DOWNRANGE POWER & DATA DISTRIBUTION

For the UAC

Function: This section shall explain in general terms the basic design requirements for the UAC downrange power and data distribution required to control Next Generation Army Target System (NGATS) range targetry and its associated equipment.

UAC General Summary: Stations 1-4 shall be powered individually from a dedicated load center. Targetry for stations 1, 2, and 4 shall be provided without control network. The target emplacements in station 3 shall be "daisy-chained" or serially connected with the power and network data cables originating at the station observation platform control pedestal and continuing from emplacement to emplacement until they reach the façade. An optional shelter may be provided at installations with extreme climatic conditions at the observation platform control pedestal for protection of the target control pedestal. If communication cable distances between targetry and/or the station observation platform pedestal exceed 90m (295 feet), then fiber optical cable must be installed. Each station of the UAC shall have the capability to operate independently and concurrently. All target outlets shall have weatherproof covers and shall be weatherproof while the target is connected.

A network connection from the UAC to installation backbone is not required. A network connection between the Operations/Storage building and training stations is not required. Video collection is also not a requirement in the UAC.

Site Power Summary: Medium voltage primary power is run overhead from the line five feet outside of the Range Flagpole to a pad-mounted transformer located inside the Range Operations and Control Area near the Operations/Storage Building. 120/240V, single-phase power shall be fed underground from the pad-mounted transformer to the Operations/Storage power panel. The overhead primary power shall continue from the in-line riser pole to a dead-end riser pole near the first training station loadcenter. The primary power line shall continue underground to a pad-mounted transformer near the same training station loadcenter. The primary power line shall continue underground to pad-mounted transformers near the loadcenter for each of the remaining training stations. Where the site layout permits; the designer may elect to combine transformers to feed multiple training stations from one transformer. Each of stations 1-4 shall have a loadcenter, with integral transient voltage surge suppression, mounted on or near the training station location. The loadcenter shall feed the respective station targets with 120/240V. The size of the secondary power cables depends on the number of targets served, the circuit voltage drop, and the circuit protective device rating. Operating voltage at the most distant emplacement should be no less than 95 percent of the supplying transformer's secondary voltage. The observation platform in station 3 shall have a 120V maintenance receptacle.

Power Requirements: Electrical power distribution shall conform to the American Electrical Institute (AEI) and Technical Manual (TM) 5-811-1. Three-phase or single-phase primary power shall be extended to the range site depending on range load. Voltage regulation and/or metering may be required. The voltage supplied must be maintained within 5% at a frequency of 60Hz, +/-0.5; the design agency shall verify the power supply for each site.

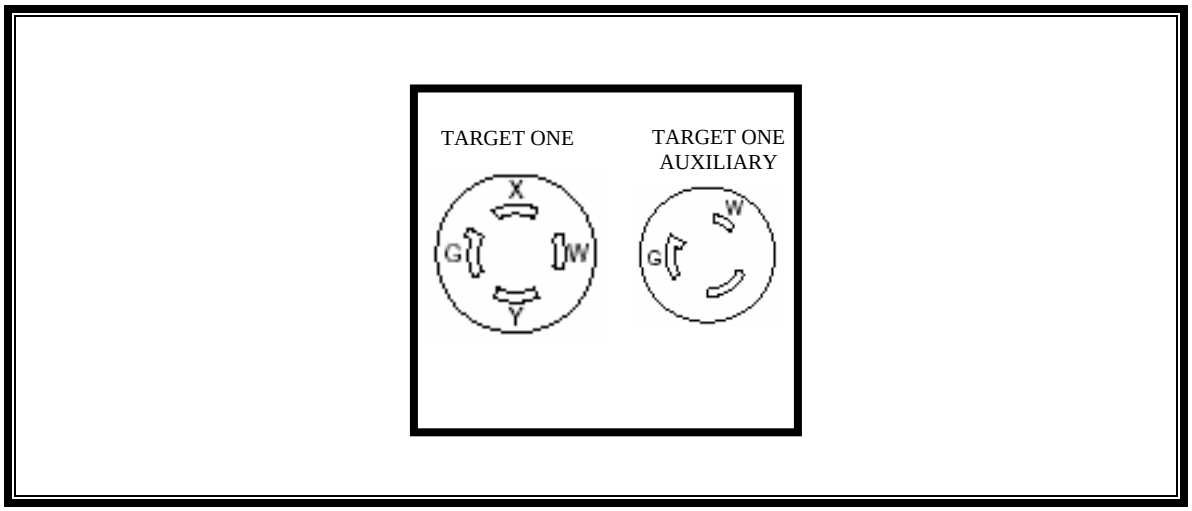
Data Summary: Training station 3 targets are controlled via an Ethernet-protocol-based network with Armor, Shielded Fiber, or standard Category 5e or better shielded twisted pair (STP). The type of cable required is dependant on the length of the data cable. The cable length criteria are provided in the Data Requirements table below. The target control cabling shall be installed underground in the same trench with the target power cable conduits. Provide surge protection for all copper data cables at each master target data panel (MTDP). This will require 4 surge protectors in the façade MTDP. All target outlets should have weatherproof covers and should be weatherproof while the target is connected. Data is not required on station 1, 2, and 4.

The Ethernet-protocol based network in station 3 is locally controlled through the observation control pedestal. The observation control pedestal is a NEMA 4 modular console system that houses the surge protectors for the data cables. The pedestal shall be a modular design consisting of a 26" high base unit, an 8" high plinth, and a hinged lid cover. The pedestal shall be provided with mounting rails for a 28 ½" high X 24" wide video screen and a data rail support kit that will allow for the installation of 19" mounting of electronic equipment. The lid and console door shall be provided with oil-resistant gaskets, shall be tamper resistant, and shall have locking latches. A 120V duplex outlet should be provided for electronic equipment installed by others in the pedestal. A ground lug should be provided in the pedestal with a connection back to the power ground. If fiber optic cables are required the fiber optic cables shall terminate on an SC style connector patch panel installed in the pedestal. The target installer will provide and install the network equipment and controlling equipment in this pedestal to control the targetry on station 3.

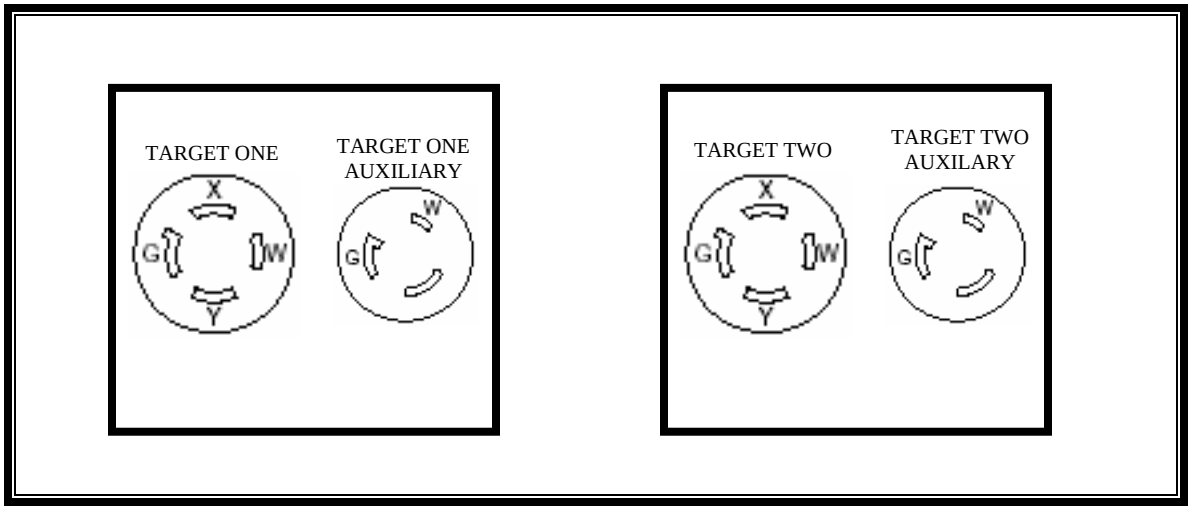
Data Requirements:

DISTANCES	MEDIUM	SPEED	BANDWIDTH	WAVELENGTH/ FREQUENCY
Over 90m	Singlemode Fiber Optic Cable	Minimum 10Mbps Maximum Unlimited	Unlimited	1310nm to 1550nm
90m & under	Category 5e or better Cable	Minimum 10Mbps	200Mhz	200Mhz

Targetry Interface Requirements:



Representative Single Target Outlet (Not to Scale)



Representative Double Target Outlet (Not to Scale)

TARGET POWER RECEPTACLE	AUXILIARY POWER RECEPTACLE	CAT 5E CABLE CONNECTORS	FIBER OPTIC CABLE CONNECTORS
NEMA L14-20R	NEMA L5-20R	RJ-45	Type “SC”

SIT Emplacement Target Interface Specifics

Representative Reactive and Non-Precision Targets

Representative Observation Platform Control Pedestal (Not to Scale)

Design Details: See the Layout Details for UAC stations and the Civil Details/Electrical Details for the SIT emplacement in the Appendix of this document.

Design Examples and Requirements:

Station #1-Individual and Team Trainer. See drawing layout for targetry and auxiliary power receptacles. All target outlets shall be mounted at a minimum 2134mm (7 ft) A.F.F. to the bottom of the outlet box. Conduits shall not be installed on the interior walls below 2134mm (7 ft) A.F.F. but are allowed to be placed on the

exterior walls if necessary. One 120-volt Ground Fault Circuit Interrupter (GFCI) maintenance receptacle shall be provided per training room with weatherproof covers. Data outlets are not required for targets on this station.

Station #2-Squad & Platoon Task-Technique. See drawing layout for targetry and auxiliary power receptacles. All target outlets shall be mounted at a minimum 2134mm (7 ft) A.F.F. to the bottom of the outlet box. Conduits shall not be installed on the interior building walls below 2134mm (7 ft) A.F.F., but are allowed on the exterior walls, excluding the center "alley" of the interior training building area. Two 120-volt Ground Fault Circuit Interrupter (GFCI) maintenance receptacles shall be provided per building and per floor with weatherproof covers. Data outlets are not required for targets on this station.

Station #3-Grenadier Gunnery. Target emplacements shall be "daisy-chained" or serially connected with the power and network data cables. The network cables shall originate from the observation platform control pedestal with a one meter service loop and continue from emplacement to emplacement until they reach the façade SIT emplacement NEMA 4 MTDP enclosure. The observation platform control pedestal shall require one duplex 120-volt outlet mounted inside the pedestal for use by the OPA-supplied electronic components. The power shall originate from the loadcenter in the observation platform control pedestal area. Two emplacements shall be dual target lifters in extra-wide emplacement pits. SIT emplacements require one duplex 120-volt receptacle in each MTDP or TDP for use by OPA. The façade requires a standard configuration SIT emplacement with MTDP and a loadcenter. Additional power and data outlets are required in the façade to control an additional 3 SIT lifters. See Façade Emplacement details for the complete power and data requirements in the façade.

Station #4-Offense/Defense. See drawing layout for targetry and auxiliary power receptacles. All target outlets shall be mounted at a minimum 2134mm (7 ft) A.F.F. to the bottom of the outlet box. Conduits shall not be installed on the interior building walls below 2134mm (7 ft) A.F.F., but are allowed on the exterior walls, excluding the center "alley" of the interior training building area. Two 120-volt Ground Fault Circuit Interrupter (GFCI) maintenance receptacles shall be provided per building and per floor with weatherproof covers. Data outlets are not required for targets on this station. Consult with local user requirements to determine the method of interior light switching. Lights will either be switched locally in each room with recessed mounted light switches or be all switched by a lighting contactor controlled by panic hardware installed at each building entrance.

Station #5-Underground Trainer. This station does not require instrumentation.