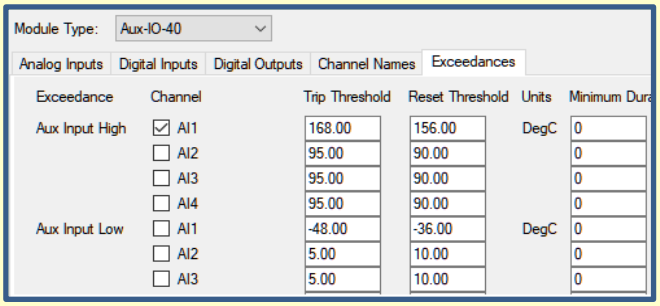

Figure 3: Module Type Aux-I/O-40, Exceedances selected

Logic Functions to generate alarms/notifications

The Logic Function tab, available in the configuration menu, provides logic options for the generation of alarms and notifications.

The example shown in Figure 4 shows that the Truth Table is set only when an Exceedance occurs on; (a) the Auxiliary AI2 channel; and (b) for the VTHD metric on phase A. The Truth Table initiates two outputs: (1) logs the state change of the Truth Table; and (2) triggers the captures as outlined in the Capture Types tab.

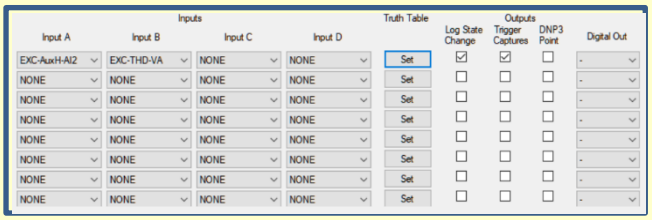

Figure 4: Logic Function selected

Other output routes to DNP3 and to physical digital outputs (D01, D02 and D03) are available.

Applications

Typical applications of the Miro Auxiliary I/O module include:

- Comprehensive monitoring of power transformers in a substation (Figure 5);
- Troubleshooting vibration issues in large motors; and
- Monitoring gas pressures in gas insulated circuit breakers.

Comprehensive substation power transformer monitoring and alarms

The Miro together with the Miro Auxiliary I/O Module can be configured to provide comprehensive substation power transformer monitoring (Figure 5).

Features include: Geomagnetic DC current; dissolved gas; Moisture; OLTC operation; winding temperature; oil temperature; fan operation and more.

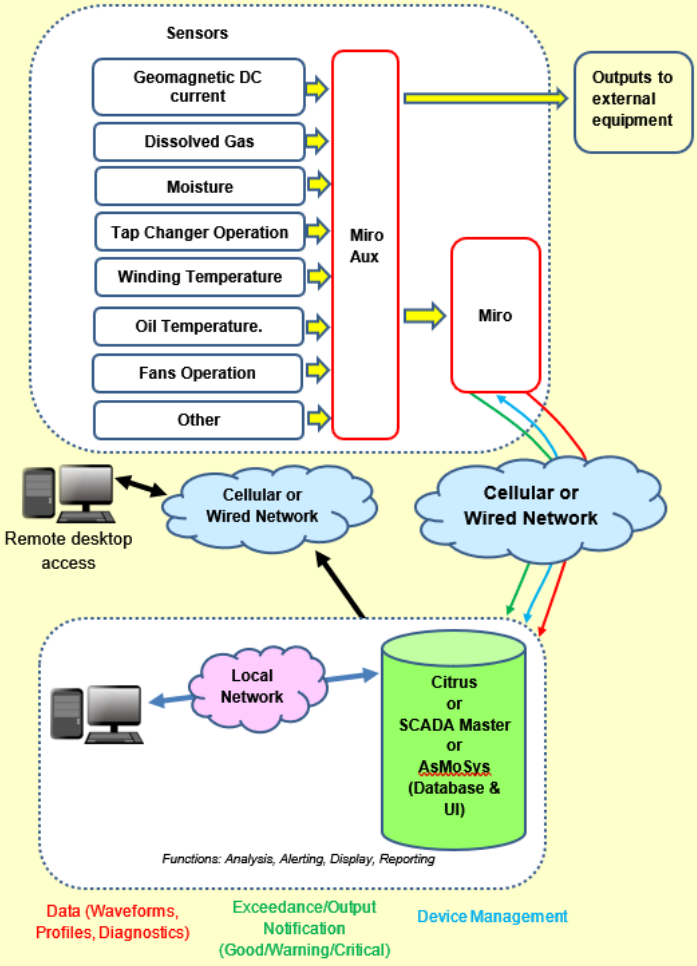

Figure 5: System diagram for power transformer monitoring

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Miro Auxiliary I/O Module Data Sheet

PARAMETER	DESCRIPTION
Input Circuit Board	
Number of channels	4
Signal type	4-20mA
Typical Input Impedance	300 Ohms
3dB bandwidth - lowpass	5Hz
Differential DC overvoltage withstand	24V (indefinite)
Differential impulse voltage withstand	1.5kV (1.2/50μs waveshape)
Common mode impulse voltage withstand	5kV (1.2/50μs waveshape)
Maximum Y1 capacitance on source power supply	33nF
Dielectric withstand voltage between inputs and Miro	10kV DC
Cable shield	Connects to local ground
Accuracy	+/- 1% of reading over temperature range.
Measurement Channel	
A to D Conversion	13-bit resolution
Sampling Rate	10 Samples per second.
Environment	
Operating Temperature Range	-20°C to 65°C
Ingress Protection	IP40
Altitude	2000m
Use	Indoors, otherwise waterproof enclosure must be provided.
Mechanical	
Enclosure Dimensions	(180 x 130 x 60) mm
Weight	0.9Kg
Case Material and Colour Scheme	Polycarbonate, moulded in light grey.

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