



An Indra company

# NTX-U20 Controller



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

The Advanced Control Systems™ (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 work required to re-produce drawings, perform re-cabling and do extensive point checkout is vastly reduced. Existing installations can also be expanded through the addition of ACS I/O modules to the NTX host, or the use of 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 ACS NTX-200 series substation controllers as the master, or with another substation 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 modules with DNP 3.0 - opening up the system for easy expansion
- Dual Ethernet 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), GPS satellite clock, NTP or DNP3 protocol
- Easily expandable through the addition of ACS I/O modules to an NTX-series host controller, or through the use of 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 D20A. 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 A/D Converter. 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 D20A 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 D20S 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 D20K, and replaces both the WESDAC Control Logic Module and the WESTERM base panel. The NTX-U20/K provides a 16x16 isolated high-current optical driver matrix that replaces the WESDAC D20K 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. The NTX-U20/K supports assigning relay contact closure times in one-millisecond increments for each relay via DNP3.

All the original external D20KI series 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 D20C combination logic panel. It replaces the WESDAC D20C 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 D20C WESTERM termination panel for analog and digital input wiring connections, and a control relay cable for connection to external KI series momentary or latching interposing relay panels. The NTX-U20/C does not support analog outputs and pulse control (AGC). The NTX-U20/C supports assigning trip/close contact closure times in one-millisecond increments for each relay via DNP3.

## Control Adapter Module

For sites that have hand-wired, heavy-duty relay panels or other control interfaces, 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 K WESTERM base board, so all known external interposing relay installations can be accommodated beyond the basic KI relay modules.

## Replacement Termination Panels

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

- D20S (NTX-U20/DT)
- D20A (NTX-U20/AT)
- D20C (NTX-U20/CT)

These panels can be purchased together with our NTX-U20 I/O modules (in order to expand an existing D20 configuration), or separately (if needed to replace a failed WESTERM termination panel—ACS NTX-20 upgrade only).

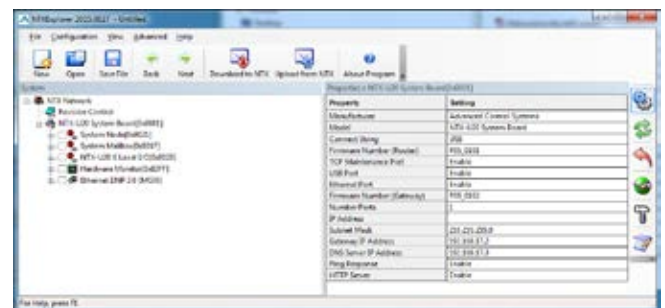


NTX-U20/C termination panel

## 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 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 eight IP clients, servers or multiples of both.

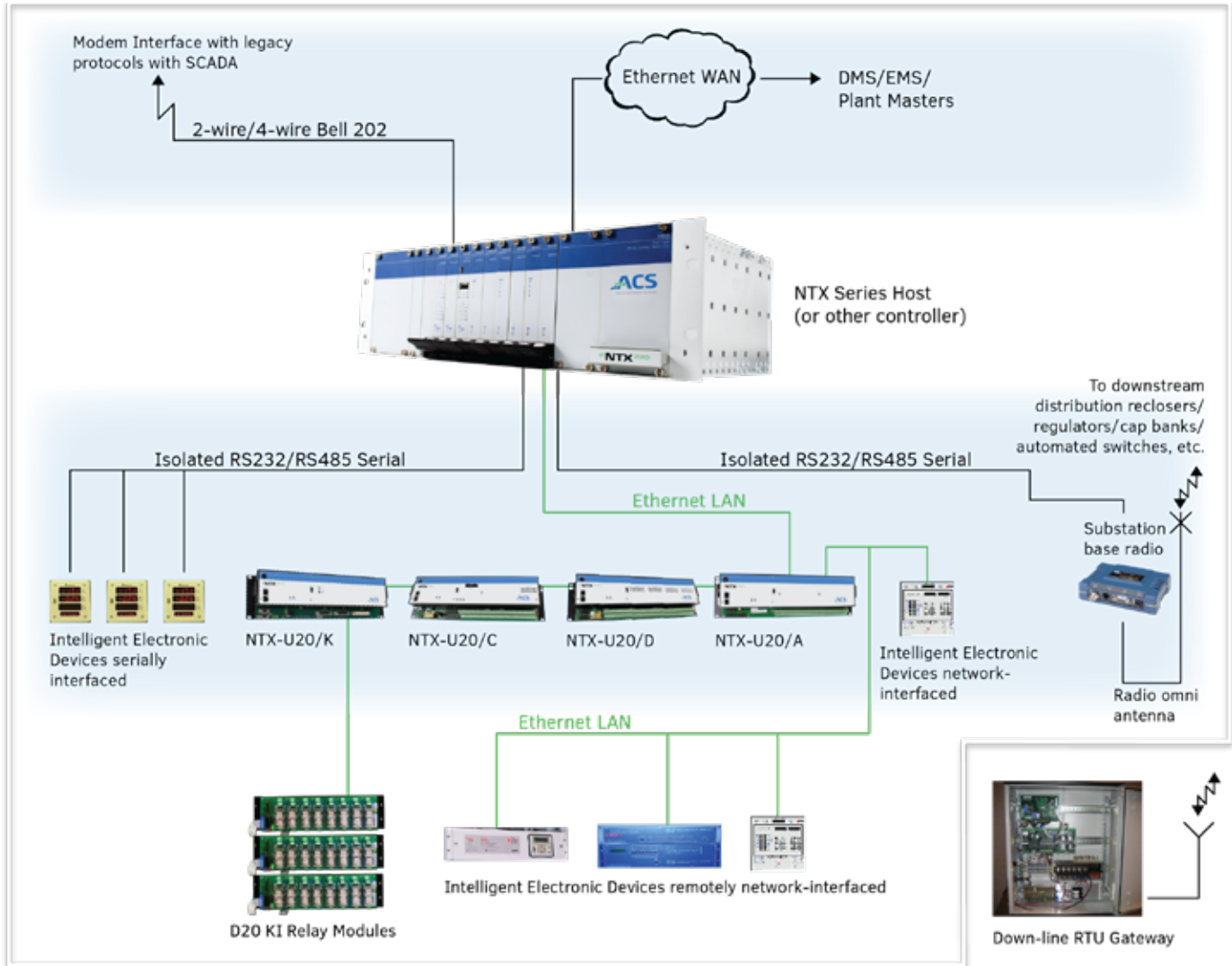
NTX Explorer (via the integrated Monitor feature) allows the user to view, in real-time, all the physical database values configured in each NTX-U20 I/O Controller and diagnose internal or external problems in the field. Locally-wired or IED I/O values may also be manually overridden for testing purposes and, with password permissions, control relays can be manually operated through the application.



NTX Explorer

# NTX-U20 Controller

## Example: upgrade architecture using NTX-U20



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