FE-390-IF
Serial Interface Module

RS232 Control

- ● REMOTE CONTROL OF FYLDE MODULES

- ● RS232 ASCII COMMAND INTERFACE

- ● SINGLE OR MULTI CHANNEL CONTROL

- ● COMPACT SIZE, L56 x W40 x H16mm

- ● POWERED BY RACK (10mA)

- ● WINDOWS GUI APPLICATION AVAILABLE FOR FE-389-TA MODULES

The FE-390-IF is a compact module that provides remote control of compatible Fylde modules.
The unit connects to the rear of racks fitted with remote enabled 15-way D connectors and is powered by the rack. A 2nd D connector (9-way) provides a standard RS232 link to a PC. ASCII commands sent from a terminal program such as Hyperterminal or RealTerm set the parameters of individual or multiple modules in the rack. Settings can also be retrieved and viewed remotely from modules.

A Windows based LabView program is available to provide a graphical control interface. This is currently for racks fitted with FE-389-TA modules with potential future versions including more module types.

Compatible modules and remote functions available.

1. FE-389-TA Gain: bridge volts, filter, panel lock, auto-zero, auto-balance, calibration setting.

2. FE-930-IE: Gain, current setting, filter setting.

3. FE-937-SGA: Gain, current setting, calibration setting.

4. FE-979-TA: Gain, bridge volts, shunt cal, filter in/out, auto-zero, auto-balance.

5. FE-960-IA: Gain.

6. FE-961-IA: Gain.

General Description

The FE390IF is a plugin adaptor which provides a serial RS232 interface between a user terminal and a Fylde rack populated with compatible modules.

The serial interface plugin adaptor consists of a small enclosure and 2x "D" connectors, 1x 15way which plugs into the Remote connector on the rear panel of the rack system and 1x 9way for the RS232 serial connection.

Modules Controlled :

FE-530-IE, FE-537-SGA, FE-579-TA, FE-930-IE, FE-937-SGA, FE-979-TA, FE-389-TA, FE-960-IA, FE-961-IA or any mix of these.

User Terminal Settings :

19200 baud, 8 bit , 1 start, 1 stop, no parity.

Electrical Power:

Power provided from the system it plugs into (9-36VDC)

Physical :

Approximately 58mm x 40mm x 17mm

1.0   General Arrangement

The FE-390-IF module provides a serial (RS-232C) interface to a system comprising one or more Fylde FE-389-TA, FE-979-TA, FE-930-IE, FE-937-SGA, FE-960-IA or FE-961-IA amplifiers.

The FE-390-IF will still work with following archived modules:
FE-579-TA, FE-530-IE or FE-537-SGA.

The user enters text in response to a prompt to control the amplifiers modules.

1.1   Power Supply

The module is powered by the rack to which it is connected via the 15 way D connector.

1.2   Communications Settings

The communicating terminal must be set to 19,200 baud, 8 bit data, no parity, 1 start bit, no flow control.

1.3   Connecting Cable

A 9 pin 'D type' cable is required to connect between the module and the terminal device, typically a PC.

If using a PC not equipped with a 9 pin RS232 port then a USB to RS-232 adapter should be used.

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2.0   Installation.

2.1   Case or Rack.

Cases and racks available with a compatible connection to the FE-390-IF together with FE-389-TA, FE-579-TA, FE-530-IE, FE-537-SGA, FE-930-IE, FE-937-SGA, FE-979-TA, FE-960-IA and FE-961-IA amplifiers as follows:

1.	FE-PE4	Up to 2 channels of FE-389-TA or 4 channels of other modules.
2.	FE-PE8	Up to 4 channels of FE-389-TA or 8 channels of other modules.
3.	FE-PE17	Up to 8 channels of FE-389-TA or 16 channels of other modules.

The FE-PE17 may be rack mounted if required by use of an optional bracket; all other cases are for bench operation.

In general, amplifiers purchased will be supplied ready assembled in prewired mounting crates with rear panel connections completed.

Mentioned 9-Series modules and FE-389-TA are only available as DC powered, others are mains powered.
Care must be taken never to insert a DC powered module into a rack wired to accept mains powered modules. Racks suitable for DC powered amplifiers always have rear panel connectors for DC inputs and are marked with the rated DC input voltage.

2.2   Connection of the Terminal Equipment.

Connect the 15-way female D connector on the FE-390-IF labelled "Remote", directly to the 15-way male D-type connector on the rack. Using a 9 pin D-type connecting cable, typically male to female, connect the terminal equipment (typically a PC) to the 9-way female D connector on the FE-390-IF. Set the terminal equipment to 19,200 baud, 8 bit data, no parity, 1 start bit, no flow control.

2.3   Power connection.

The FE-390-IF is power is supplied via the 15-way D-type connector on the rack. No additional power supply is required.

2.4   Setting Amplifier Addresses.

Each amplifier in the system has a unique channel number in the range 1 to 16.

There's a procedure to set the channel number for each amplifier which should be used when the system configuration is changed, e.g. when a new amplifier is added to the system.

The procedure for five series modules is as follows (FE-530-IE/ FE-930-IE, FE-537S-GA/ FE-937S-GA, FE-579-TA/ FE-979-TA).

Remove all amplifiers from the system and connect the FE-390-IF module.
Fit the amplifier into any slot.
Power up and wait for the "->" prompt. There will be a delay at this point as the FE-390-IF module queries all channels for all module types. Once the prompt is displayed type **set** followed by the return key.
For the amplifier you want to designate as channel 1 press and release the **set** button. At the terminal now type the number **1** followed by the return key. "Channel 1 set" should be displayed.
Power off and remove the channel 1 amplifier. Insert the next amplifier into any slot.
Power up and wait for the "->" prompt.
At the terminal type **set** followed by the return key. On the channel 2 amplifier press and release the SET button.
Type the number **2** followed by the return key. "Channel 2 set" should be displayed.

Repeat for all amplifiers in the slots you want to use.

For the FE-389-TA the procedure is the same as above but instead of pressing the set button hold down the main dial while setting the channel number.

For FE-960-IA and FE-961-IA modules the procedure is the same but press and hold the down arrow button while setting the channel number.

3.0   Operation

3.1   Commands entered at the terminal
(A basic LabView Windows PC program is in development to provide a graphical interface control which will be freely available, please enquire.)

Set the terminal to 19200 baud 8 bits, 1 start bit, 1 stop bit, no parity, no flow control.

On the first power up the module sends up to 16 lines of text to the terminal as it queries as many as 16 channels.

Each line has the format "Channel X is FEYYYYY" or "Channel X not present"
where X is 1 to 16 and YYYYY is one of "FE937SGA" , "FE930IE" or "FE979TA"
This can take up to 30 seconds as each channel is scanned for all card types and waits briefly for a response.
The number of channels scanned can be set using the **count** command to reduce this time, see below.

The module then displays the prompt "->"

The module responds to the following commands.

Note that all user text including commands are terminated by either the **carriage return** character, **newline** character or the **space** character, ASCii values **0x0D, 0x0A or 0x20** respectively.

"**reset**" : Causes the channels in the system to be scanned and the module types established in each.

"**set**" : Causes the module to prompt "address value ? ->". Follow section 2.4 for this command.

"**channel**" causes the module to prompt "Channel number ? ->". The user (terminal) responds with one of:
a number from **1** to **16** or
or the text "**FE530IE**" to select all FE930IE/ FE530IE amplifiers in the system.
or the text "**FE537SGA**" to select all FE937SGA/FE537SGA amplifiers in the system.
or the text "**FE389TA**" to select all FE389TA amplifiers in the system.
or the text "**FE579TA**" to select all FE979TA/FE579TA amplifiers in the system.
or the text **"FE960IA"** to select all FE960IA amplifiers in the system.
or the text **"FE961IA"** to select all FE961IA amplifiers in the system.

"**count**" causes the module to prompt "**Number of channels? ->**" . The user (terminal) responds with a number from 1 to 16 and this sets the number of channels that will be scanned in future. Use this if there are less than 16 channels in your system to avoid the module needlessly scanning for channels that aren't there.

To each of the following commands the module prompts : "setting->"
The user enters a step number (see below) or the "**?**" character.

The following three commands only apply to the FE930IE, FE530IE amplifier

"**gain**" : gain steps **1..6** are x1, x3, x10, x30, x100, x300
"**current**" : excitation current steps **1..3** are 0 mA, 4 mA, and 8 mA
"**filter**" : low pass filter steps **1..2** are Filter Out and Filter In

The following three commands only apply to the FE937SGA, FE537SGA amplifier

"**gain**" : gain steps **1..4** are x100, x300, x1000, x3000
"**current**" : excitation current steps **1..3** are 5 mA, 10 mA, and 20 mA
"**cal**" : cal steps are **1..2**, Off, On

The following six commands only apply to the FE979TA, FE579TA amplifier

"**gain**" : gain steps **1..8** are x1, x3, x10, x30, x100, x300, x1000, x3000
"**volts**" : bridge volts steps **1..4** are +1V, +2V, +5V, +10V
"**shunt**" : shunt steps **1..2** are Shunt Off and Shunt On
"**filter**" : Low pass filter steps **1..2** are Filter Out and Filter In
"**azero**" : Steps **1..3** are Init, passed, and failed. (Enter only "**1**", the other values are for status reporting only.)
"**lockbal**" : Balance Lock steps **1..2** are Bal Unlock and Bal Lock (When locked, auto balance is not used during zeroing)

The following single command only applies to the FE960IA amplifier.

"gain" : gain steps **1..5** are ÷100, ÷10, x1, x10 and x100

The following single command only applies to the FE961IA amplifier.

"gain" : gain steps **1..9** are 2V Full Scale, 10V FS, 20V FS, 100V FS, 200V FS, 400V FS, 800V FS, 1k6V FS, 2k5V FS

The following six commands only apply to the FE389TA amplifier.

"**gain**" :   Gain steps for cards with pre-amp module, **1..11** are x5, x10, x20, x50, x100, x200, x500, x1k, x2k, x5k, x10k.
Gain steps for cards without pre-amp module, **2..10** are x10 (2), x20, x50, x100, x200, x500, x1k, x2k, x5k (10).

"**volts**" :   Bridge volt steps **0..12** are 0V, 1V, 2V, 3V, 4V, 5V, 6V, 7V, 8V, 9V, 10V, 11V, 12V.

"**filter**" :   Low pass filter steps **1..8** are 300Hz (1), 1kHz, 3kHz, 10kHz, 30kHz, 100kHz, 300kHz and wide band (8).

"**lock**" :   Front panel lock, steps **1..2** are unlocked (1), locked (2).

"**AZ**" :   Auto-Zero, user step is **1** for run. (2 and 3 are passed and failed for query only.)

"**azState**" : Auto-Zero state, steps are **1..3**, AZ in (1), AZ Locked (2) and AZ Out (3).

"**azMode**" : Auto-Zero mode, steps are **1..2**, Single gain (1), All gains (2).

"**signal**" : Signal in zero relay, steps **1..2** are signal in normal (1), signal in grounded (2).

"**bal**" :   Auto-Balance, user step is **1** for run. (2 and 3 are passed and failed for query only.)

"balState" : Auto-balance state, steps **1..3** are Bal In (1), Bal Locked (2) and Balance Out (3).

"cal" :   Cal signal, user steps **1..4** are RCal_Selected (1), VCal_Selected (2), RCal_Active (3) and VCal_Active (4).

The following are commands for the LabView graphical interface but can be typed at the console if so desired.

"hiBW" : Query only for the pre-amp module and if the filter is in our out.
Responses are "no preamp", "preAmp, filter out", "preAmp, filter in".

"negLimit" : Query only, for negative limit. Responses are "not neg limit", "negative limit".

"posLimit" : Query only, for positive limit. Responses are "not pos limit", "positive limit".

3.2   Responses to commands entered at the terminal

Responses to "**?**" for each setting.

For the FE930IE & FE530IE amplifier:

The response to the "gain", "setting->", "?" sequence is one of "x1", "x3", "x10", "x30", "x100", "x300"
The response to the "current", "setting->", "?" sequence is one of "0mA", "4mA", "8mA"
The response to the "filter", "setting->","?" sequence is one of "Filter Out", "Filter In"

For the FE937SGA & FE537SGA amplifier:

The response to the "gain","setting->","?" sequence is one of "x100","x300","x1000","x3000"
The response to the "current","setting->","?" sequence is one of "5mA","10mA","20mA"
The response to the "cal","setting->","?" sequence is one of "Cal Off","Cal On"

For the FE389TA amplifier:

The response to the "gain","setting->","?" sequence is one of "x5"*,"x10","x20","x50","x100","x200", "x500", "x1k", "x2k", "x5k", "x10k"*
The response to the "volts","setting->","?" sequence is one of "0V", "+1V","+2V", "+3V", "+4V", "+5V", "+6V", "+7V", "+8V", "+9V", "+10V", "+11V", "+12V".
The response to the "filter","setting->","?" sequence is one of "300Hz", "1kHz", "3kHz", "10kHz", "30kHz", "100kHz", "300kHz", "Filter Out".
The response to the "az","setting->","?" sequence is one of "AZ Start","AZ Pass","AZ Failed"
The response to the "lockbal","setting->","?" sequence is one of "Balance Unlocked","Balance Locked"

*Only available with the optional FE389TA plug-in pre-amplifier module.

For the FE979TA & FE579TA amplifier:

The response to the "gain","setting->","?" sequence is one of "x1","x3","x10","x30","x100","x300"
The response to the "volts","setting->","?" sequence is one of "+1V","+2V","+5V","+10V"
The response to the "shunt","setting->","?" sequence is one of "Shunt Off","Shunt On"
The response to the "filter","setting->","?" sequence is one of "Filter Out","Filter In"
The response to the "azero","setting->","?" sequence is one of "AZ Start","AZ OK","AZ Failed"
The response to the "lockbal","setting->","?" sequence is one of "Balance Unlocked","Balance Locked"

For the FE960IA amplifier:

The response to the "gain","setting->","?" sequence is one of: "/100", "÷10", "x1", "x10" and "x100".

For the FE961IA amplifier:

The response to the "gain","setting->","?" sequence is one of: "10V", "20V", "100V", "200V", "400V", "800V", "1k6V", "2k5V"**.**