

NTX-U20 Controller



A powerful, economical solution to upgrade D20 I/O panels

Mindsight ACS NTX-U20 is a cost-effective and feature-rich upgrade solution for GE D20 I/O peripheral panels. The NTX-U20 mounts directly to the existing WESTERM termination boards, eliminating the need to disturb or replace any of the existing field wiring. For the utility, this means up to 60% cost savings over a traditional RTU replacement, since the labor required to re-produce drawings, perform re-cabling, and do extensive point-to-point checkout is vastly reduced. Existing installations can also be expanded through the addition of Mindsait ACS I/O panels to the NTX host, or the use of Mindsait ACS designed replacements for the old WESTERM termination panels.

Features and Benefits

- Powerful, open-system architecture based on ARM 9E 32-bit RISC processor and Linux OS
- Can be integrated with the Mindsait ACS NTX-200 series substation controllers as the master, or with another substation DNP/IP Ethernet control platform
- Plugs directly into existing WESTERM termination panel - no need to touch the existing wiring
- No changes to the existing SCADA system database are required when using the same master protocol
- Replaces proprietary protocol between I/O panels with DNP 3.0/IP - opening the system for easy expansion
- Dual Ethernet Copper or Fiber Optic ports support DNP3 or Modbus TCP/IP or UDP client, server, or multiples of both; also functions as integrated 2-port integrated Ethernet switch
- Large 14,000-point database capacity per module
- Provides time synchronization via IRIG-B (un-modulated), Garmin GPS satellite clock, NTP or DNP3 protocol
- Easily expandable through the addition of Mindsait ACS I/O modules to an NTX-series host controller, or with Mindsait ACS-produced replacement termination panels paired with additional NTX-U20 units
- Easily configured using our intuitive, Windows-based NTX Explorer application
- Achieve NERC CIP compliance with the use of built-in solutions

NTX U20 Controller

NTX-U20/A

The NTX-U20/A panel is the retrofit module for the D20 A. It replaces the WESDAC Analog Logic Panel with a form-fit NTX-U20 I/O Controller and a 32-point piggy-back Analog Input Module, providing plug-in interfaces to the original WESTERM Termination Panel. All analog inputs are differential and bi-polar. The NTX-U20/A utilizes a 16-bit 0+5 Vdc A/D Converter (Configurable for +1Vdc, +2Vdc or +10Vdc). The calibration resistors and transient protection circuitry are maintained on the original WESTERM termination panel. The NTX-U20/A analog system is compatible with the original D20 A peripheral panel inputs. Existing single or redundant 24 VDC or optional 48 VDC power supplies can be utilized or replaced as part of the upgrade.



NTX-U20/A

NTX-U20/D

The NTX-U20/D is the retrofit module for the D20 S status input panel. It replaces the WESDAC Digital Logic Panel with a form-fit NTX-U20 I/O Controller, with a 64-point Digital Input Module providing plug-in interfaces to the original WESTERM termination panel. A variety of input types are configurable per point, including Status, SOE and accumulators. Each input supports time tagging of changes as detected to a resolution of 1ms. Contact wetting is provided from either the on-board D20 24 VDC or optional 48 VDC power supply, or an external supply (e.g., station battery, etc.), as originally configured.



NTX-U20/D

NTX-U20/K

The NTX-U20/K is the retrofit for the D20 K and replaces both the WESDAC Control Logic Module and the WESTERM D20 KR base panel. The NTX-U20/K provides a 16x16 isolated high-current optical driver matrix that replaces the WESDAC D20 K physical relay drivers. The matrix supports two strings of 128 relays each, with up to 256 control relays (128 trip/close pairs), using the original external WESDAC interposing relay panels. Pulse control (AGC) is also supported with up to 16 Raise/Lower external momentary relays. The NTX-U20/K supports assigning relay contact closure times in one-millisecond increments for each relay via DNP3.

All the original external D20 KI & K12 series or other vendor's interposing relay panels are maintained with the upgrade, and replacement interface cables are provided. A local/remote switch is also provided on the form-fit replacement termination panels. The single or redundant 24 VDC or optional 48 VDC power supplies may be utilized or replaced as part of the upgrade.



NTX-U20/K

NTX-U20/C

The NTX-U20/C is the retrofit module for the D20 C combination logic panel. It replaces the WESDAC D20 C Combination I/O Logic Panel with a form-fit I/O Controller that includes a 16-point Digital Input Module, 16-point Analog Input Module (not an option with the NTX-U20/C) and an isolated high-current optical control relay driver controller for up to 32 interposing relay outputs (16 trip/close pairs).



NTX-U20/C

The NTX-U20/C provides plug-in interfaces to the original D20 C WESTERM termination panel for analog and digital input wiring connections, and a control relay cable for connection to external KI or KI2 series or other vendor's momentary or latching interposing relay panels. The NTX-U20/C can also support multiple groups of up to 16 4-20ma isolated analog outputs typically for AGC Setpoint controls (for new installations, the NTX-U20/A or U20/D may also be fitted with multiple groups of up to 16 4-20ma outputs). The NTX-U20/C supports assigning trip/close contact closure times in one- millisecond increments for each relay via DNP3.

With the NTX-U20/C module licensed at shipment, NTX Logic using our ISaGRAF PLC programming languages can also be incorporated into these panels for local PLC programs.

Control Adapter Module

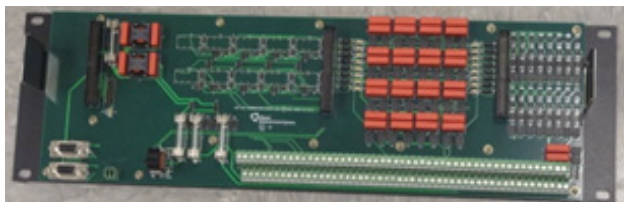
For sites that have hand-wired, heavy-duty relay panels or other control interfaces, Minsait ACS has developed an external adapter module for the NTX-U20/K and NTX-

U20/C models. It has appropriately rated Form A and Form C relay contacts that emulate the original D20 isolated relay driver logic. These relay drivers can support external relay coils rated at 24 VDC, 48 VDC or 130 VDC of either polarity. We are also developing adapters for the various connector or terminal block interfaces supported in the original D20

KR WESTERM base board, so all known external interposing relay installations can be accommodated beyond the basic KI or KI2 relay modules.

Replacement Termination Panels

In addition to the NTX-U20/KT termination panel for the U20/K module, Minsait ACS also offers form-fit termination panel replacements for the following WESTERM panels:



NTX-U20/C termination panel

- D20S (NTX-U20/DD & DZ for 25-pin or Compression TBs)
- D20A (NTX-U20/AD & AZ for 25-pin or Compression TBs)
- D20C (NTX-U20/CD & CZ for 25-pin or Compression TBs)

These panels can be purchased together with our NTX-U20 I/O modules (to expand an existing D20 configuration), or separately (if needed to replace a failed WESTERM termination panel—Minsait ACS NTX-U20 upgrade only).

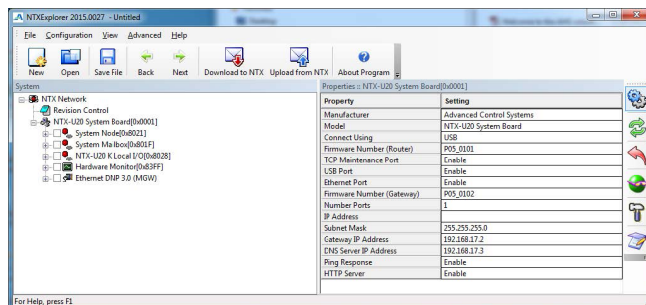
NTX Explorer Configuration Software

NTX Explorer is the application provided for configuring each of the NTX-U20 I/O controllers, as well as an NTX-200 series host controller. NTX Explorer runs on Windows XP, Windows 7, Windows 8 and Windows 10. The NTX-U20 controllers are configured via a connection to the local maintenance port using a mini-USB cable, or remotely

via a secured Ethernet connection. Each I/O panel may be configured for its IP and DNP3 or Modbus addresses, along with all the internal panel database and communications parameters. NTX-U20 Ethernet ports may be configured for up to sixteen IP clients, servers, or multiples of both.

NTX Explorer (via the integrated Monitor feature) allows the user to view, in real-time, all the physical database values configured in each NTX-U20 I/O Controller and diagnose internal or external problems in the field.

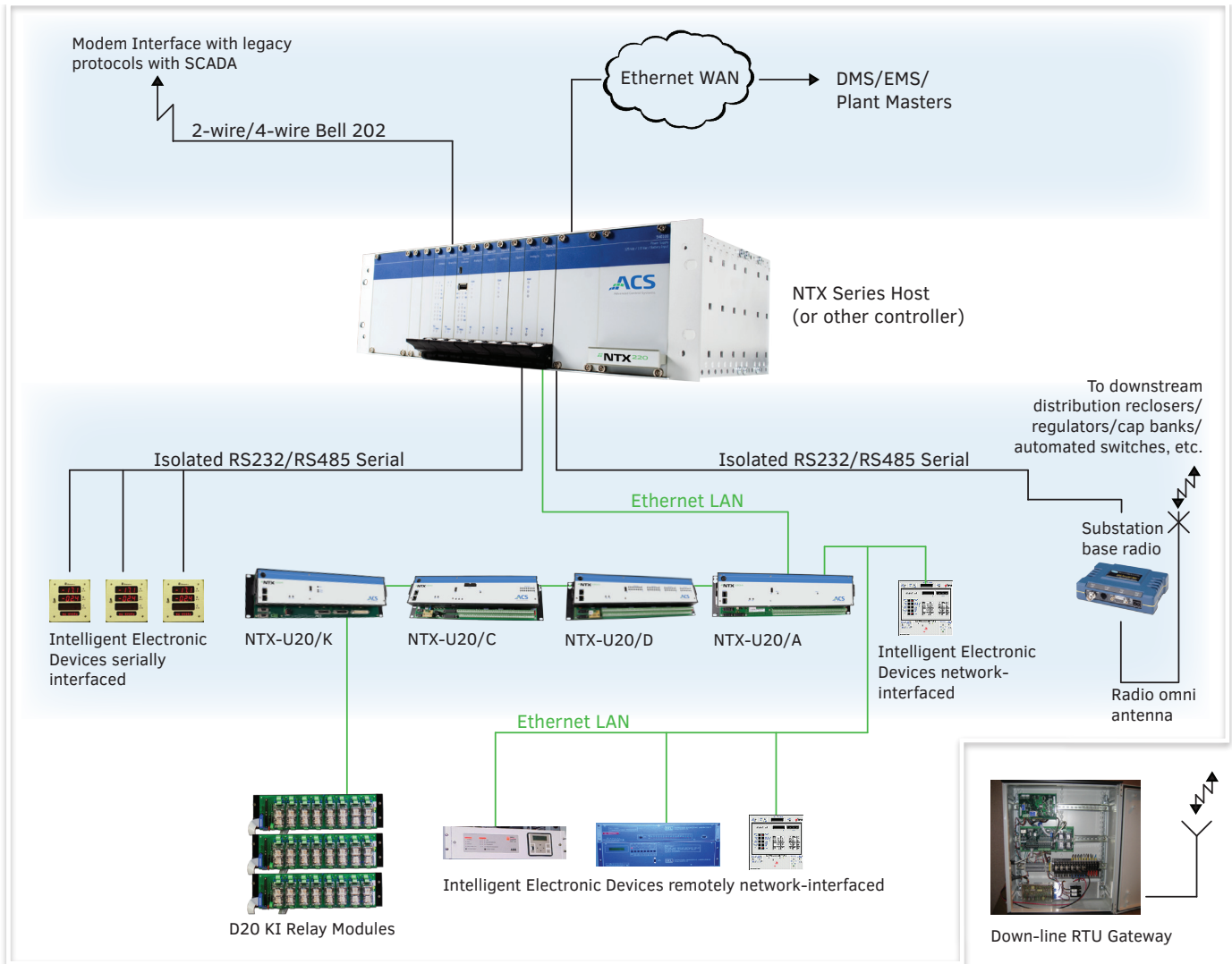
Locally wired or IED I/O values may also be manually overridden for testing purposes and, with password permissions, control relays can be manually operated through the application.



NTX Explorer

NTX-U20 Controller

Example: upgrade architecture using NTX-U20



Minsait ACS, An Indra company

Advanced Control Systems, Inc.
2755 Northwoods Parkway | Peachtree Corners, GA 30071
email: info@acspower.com | 800.831.7223 | acspower.com

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