

DATRAN XL4 *PLUS* RTU

QUICK START GUIDE

DATRAN XL4 PLUS RTU

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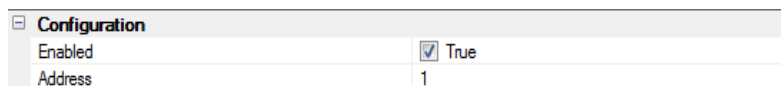
Configuring the XL4 Plus RTU

The XL4 Plus RTU is configured using software called “QTech Workbench”. Connection to your PC is via a USB cable (Type A to Type B).

The configuration software is available for download from the QTech Website. For technical support contact QTech at techsupport@qtech.co.nz

RTU Address

Every RTU has a unique site address so that a DATRAN VI Base Station can communicate with it. When an RTU is installed on site, its address must be configured. Unlike older model DATRAN RTUs, the address for the XL4 Plus is configured using QTech Workbench. The module address can be any number between 1 and 239, when configuring the device to connect to a DATRAN Base Station (serial or ethernet) in Workbench.



Factory Defaults

From time to time, it may be necessary for you to reset the XL4 Plus back to factory defaults. There are two ways of doing this:

- The factory default settings can be loaded back into the RTU using the ‘Factory Default’ button in QTech Workbench screen.
- There is a jumper on the RTU main processor board labelled “INIT”. It is normally open, but if the RTU is started up while the jumper is installed it will cause the RTU to restore the factory default settings. Use this method only if instructed to do so by QTech Staff.

The I/O connectors for the RTU must be disconnected prior to setting factory defaults. It is very important to remove the INIT jumper before reconnecting the connectors.

Status LEDs

The XL4 RTU and XL4 Plus RTU look similar. The XL4 RTU uses a 1 second flash to indicate OK status, The XL4 Plus RTU uses a slow fade of the same LED to give the operator a quick visual indication that the RTU is running OK on XL4 Plus firmware.

- ON : This LED is always on when the XL4 RTU is powered.
- OK : This LED fades slowly on and off to show the CPU has not locked up. If it is on solidly, or stays off, then the RTU needs attention.
- IP : This LED indicates that the RTU is currently sending comms out its IPB port to communicate with I/O expansion modules.
- MU : The MUTE signal from the Radio. This indicates the radio is currently receiving an RF

- signal.
- RX : The RTU modem is receiving and decoding data from the radio. This LED will usually appear to “flicker”
 - KY : This indicates the RTU is attempting to key on the radio transmitter.
 - TX : The RTU is transmitting data through the radio. This LED will usually appear to “flicker”
 - ER : This is the Error Indication LED. The LED will flash a certain number of times to indicate any error messages the RTU has been configured to display.

Error Flash	Message	Error Flash	Message	Error Flash	Message
1	Main Battery Low	5	Dig Output Fail	Continuous Flash	Licence Issue*
2	Clock Battery Low	6	Analog Input Fail	10	Modbus Client (TCP) Error
3	Datran Comms Fail	7	No DLP Loaded or DLP corrupted	11	Qcomms Master (serial) Error
4	IPB comms Fail	8	Modbus Master (Serial) Error	12	Qcomms Server (TCP) Error

Power Supply



The power connector has three connections:

-V : Power Supply Negative

+V : Power Supply Positive, 12 – 30 V DC

O/P: Control Signal Output. This allows the RTU to turn on devices when it is powered up. This was previously labelled “C” on older eXcel RTUs

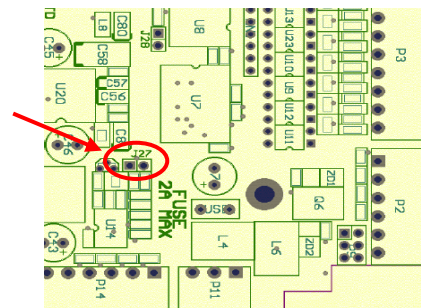
The “O/P” terminal is an OUTPUT. Do not connect it to the supply.

The XL4 Plus and associated peripherals should all share a common earth point.

The RTU can be supplied from 12-30V DC. The RTU is factory configured for a nominal 12V DC supply, unless otherwise requested. When configured for 12V, the RTU will automatically shut itself down when the supply voltage drops to 10.5V.

If the RTU is to be supplied from 24V it is necessary to change J27, located on the Q22 (bottom board) in the RTU. This changes the low voltage shutdown voltage to 21V. The power option is marked on the case label.

Low Voltage Drop Out Threshold	
	J27
12V supply	Installed
24V supply	Open



Ports

There are multiple ports on the XL4 *Plus* RTU:

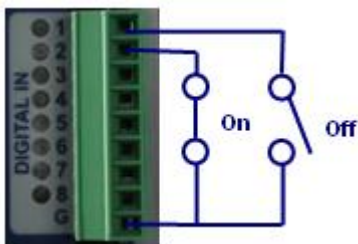
- RS485 (RJ12)
The RS485 port is used for inter-module and Modbus long distance, high speed communications.
- RS232 (RJ45)
The RTU contains two RS232 serial ports used for specialised communication devices and peripherals. These include PLC Interfaces, Cellular modems, Data Radios, modems etc.
- CNFG (A Type B USB)
Used for on-line configuration, diagnostics, and data/program exchange. The port is labelled CNFG on the side panel. It is also used for In-system programming of the firmware.
- Ethernet (RJ45)
The port labelled ETH on the side panel is a standard 10/100-base-T ethernet port with auto polarity reversing (no crossover cables required for peer-to-peer connections). It can be configured for Base Station or peripheral communications via such protocols as QComms, DNP3, Modbus Slave/Master, etc.

The previous Q03 RS485 connectors were RJ10 connector with 4 contacts. Ensure that the 6 contact RJ12 is plugged into the XL4 *Plus* RTU. Do not attempt to insert the 4 contact RJ10 into the RTU, this must be inserted in the expansion module (Q23/Q26 etc).

Inputs/Outputs

Digital Inputs

The XL4 *Plus* RTU digital inputs are designed to interface easily with physical switching devices. They have an internal pull-up resistor that will pull the input terminal to the power supply '+' when the input is open circuit (the "OFF" state).



To turn a digital input ON, connect it (via a set of contacts if necessary) to the common "G" terminal on the Digital Input terminal block. All "G" terminals on the RTU are tied internally to the "G" terminal on the power supply connector. The LED associated with each digital input will light up when the input is Active/On/Closed.

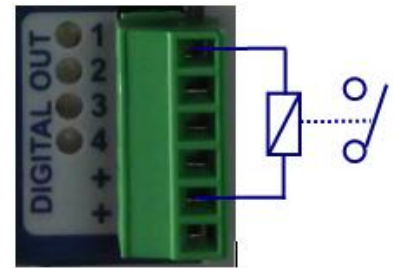
The pull up / pull down convention is different from some PLCs. If required, the active state of I/O can be inverted in the RTU DLP control program or PLC.

Digital Outputs

The XL4 *Plus* RTU Digital Outputs are designed to be easily interfaced with relays and contactors.

The RTU has 8 Digital Outputs in total. Digital Outputs 1 to 4 are located on the front panel adjacent to the Digital Inputs and have LED indicators to show if the output is active or not. Digital Outputs 5 to 8 are located on the underside of the RTU next to the power connector.

The Digital Outputs work as “Current Sinks”. This means that when they are turned on, they will be connected to power supply ground, allowing current to flow into the output terminal to ground. In the “OFF” state, they have a high impedance to ground and will float up to + Supply.



To use a digital output with a relay, wire as shown in the diagram opposite:

Analog Inputs

The XL4 Plus RTU has 6 analog channels. All analog channels are independently capable of operation as either 0-20mA, 4-20mA, 0-5V or 0-10V. In addition to this, channels 5 and 6 are independently able to be configured as either inputs or outputs. The RTU is factory shipped with all analog channels configured as 4-20 mA inputs. For details on how to reconfigure them, refer to the Owners Manual. For all analog inputs, the current return path is via the ground of the RTU power supply. It is important to understand the implications of this when wiring certain analog devices to the RTU, as detailed below.

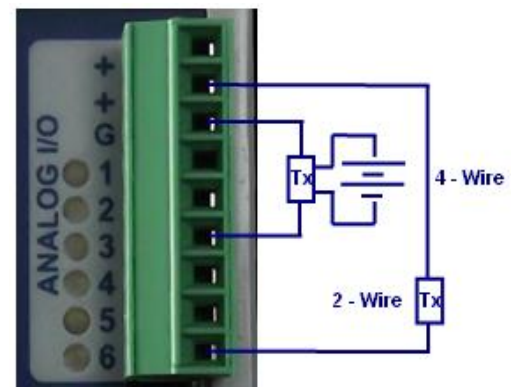
The LEDs adjacent to each Analog Input show the status of the signal the RTU is receiving. If the LED is off, it means the input signal is zero, or under-range. When the LED is on, it indicates the signal is within the measuring range that the input has been configured for. If the LED is flashing, it shows the signal is over-range.

Loop Powered Devices

“Loop-Powered”, or “2-Wire” devices derive their power supply from the current flowing in the loop itself. It is important to make sure that any device is rated to operate at the voltage that will be available to it, taking into account that the RTU Analog Input will drop 5V across it at 20mA loop current.

Separately Supplied Devices

“Separately Supplied”, or “4-Wire” devices are analog transmitters that have a separate power supply from the analog signal loop. If suitable, these devices can be powered from the RTU power supply and wired as shown. If the RTU power supply is not suitable, the analog sensor can be powered from a separate power supply as long as the grounds of both the RTU and the other power supply are connected together.



NOTE: If the system is being powered from 13.7V DC, the analog transducer will only have a maximum of 8.7V available to it for its power supply.

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