

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

TRICONEX

3603T

120 VDC DIGITAL OUTPUT

Used with the applicable Triconex safety system configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Tricon Technical Product Guide

TMR Digital Output Modules

Each TMR Digital Output (DO) module receives output signals from the Main Processors on each of three channels. Each set of three signals is then voted by special quadruplicated output circuitry on the module. The circuitry produces one voted output signal and passes it to the field termination. The quadruplicated voter circuitry provides multiple redundancy for all critical signal paths, guaranteeing safety and maximum availability.

Each TMR Digital Output Module has a voltage-loopback circuit which verifies the operation of each output switch independently of the presence of a load and determines whether latent faults

exist. Failure of the detected field voltage to match the commanded state of the output point activates the LOAD/FUSE alarm indicator.

In addition, ongoing diagnostics are performed on each channel and circuit of a TMR Digital Output Module. Failure of any diagnostic on any channel activates the Fault indicator, which in turn activates the chassis alarm signal. The Fault indicator merely indicates a channel fault, *not* a module failure. The module is guaranteed to operate properly in the presence of a single fault and may continue to operate properly with certain kinds of multiple faults.

All TMR Digital Output Modules support hot-spare capability, and require a separate external termination panel (ETP) with a cable interface to the Tricon controller backplane. Each module is mechanically keyed to prevent improper installation in a configured chassis.

Digital outputs are designed to source the current to field devices, so field power must be wired to each output point on the field termination.

16-Point Digital Output Module Specifications

Model Number	3601E/3601T	3603B/3603E/3603T	3607E	3604E
Nominal Voltage	115 VAC	120 VDC	48 VDC	24 VDC
Type	TMR, DO	TMR, DO	TMR, DO	TMR, DO
Output Signals	16, non-commoned	16, commoned (3603E/T) 16, non-commoned (3603B)	16, non-commoned	16, non-commoned
Voltage Range	80-155 VAC	90-150 VDC	44-80 VDC	22-45 VDC
Voltage Drop ^a	< 3V, typical	< 1.5V, typical	< 3V, typical	< 4V, typical
Frequency Range	47-63 Hz	n/a	n/a	n/a
Current Ratings, Maximum	2A per point 12A surge/cycle	0.8A per point 4A surge/10 ms	1A per point 5A surge/10 ms	2A per point 10A surge/10 ms
Load Leakage	2 mA maximum @ 60 Hz	2 mA maximum	2 mA maximum	2 mA maximum
Chassis Leakage	4 mA maximum @ 60 Hz	n/a	n/a	n/a
Fuses (on Field Termination)	1 per output, 3A fast-acting	1 per output, 1.0A fast-acting	1 per output, 1.25A fast-acting	1 per output, 2.5A fast-acting
Point Isolation	1,500 VDC/ 2500 VDC ^b	1,500 VDC/ 2500 VDC ^c	1,500 VDC	1,500 VDC
Diagnostic Indicators				
On or Off state	1 per point	1 per point	1 per point	1 per point
Module Status	PASS, FAULT, ACTIVE	PASS, FAULT, ACTIVE	PASS, FAULT, ACTIVE	PASS, FAULT, ACTIVE
Field Alarm	LOAD/FUSE	LOAD/FUSE	LOAD/FUSE	LOAD/FUSE
Color Code	Green	Blue	Light blue	Dark blue

a. **WARNING:** The voltage drop may be significantly higher in some applications.

b. For 3601T.

c. For 3603T.

dule number in the first column with termination options on the right. An I/O module can be wired to a maximum of two termination
 be of two different types—for example, commoned and non-commoned.

scription	Commoned Term Panels	Non-Common. Term Panels	Basic Term Panels	Nonincendive Term Panels	RG 1.180 Term Panels	Fanned-out Cables	Bypass Panels	ERT Loop- Back Cables/Panels
/VDC, 32 pts.	9561-810F	9561-110F	9551-110F	n/a	n/a	9101-010F	n/a	9141-010F
VDC, 32 pts.	9562-810F	n/a	9552-610F	n/a	n/a	9101-010F	n/a	9142-010F
VDC, 32 pts.	9563-810F 9563-910F	n/a	9553-610F	9572-610F	n/a	9101-010F	BP9228-010F	9143-010F
XC, 64 pts.	9566-810F, 24V 9565-810F, 48V	n/a	9750-310F, 24V 9750-410F, 48V	9570-610F, 24V n/a	n/a	n/a	BP9229-010F n/a	n/a
low threshold,	9563-810F 9563-910F	n/a	9553-610F	9572-610F	n/a	9101-010F	BP9228-010F	9143-010F
Hz, 8 pts.	n/a	n/a	9753-110F	n/a	n/a	n/a	n/a	n/a
Hz, 8 pts.	n/a	n/a	9753-110F	9793-110F	9794-110F	n/a	n/a	n/a
π, 24 VDC,	n/a	n/a	9753-110F	9572-610F	n/a	n/a	n/a	n/a
single, 64 pts.	9566-710F	n/a	9553-610F	9571-610F	n/a	9101-010F	n/a	n/a
7, 16 pts.	9661-610F 9663-610F	9661-110F 9664-110F	9651-110F	n/a	n/a	9101-010F	n/a	9670-110F 9670-610F
7, 16 pts.	9663-610F	9664-110F	n/a	n/a	n/a	n/a	n/a	n/a
C, 16 pts.	n/a	9251-210	n/a	n/a	n/a	n/a	n/a	n/a
C, 16 pts.	9661-910F ^a 9664-810F ^a	n/a	9651-110F	n/a	n/a	9101-010F	n/a	9673-810F ^a
C, 16 pts.	9664-810F ^a	n/a	n/a	n/a	n/a	n/a	n/a	9673-810F ^a
1, 16 pts.	9662-810F	9662-110F	9653-610F	9671-610F	n/a	9101-010F	n/a	9671-810F
1, 16 pts.	9667-810F	9667-110F	9652-610F	n/a	n/a	9101-010F	n/a	9672-810F
7, 8 pts.	9661-510F	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C, 8 pts.	9661-810F	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1, 8 pts.	9662-810F	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1, low power,	9662-710F	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1, 8 pts.	9667-910F	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C, 16 pts.	9661-910F	n/a	9651-110F	n/a	n/a	9101-010F	n/a	n/a
C, 16 pts.	9664-810F	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1, self-protected,	9662-610F	n/a	9653-610F	9671-610F	n/a	9101-010F	n/a	n/a
1, self-protected,	9662-610F	n/a	9653-610F	9671-610F	n/a	9101-010F	n/a	9671-810F ^b
ed), 32 pts.	n/a	9668-110F	9651-110F	n/a	n/a	9101-010F	n/a	n/a
VDC, self-protected,	9662-610F	n/a	9653-610F	9671-610F	n/a	9101-010F	n/a	9671-810F ^b

Part Number Cross-Reference

The table below identifies the external termination assembly (ETA) part number and the cable part number for each termination panel model number.

There are four cable types included in this table:

- **FT4:** Ninety-degree cables that meet FT4 flame test ratings. Add “F” at the end of the base model number to obtain the complete model number. For example, 9551-110F.
- **Z:** Zero-degree cables, designed to be used with G-Series Enclosures for Tricon systems that have front access. Add “F-Z” at the end of the base model number to obtain the complete model number. For example, 9551-110F-Z.
- **LSZH:** Low Smoke Zero Halogen ninety-degree cables. Add “J” at the end of the base model number to obtain the complete model number. For example, 9551-110J.
- **FT1:** Ninety-degree cables that were shipped with pre-FT4 ETP models. These models did not include a letter at the end of the base model number.

Part Number Cross-Reference—ETPs

Base Model #	ETA	FT4 Cable	Z Cable	LSZH Cable	FT1 Cable (Old)
9551-110	3000400-160	4000187-110	4000192-110	4000140-110	4000093-110
9552-610	3000400-260	4000187-210	4000192-210	4000140-210	4000093-210
9553-610	3000400-360	4000187-310	4000192-310	4000140-310	4000093-310
9561-110	3000560-110	4000187-110	4000192-110	4000140-110	4000093-110
9561-810	3000510-180	4000187-110	4000192-110	4000140-110	4000093-110
9562-810	3000510-280	4000187-210	4000192-210	4000140-210	4000093-210
9563-810	3000510-380	4000187-310	4000192-310	4000140-310	4000093-310
9563-910	3000510-390	4000187-310	4000192-310	4000140-310	4000093-310
9565-810	3000540-280	4000187-210	4000192-210	4000140-210	4000093-210
9566-710	3000530-380	4000187-310	4000192-310	4000140-310	4000093-310
9566-810	3000540-380	4000187-310	4000192-310	4000140-310	4000093-310
9570-610	3000768-370	4000195-310	4000199-310	n/a	4000165-310
9571-610	3000768-390	4000195-310	4000199-310	n/a	4000165-310
9572-610	3000771-380	4000195-310	4000199-310	n/a	4000165-310
9651-110	3000410-160	4000188-110	4000193-110	4000141-110	4000094-110
9652-610	3000410-260	4000188-210	4000193-210	4000141-210	4000094-210
9653-610	3000410-360	4000188-310	4000193-310	4000141-310	4000094-310
9661-110	3000570-110	4000188-110	4000193-110	4000141-110	4000094-110
9661-510	3000550-160	4000188-110	4000193-110	4000141-110	4000094-110