X-NUCLEO-PLC01A1

Industrial input/output expansion board based on VNI8200XP and CLT01-38SQ7 for STM32 Nucleo

Features
- Enables a PLC (Programmable Logic Controller) function subset on STM32 Nucleo
- 8x input with CLT01-38SQ7 high-speed protected digital termination array
- 8x output with VNI8200XP high-side solid state relay
- Status LEDs: Fault, Thermal, Power
- IO (input/output) activity LEDs 24 V power supply
- Free comprehensive development firmware library and example compatible with STM32Cube firmware
- Compatible with STM32 Nucleo boards
- Compatible with Arduino UNO R3 connector
- RoHS compliant

Description
The X-NUCLEO-PLC01A1 is an industrial input/output evaluation board which expands the STM32 Nucleo board functionality with a PLC (programmable logic controller) function subset. It is compatible with the Arduino UNO R3 connector layout and is designed around VNI8200XP (solid state relay) and CLT01-38SQ7 (octal digital termination array). The X-NUCLEO-PLC01A1 interfaces with the STM32 MCU via the SPI peripheral. Moreover, it is equipped with a set of diagnostic and activity LEDs to facilitate application debugging. It can accept other STM32 plug-on expansion boards to further extend the STM32 Nucleo board functionality. The X-NUCLEO-PLC01A1 allows the rapid evaluation of the ICs on board performing a basic set of PLC operations in conjunction with the X-CUBE-PLC1 software package. X-NUCLEO-PLC01A1 is not intended to evaluate the single devices at their full specifications. VNI8200XP includes advanced protection and fault detection features. CLT01-38SQ7 provides protection and isolation in industrial operating conditions as well as an 'energy-less' status indication for each of the eight input channels, featuring minimal power consumption; it is designed for situations that are required to pass the IEC61000-4-2 8 kV and 15 kV test standards. Both the CLT01-38SQ7 and the VNI8200XP are designed to meet the most common industrial requirements (i.e. IEC61000-4-2, IEC61000-4-4, IEC61000-4-5 or IEC6131-2); to evaluate them further, refer to the single-product evaluation boards, available at www.st.com.
1 Schematic diagrams

Figure 1: X-NUCLEO-PLC01A1 schematic, part 1

Morpho Connectors

Nucleo Connectors

Note: All Resistors in this section should be SMD0805

SPI activity LEDs
Figure 2: X-NUCLEO-PLC01A1 schematic, part 2
Figure 3: X-NUCLEO-PLC01A1 schematic, part 3
Figure 4: X-NUCLEO-PLC01A1 schematic, part 4

OUTPUT LEDs

Digital isolator
# Revision history

Table 1: Document revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-Jul-2015</td>
<td>1</td>
<td>Initial release.</td>
</tr>
</tbody>
</table>