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## GENERAL

### Safety Instructions

- When performing any work (installation, mounting, start-up), all instructions given by the manufacturer and in particular the safety instructions provided in these Installation Instructions are to be observed.
- The TIGER may be installed and mounted only by authorized and trained personnel.
- If the unit is modified in any way, except by the manufacturer, all warranties concerning operation and safety are invalidated.
- Make sure that applicable local standards and regulations are observed at all times. Examples of such regulations are VDE 0800 and VDE 0100.
- Use only accessory equipment coming from or approved by CentraLine.
- Before the system is dismantled, disconnect the power supply. Do this by removing terminal block A or by installing an additional 3<sup>rd</sup>-party switch onto the DIN rail close to the controller; see the following caution and note.

### CAUTION

Disconnect the power supply before you start to install the TIGER. Do not reconnect the power supply until you have completed installation.

#### IMPORTANT

*To comply with CE requirements, devices with a voltage in the range of 50 to 1000 Vac or 75 to 1500 Vdc which are not provided with a supply cord and a plug or with other means for disconnection from the supply having a contact separation of at least 3 mm in all poles, must have the means for disconnection incorporated in the fixed wiring.*

## APPLICATION

The TIGER is suitable for numerous applications, including:

- heating
- air handling units
- supermarket refrigeration applications
- 2- to 48-stage chiller units
- 2- to 4-stage roof top heat pump units

The TIGER is designed primarily for stand-alone applications (in conjunction with a maximum of one CLTG38EXP01 Expansion Board).

However, in the event that the TIGER is to be employed in conjunction with other controllers (i.e. in networks), communication is effected only via LONWORKS.

The TIGER uses standard SNVT types; thus, it can be integrated into any LONMARK system, including those making use of 3<sup>rd</sup>-party devices.

## BASIC FEATURES

Both TIGER controller versions and the CLTG38EXP01 expansion board are equipped with analog inputs (AI's), analog outputs (AO's), digital inputs (DI's) and digital outputs (DO's). The DO's include changeover relays (CO's) and normally-open relays (NO's). See Table 1.

**Table 1. Hardware components of the TIGER**

version	AI's	AO's	DI's	DO's	
				CO's	NO's
CLTG38L01	8	4	14	3	9
CLTG38L11	8	4	14	3	9
CLTG38EXP01	8	4	14	3	9

### CLTG38EXP01 Expansion Board

The CLTG38EXP01 is suitable for mounting on in an electrical cabinet (either on the DIN rail or the wall).

Both TIGER controller versions can be connected to a maximum of one CLTG38EXP01 expansion board.

In the case of side-by-side or vertical installation, the CLTG38EXP01 is connected using a 350-mm cable (included in the CLTG38EXP01 delivery).

## Optional Accessories

### CLTG00MMIN01 External MMI

The TIGER controller family also includes the CLTG00MMIN01 External MMI, a cabinet-mountable Man-Machine-Interface which can be attached (only) to the CLTG38L01:



**Fig. 1. CLTG00MMIN01 External MMI**

**NOTE:** The CLTG00MMIN01 comes with the following two accessories:  
cabinet door mounting kit,  
1.5-m-long flat-strip connection cable.

### CLMMI00N22

The CLMMI00N22 can be connected to the B-port of the CLTG38L01 or CLTG38L11.

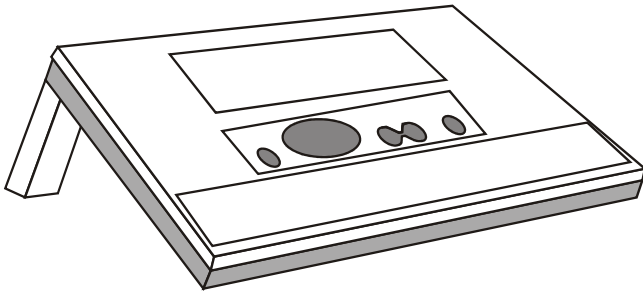


Fig. 2. CLMMI00N22

**NOTE:** The CLMMI00N22 comes with the following accessory: 5-m-long connection cable XW582.

The CLMMI00N22 features an MMI and can display special character sets (e.g. Cyrillic, etc.).

## Housings

The housings of both TIGER controller versions and of the CLTG38EXPN01 expansion board have the same dimensions (see Fig. 9 on page 8).

## LonWorks Module

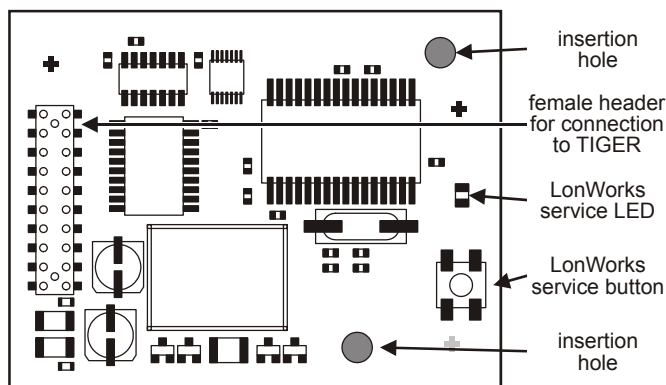


Fig. 3. The LonWorks Module

To enable LONWORKS communications (thus permitting operation in any LONWORKS environment, including those containing Centraline and/or 3<sup>rd</sup> party LONMARK equipment), TIGER controllers are equipped with the LONWORKS Module.

The LONWORKS Module is a pluggable LONWORKS interface in the form of a static-sensitive bare board piggyback module. It includes an FTT-10A Free Topology Twisted Pair Transceiver allowing communication with other devices on a LONWORKS network. FTT-10A transceivers communicate at 78 Kbaud and provide transformer isolation so that the bus wiring does not have a polarity; that is, it is not important which of the two bus terminals are connected to each wire of the twisted pair.

## Terminal Blocks

The colors of the various terminal blocks are listed in Table 2.

Table 2. Colors of terminal blocks

terminal block for:	color:
analog inputs (AI's)	green
digital inputs (DI's)	
analog outputs (AO's)	
digital outputs (DO's)	orange (230 V)
LONWORKS Module	brown
power supply	brown

## Low-Voltage Terminal Block

Both TIGER controller versions and the CLTG38EXPN01 expansion board feature a low-voltage double-decker terminal block equipped with a total of 30 screw-type analog input, digital input, and analog output terminals (see Fig. 4).

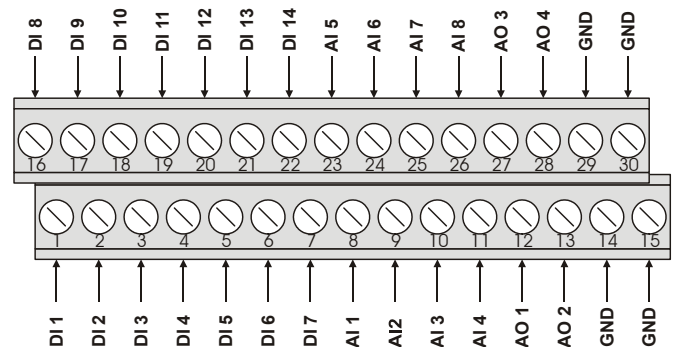


Fig. 4. Terminal block for AI's, DI's, and AO's

This terminal block is located on the left side of the front of the housing (see also Fig. 9 on page 8). In the event you need to repair or replace the controller, the terminal block connector can be unplugged from the terminal block, thus preserving the wiring configuration.

For performance data, see also section "Analog Input Ratings" on page 3, section "Digital Input Ratings" on page 4, and section "Analog Output Ratings" on page 4.

## Analog Input Ratings

Both TIGER controller versions and the CLTG38EXPN01 expansion board feature analog inputs as listed in Table 3.

Table 3. Number of AI's and terminals (by version)

version	no. of AI's	no. of terminals
CLTG38L01	8	9
CLTG38L11	8	9
CLTG38EXPN01	8	9

Each analog input is switchable by software to the input conditions listed in Table 4.

Table 4. Input conditions for switching analog inputs

NTC (20k $\Omega$ ) / 0...10 V (low impedance)	-50...+150°C
0...20 mA (external 500 $\Omega$ resistor)	0...+10 V
slow digital inputs	dry contact

These analog inputs have an FIO (Field Input Output) cycle time of 1 second. Special application features ensure that the

critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

When equipped with an external 500  $\Omega$  resistor, the analog inputs can also be used to provide 0...20 mA current input.

The analog inputs are protected against short-circuiting and over-voltage 24 Vac.

If any analog input is sourced with more than 20 Vdc or with negative voltage, the other analog inputs may provide disturbed values.

The input impedances are defined as followed:

- Input impedance (NTC / 0...10 V): 200k $\Omega$  to GND / 25k $\Omega$  to +10 V.
- Max. ratings (voltage): +20 V / -1 V.
- Not electrically isolated.
- Resolution: 10 bit.

Table 5 and Table 6 provide information on the resolution of analog input sensors and on their accuracy, respectively.

- Accuracy of analog input voltage: 0...10 V /  $\pm 200$  mV.
- Accuracy of analog input current: 0...20 mA /  $\pm 1$  mA (when equipped with external 500  $\Omega$  resistor).
- Sample time: 1 s.

**Table 5. Resolution of AI sensors**

range	resolution/step of A/D-converter (approx.)
-50...-20 °C	$\pm 1.0$ K
-20...0 °C	$\pm 0.2$ K
0...30 °C	$\pm 0.1$ K
30...70 °C	$\pm 0.3$ K
70...100 °C	$\pm 0.8$ K
100...130 °C	$\pm 2.0$ K
130...150 °C	$\pm 3.5$ K

**Table 6. Accuracy / deviation of AI sensors**

range	deviation ( $\pm$ Kelvin, not including sensor tolerance)	
	hardware-specific deviation	software-specific deviation
-50...-40 °C	$\pm 7.5$ K	$\pm 0.5$ K
-40...-30 °C	$\pm 4.0$ K	$\pm 0.4$ K
-30...-20 °C	$\pm 2.5$ K	$\pm 0.2$ K
-20...-10 °C	$\pm 1.5$ K	$\pm 0.1$ K
-10...0 °C	$\pm 1.0$ K	$\pm 0.1$ K
0...10 °C	$\pm 0.7$ K	$\pm 0.05$ K
10...50 °C	$\pm 0.5$ K	$\pm 0.05$ K
50...70 °C	$\pm 0.8$ K	$\pm 0.05$ K
70...90 °C	$\pm 1.3$ K	$\pm 0.1$ K
90...100 °C	$\pm 1.8$ K	$\pm 0.1$ K
100...120 °C	$\pm 3.4$ K	$\pm 0.3$ K
120...150 °C	$\pm 8.5$ K	$\pm 0.5$ K
ambient temperature = 25 °C		

## Digital Input Ratings

Both TIGER controller versions and the CLTG38EXP01 expansion board feature numerous digital inputs as listed in Table 7.

**Table 7. Number of DI's and terminals (by version)**

version	no. of DI's	no. of terminals
CLTG38L01	14	15
CLTG38L11	14	15
CLTG38EXP01	14	15

These digital inputs have an FIO (Field Input Output) cycle time of  $\leq 250$  msec. Special application features ensure that the critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

- Not electrically isolated.
- 24 Vac via dry contact. The TIGER supplies no special auxiliary voltage.
- Can be used only as status inputs, as alarms, or as slow totalizers.

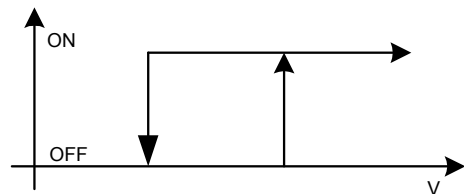
Pulse times are specified in Table 8.

**Table 8. Pulse times of digital inputs**

kind of signal	special requirements	pulse time	pulse pause
potential-free (dry) contact	must be able to switch low voltages, max. bouncing time: 50 msec	$\geq 300$ msec	$\geq 300$ msec
AC voltage	none	$\geq 300$ msec	$\geq 300$ msec

The DC voltage switching thresholds of the digital inputs are:

- ON: 4.7...7.7 Vdc
- OFF: switching ON level -0.8...-3 Vdc (i.e. there is a hysteresis of between 0.8 and 3 V to switch back to OFF)



**Fig. 5. DC voltage switching thresholds of digital inputs**

- The minimum AC voltage switching threshold of the digital inputs is: 24 Vac -20%.
- Sample time: 250 msec.

## Analog Output Ratings

Both TIGER controller versions and the CLTG38EXP01 expansion board feature four analog outputs as listed in Table 9.

**Table 9. Number of AO's and terminals (by version)**

version	no. of AO's	no. of terminals
CLTG38L01	4	5
CLTG38L11	4	5
CLTG38EXPN01	4	5

These analog outputs have an FIO (Field Input Output) cycle time of 1 second. Special application features ensure that the critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

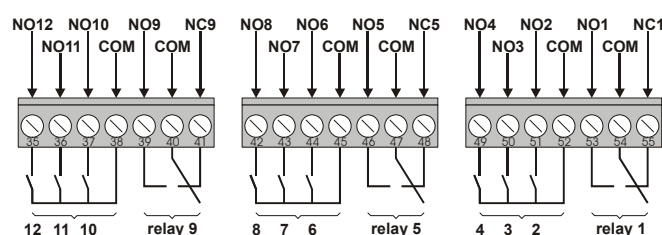
- Output voltage: 0...10 V (max. 11 V) or 2...10 V.
- Not electrically isolated.
- Max. output current (sink/source): -0.5 mA / +1 mA.
- Resolution: 8 bit.
- Accuracy:  $\pm 150$  mV +  $\pm 1$  LSB (Least Significant Bit)
- Zero-point:  $\pm 150$  mV +  $\pm 1$  LSB.
- Min. voltage step (LSB): 0.043 V.

The outputs are protected against over-voltage up to 24 Vac.

- Reset / watchdog position: 0%.
- Refresh cycle: 1 second.

### Digital Output Terminal Blocks

Both TIGER controller versions and the CLTG38EXPN01 expansion board feature two digital output terminal blocks, each equipped with seven screw-type terminals (see Fig. 6).

**Fig. 6. Terminal blocks for digital outputs**

These terminal blocks are located at the rear of the housing (see also Fig. 9 on page 8). In the event you need to open, repair, or replace the controller, the terminal block connectors can be unplugged from the terminal blocks, thus preserving the wiring configuration.

The seven terminals of each terminal block provide:

- one CO (changeover relay) and
- three NO's (normally-open relays).

Each digital output terminal block may be connected either to 24 Vac or 230 Vac.

**NOTE:** It is not allowed to mix 24 Vac or 230 Vac voltages on one and the same digital output terminal block.

For performance data, see also section "Digital Output Ratings" on page 5.

### Digital Output Ratings

Both TIGER controller versions and the CLTG38EXPN01 expansion board feature digital outputs – functioning as changeover relays (CO's) and normally-open relays (NO's) – as listed in Table 10.

**Table 10. Number of DO's and terminals (by version)**

version	no. of DO's		no. of terminals
	CO's	NO's	
CLTG38L01	3	9	21
CLTG38L11	3	9	21
CLTG38EXPN01	3	9	21

These digital outputs have an FIO (Field Input Output) cycle time of  $\leq 250$  msec. Special application features ensure that the critical control tasks (expansion valve control or special alarm functions) do not exceed a cycle time of 500 msec.

- Output stage: relays (one CO per terminal block).
- Power failure position: inactive.
- Reset / watchdog position: inactive.
- Max. voltage: 230 Vac. The digital output terminals can switch 24 or 230 Vac or Vdc.

## CAUTION

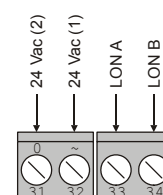
It is not allowed to mix the voltages on one and the same digital output terminal block!

- Max. switch frequency:  $< 2$  Hz.
- Min. ON/OFF time  $\geq 250$  msec.
- Output strength: 2 A / 230 Vac ( $\cos \phi = 1.0$ ).
- Total device (TIGER): max. 12 A.
- Lifetime (electrical): 500000 cycles (2 A), the unit lifetime (as measured in the no. of switching cycles) increases when current  $< 2$  A.
- Lifetime (mechanical):  $30 \times 10^6$  cycles.

### LonWorks Terminal Block

Both TIGER controller versions feature a LONWORKS terminal block equipped with two terminals for connection of the controller to a LONWORKS network (see Fig. 7).

To enable LONWORKS communications and thus to integrate the controllers in such networks, the TIGER controllers are equipped with the LONWORKS Module (see also "LonWorks Module" on page 3).

**Fig. 7. Power supply terminal block and LonWorks terminal block**

This LONWORKS terminal block is located on the right side of the front of the housing (see also Fig. 9 on page 8).

### Power Supply Terminal Block

Both TIGER controller versions feature a power supply terminal block equipped with two terminals for connection of the controller to the power supply (see Fig. 7).

This power supply terminal block is located on the right side of the front of the housing (see also Fig. 9 on page 8).

**Voltage Supply**

- 24 Vac  $\pm 20\%$ , 49...61 Hz or
- 24 Vdc  $+20\%$ ,  $-10\%$

**B-Port**

Both TIGER controller versions feature a B-Port for connection to a standard null modem cable with a female 9-pin connector.

The B-Port (an RS232 serial interface) is a 9-pin male sub-D terminal. The B-Port is located near the middle of the front of the housing (see also Fig. 9 on page 8).

The B-Port can be used for uploading and/or downloading an application using CARE and/or XL-Online.

The B-Port has a default communication speed of 9.6 Kbaud by default but can be set as high as 38.4 Kbaud.

**Table 11. Signals of serial port**

signal type	controller output	controller input
signal ground		
transmit	x	
receive		x
carrier detect		x
clear to send		x
data terminal ready	x	
5 V	x	

**LONWORKS Service LED and Button**

Both TIGER controller versions are equipped with an LonWorks Module (see section "LonWorks Module" on page 3). The LONWORKS service LED and corresponding LONWORKS service button are located on the right side of the housing cover (see also Fig. 9 on page 8).

The LONWORKS service LED is used to diagnose the state of the TIGER. In general:

- If the LED is lit continuously, the controller is applicationless.
- If the LED is flashing, the controller has an application but is not configured.

Pushing the LONWORKS service button will initiate a re-commissioning of the TIGER.

A more detailed diagnosis can be carried out by observing the duration of the ON and OFF states of the service LED in conjunction with power ON / OFF. Fig. 8 illustrates the different service LED behaviors. These are the most common behaviors, but since the state of the service LED is under firmware control and can be affected both by hardware and software anomalies, other forms of behavior are also possible.

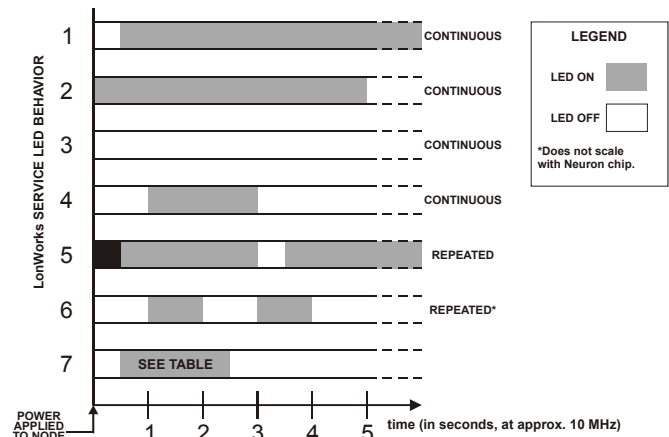
**Fig. 8. LONWORKS Service LED behavior**

Table 12 describes these behaviors in different contexts. Again, this list is not exhaustive and therefore does not provide explanations for every possible service LED behavior.

**Table 12. LONWORKS Service LED behavior descriptions**

behavior	context	likely explanation
1	Anytime	The controller is configured and running normally.
2	Power-up of the node	Bad node hardware.
3	Power-up of the node	Bad node hardware.
4	Power-up / reset of the node	The controller is applicationless. May be caused by the Neuron chip firmware when a mismatch occurs on application checksums. This behavior is normal if the application was exported to come up <i>applicationless</i> .
5	Anytime	Possible corrupt EEPROM. For a Neuron 3150 Chip-based node, use a newly programmed PROM, or EEBLANK and follow bring-up procedure.
6	Anytime	The controller is unconfigured.
7	First power-up, <i>applicationless</i> firmware state exported	The OFF duration is approx. 1 second. Service LED should then turn ON and stay ON, indicating an applicationless state.
7	First power-up, <i>unconfigured</i> firmware state exported	The OFF duration is 1...15 seconds depending on the application size and system clock. Service LED should then begin flashing as in behavior 5, indicating an unconfigured state.
7	First power-up, <i>configured</i> firmware state exported	The OFF duration is indefinite (1...15 sec to load internal EEPROM; stays OFF, indicating configured state). The controller is configured and running normally.

## MOUNTING AND ORIENTATION

Both TIGER controller versions and the CLTG38EXP01 expansion board are suitable for mounting in electrical cabinets (either on the DIN rail or the wall).

The CLTG00MMIN01 External MMI is suitable for mounting in cabinet doors.

### Field Wiring

The terminals for digital inputs, analog inputs, and analog outputs are grouped together in a single terminal block.

The same transformer which supplies the TIGER can also be used to supply additional controllers and/or active sensors / active actuators.

### Serviceability/Field Repair

There are no service or field repair parts inside the TIGER. Repair only at Centraline. Firmware / application upgrade can be done via download.

### Field Adjustments

Both TIGER controller versions are equipped with a potentiometer for adjusting the contrast of the display of the built-in MMI or of the CLTG00MMIN01 External MMI. To access this potentiometer, the controller's housing must be opened (see section "Opening the Housing").

### Opening the Housing

In order to open the TIGER cover, the two (or three) digital output terminal block connectors located at the rear of the housing must first be unplugged.

## Performance

### Operational Characteristics

Both TIGER controller versions feature the following:

- 1 EPROM: Boot EPROM 64 Kbyte
- 2 FLASH memories: each 512 Kbyte
- 2 x RAM , each 128 Kbyte
- interfaces: B-Port (RS232-interface) for MMI, PC, or modem
- special features: Real-time clock (buffered by gold capacitor), "watchdog" logic

### Operational Environment

Both TIGER controller versions and the CLTG38EXP01 expansion board are suitable for operation/storage under the following environmental conditions:

Ambient operating temperature: 0...+50 °C;

Ambient storage temperature: -20...+85 °C

Humidity: 5...95% (non-condensing)

RFI, EMI: According to CE regulations

Protection Class: IP 20 for both TIGER controllers and the CLTG38EXP01 Expansion Board

The CLTG00MMIN01 External MMI has a protection class of IP 54 only when it is installed on the cabinet door using the rubber seal included in the mounting kit.

Memory and real-time clock: Buffered for 72 h while power off at 25 °C.

Lifetime of FLASH memory for application firmware: 10 years

Dimensions

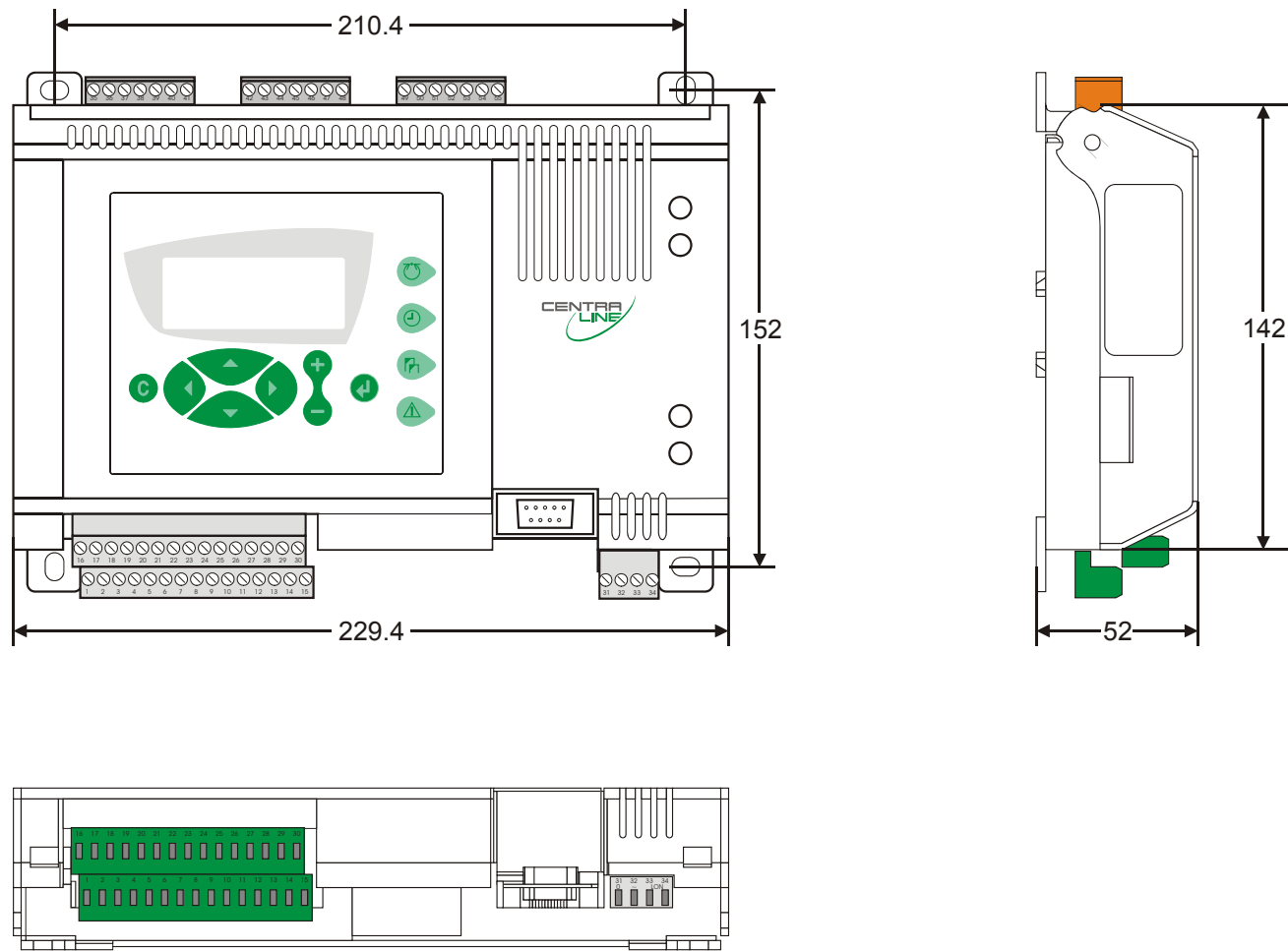


Fig. 9. Dimensions (in mm) and main hardware features of the two TIGER controllers



## CONNECTIVITY

### MMI Connection

For direct communication, the CLTG00MMIN01 External MMI or XL-Online can be connected to the CLTG38L01. This is effected via the controller's B-Port.

When the cable from the CLTG00MMIN01 External MMI or XL-Online is plugged in during normal operation of the CLTG38L11 (with built-in MMI), the controller's MMI is temporarily disabled. After unplugging the external MMI, it takes up to 15 seconds until the local MMI activates again.

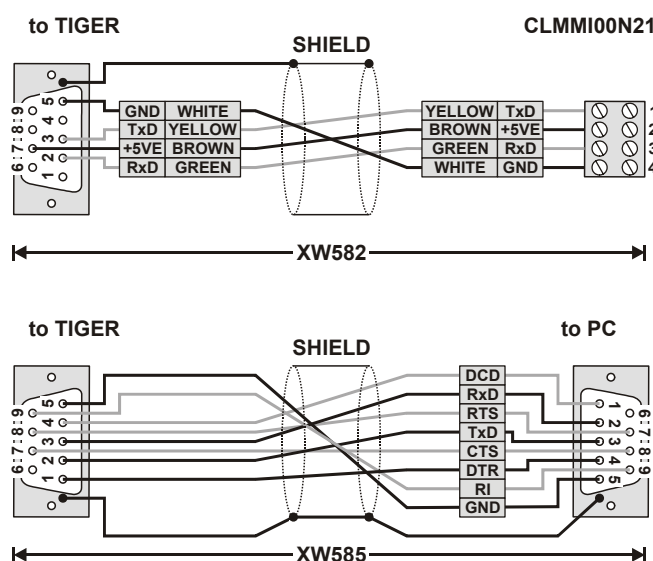
### Cable Specifications

Ready-made cables with the shield already connected to the computer module plug end are available for the connection of external MMIs.

**Table 13. Cable specifications**

MMI type	cable	length
CLTG00MMIN01	XW582	1.5 m
XL-Online	XW585	5 m

For connection to a PC, a standard null modem cable may be used.



**Fig. 10. MMI cable details**

## LONWORKS CAPABILITIES

The TIGER controllers are LONMARK compatible and are capable of communicating with devices on a LONWORKS network.

LONWORKS devices can be wired in daisy chain, star, loop or any combination thereof as long as the maximum wire length requirements given below are met. The recommended configuration is a daisy chain with two bus terminations. This layout has a simple structure presenting the least number of possible problems, particularly when adding on to an existing bus.

**NOTE:** A doubly-terminated bus may have stubs of up to 3 m from the bus to each node.

**Table 14. Doubly-terminated bus specifications**

cable type	max. bus length
Belden 85102	2,700 m
Belden 8471	2,700 m
Level IV, 22 AWG	1,400 m
JY (St) Y 2x2x0.8	900 m
TIA568A Categ. 5 24AWG, twisted pair	900 m

The cable types listed above are as recommended by Echelon in their FTT-10A User Guide. The cable recommended by Honeywell is the level IV, 22 AWG, solid core, non-shielded cable. Belden part numbers are 9H2201504 (plenum) and 9D220150 (non-plenum).

The FTT specification includes two components that must be met for proper system operation. The distance from each transceiver to all other transceivers and to the termination must not exceed the *maximum node-to-node distance*. If multiple paths exist, the *maximum total wire length* is the total amount of wire used.

**Table 15. Free topology (singly-terminated) specifications**

cable type	max. node-to-node distance	max. total wire length
Belden 85102	500 m	500 m
Belden 8471	400 m	500 m
Level IV, 22AWG	400 m	500 m
JY (St) Y 2x2x0.8	320 m	500 m
TIA568A Category 5 24AWG, twisted pair	250 m	450 m

### IMPORTANT

*Do not use different wire types or gauges on the same LONWORKS network segment. The step change in line impedance characteristics would cause unpredictable reflections on the network.*

**NOTE:** In the event that the limit on the total wire length is exceeded, FTT physical layer repeaters (FTT 10A) can be added to interconnect segments and increase the overall length by an amount equal to the original specification for that cable type and bus type for each repeater used. For example, adding repeaters for a doubly-terminated bus using JY (St) Y 2x2x0.8 cable increases the maximum length 900 m for each repeater.

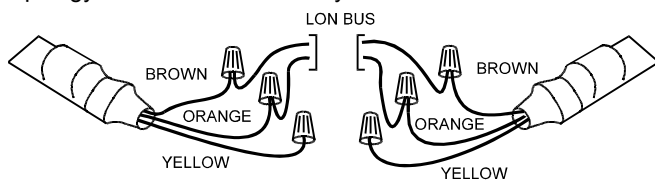
## LONWORKS Bus Termination

One or two LONWORKS terminations are required, depending on the given LonWorks bus layout.

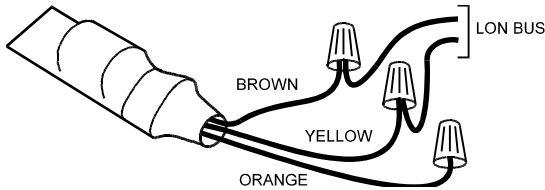
Two different LONWORKS terminations are available:

- the LONWORKS termination module (order no.: 209541B) (see Fig. 11 and Fig. 12) and
- the LONWORKS connection / termination module (order no.: XAL-Term), which can be mounted on DIN rails and in fuse boxes) (see Fig. 13).

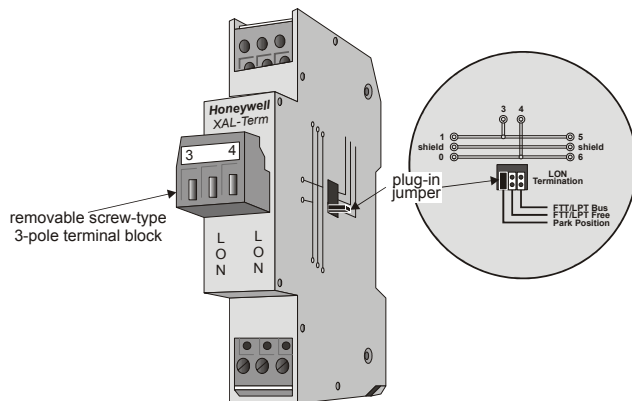
The maximum lengths listed in Table 14 and Table 15 must be adhered to when creating either a daisy chain or a free-topology LONWORKS network layout.



**Fig. 11. Termination Module connections for doubly-terminated FTT network**



**Fig. 12. Termination Module connections for a singly-terminated FTT network**



**Fig. 13. LonWorks connection and termination module**

## Firmware

The firmware supports the performance of the I/O mix as specified in section "Terminal Blocks" on page 3:

- 1 sec scan time for analog inputs and analog outputs
- 250 msec for digital inputs and digital outputs

## Assignment and Commissioning

The TIGER controllers must be assigned and commissioned using CARE 4.00.00 or higher.

LONWORKS: XIF file generation and bindings must be done using CARE 4.00.00 or higher.

Thus, the programmer must assign TIGER controllers as though they were XL500 controllers and must assign the correct technical addresses. The programmer must manually assign the number of inputs/outputs and the board numbers, and special attention must be made when assigning the inputs/outputs to the internal boards that the actual number of I/O's is not exceeded.

To assign the technical addresses to the LONWORKS network variables, refer to section "CARE Engineering" on page 14 and proceed according to the guidelines stated in Excel 50/500 LonWorks Mechanisms (EN0B-0270GE51).

All the controllers are equipped with a FLASH memory. The complete application with all the parameter and time program settings are saved in the Flash EPROM. Thus, even if these controllers are still in use years later, the applications will start as set by the programmer.

## START-UP SEQUENCE

After powering up the controller or after a RESET the initial screen of the start-up sequence appears. A RESET can be achieved by pressing the 'DOWN' and '-' keys simultaneously.

**NOTE:** The screens of the start-up sequence are always displayed in English as they are a part of the operating system.

**NOTE:** The sequence shown is for embedded applications. The start-up sequence for standard and custom CARE applications is similar but does not include entry of configuration codes. See the PANTHER User Guide (EN2Z-0908GE51), for more details.

```

Firmware
Version
V 2.06.10
      ►NEXT
  
```

This is the first screen of the start-up sequence. It shows the version of the company name, the controller name and the firmware version. Confirm with ENTER.

```

Date:►27.01.2003
Time:►09:56
Ctr  No:►1
      ►NEXT
  
```

Select:

- the 'Date' field to enter the current date.
- the 'Time' field to enter the current time.
- the 'Ctr. No' field to enter the controller number.

Confirm with ENTER.

### If 'Date' Is Selected

Set the date using the '+' or '-' keys. Use the arrow keys to move from field to field. Confirm with ENTER. Select BACK. Confirm with ENTER to return to the previous screen.

**NOTE:** The date must be entered in the following format: DD. MM. YYYY; for example, the 20<sup>th</sup> of September, 2002 must be entered as 20. 09. 2002. Press the CANCEL key to abort the operation or to cancel an incorrect entry before ENTER has been pressed. The value previously displayed will be restored.

### If 'Time' Is Selected

Set the time using the '+' or '-' keys. Use the arrow keys to move from field to field. Confirm with ENTER. Use the CANCEL key to return to the previous screen.

**NOTE:** The time must be entered in the following format: HH:MM in 24 hour clock format; for example: 9:30 a.m. must be 09:30 and 9:30 p.m. must be 21:30. Press the CANCEL key to abort the operation or to cancel an incorrect entry before ENTER has been pressed. The value previously displayed will be restored.

### If 'Ctr. No.' Is Selected

Set the controller number using the '+' or '-' keys. Confirm with ENTER.

Move the cursor to the 'NEXT' field with the ARROW keys. Confirm with ENTER.

```

Modem Part:
<active/inactive>
Appl. Mem. Size
128 KB . ►NEXT
  
```

This screen provides information about whether modem communication is enabled and about application memory size. Enabling modem communication and changing the value for application memory are done in a later screen. NEXT is highlighted. Confirm with ENTER.

```

►Contr. Setup
►Select Applic.
►Requ. Download
►DP Wiring Check
  
```

Select:

- 'Contr. Setup' to configure the controller-specific hardware interfaces.
- 'Select Applic.' to choose the application manually.
- 'Requ. Download' to download an application via XL-Online.
- 'DP Wiring Check' to set up the test mode with default user addresses.

Confirm with ENTER.

## Controller Setup

If 'Contr. Setup' has been selected, the following screen will appear:

```

HW-Interf. Cfg.
►B-Port          ↑
LON-Bus          ↓
  
```

The contents of this listbox will depend upon the exact hardware configuration of the controller. The listed interfaces to be configured will be from among the following:

- B-Port
- LON-Bus

### B-Port

Select 'B-Port' and confirm with ENTER. The following screen appears:

```
B-Port Config.
Baudrate: ▶9600
           ▶BACK
```

Move the cursor with the arrow keys to the field to set baud rate for the B-Port. Use the '+' and '-' keys to edit the fields. Confirm with ENTER.

**NOTE:** Live CARE is now capable of autodetecting the controller baud rate setting, then switching it temporarily to 38.4 Kbaud. When Live CARE is disconnected, the controller will switch back to the previous baud rate setting automatically within 15 seconds.

Move the cursor to the 'BACK' field with the arrow keys. Confirm with ENTER.

## LON-Bus

Select 'LON-Bus' (i.e. LonWorks Network) and confirm with ENTER. The following screen appears:

```
LON-Bus Config.
Contr. Neuron ID
<neuron ID number>
Bus ID      ▶BACK
```

### IMPORTANT

*The bus ID is a non-unique number (i.e. different controllers can have the same bus ID in common) between 0 and 99 (inclusive) which the user can edit after a reset during the controller's start-up sequence or by changing the configuration property nciXL500BusSetup. The factory default is "0".*

This screen displays the unique identification number of the Neuron chip in the controller.

Move the cursor to the 'BACK' field with the arrow keys. Confirm with ENTER.

## Request Download

```
▶Contr. Setup
▶Select Applic.
▶Requ. Download
▶DP Wiring Check
```

If 'Requ. Download' has been selected from the screen shown above, the following screen appears.

```
Please execute
Download
```

Follow the instructions for a download given in the XL-Online User Guide.

**NOTE:** After downloading an application, the controller checks the user ID via its checksum and will not start the application if it is invalid. An alarm "Invalid User ID" will be issued.

## Datapoint Wiring Check

```
▶Contr. Setup
▶Select Applic.
▶Requ. Download
▶DP Wiring Check
```

If 'DP Wiring Check' has been selected from the screen shown above, default user addresses are generated following the following pattern:

- AI0101: Analog input, board 1, input 1
- AO0201: Analog output, board 2, output 1
- DI0301: Digital input, board 3, input 1
- DO0401: Digital output, board 4, output 1

**NOTE:** The board numbers shown above are internal references and are not relevant to the user. In the case of the TIGER, the numbers are fixed for the I/O type, i.e. analog inputs are always AI01, digital inputs are always DI03, etc.

After generating the default addresses, the following screen appears:

```
▶Default Points
▶Alarm History
```

Select

- 'Default Points' to display I/O points for checking values and manually setting outputs for testing.
- 'Alarm History' to display current alarms. This feature allows the system to be checked out by a single person opening and closing inputs and then later reading the alarm buffer to see if they were detected by the controller.

Confirm with ENTER.

If 'Default Points' has been selected, the following screen will be displayed showing all default user addresses and their current values.

```
▶<user addr.> <val>↑
▶<user addr.> <val>1
▶<user addr.> <val>
▶<user addr.> <val>↓
```

To manually set outputs, move the cursor to select the output point from the list box using the arrow keys. Confirm with ENTER.

In the case of analog points, the following screen is displayed.

```

<user addr.>
STATE/VALUE :
  ▶ 0.00%

```

Press ENTER to select the value. Change the value using the '+' or '-' keys. Confirm with ENTER. In the case of digital points, the following screen is displayed.

```

<user addr.>
STATE/VALUE :
  ▶ 0      %

```

Press ENTER to select the value. Change the value/state using the '+' or '-' keys. Confirm with ENTER.

Press CANCEL to return to the previous screen (list of user addresses).

If 'Alarm History' has been selected, the following screen will be displayed showing all points in alarm as well as any system alarms (max. 100 entries):

```

▶<user addr.>      ↑
▶<user addr.>      1
▶<user addr.>
▶<user addr.>      ↓

```

**NOTE:** Alarms are generated for changes of state/value on inputs, which allows shorting and opening the inputs at the switches and/or sensors and then checking the alarm buffer to verify the wiring.

To view an alarm, move the cursor to select the default user address from the list box using the arrow keys. Confirm with ENTER. The following screen will appear:

```

<date.>      <time>
<user addr.>
  <value>
<alarm text>

```

Press CANCEL to return to the previous screen.

### IMPORTANT

*Reset the controller after using the test options to clear the alarm buffer.*

# CARE ENGINEERING

## General

**NOTE:** For detailed descriptions of basic CARE procedures, please refer to the CARE User Guide (EN2B-0182GE51).

In CARE, the TIGER controller must be engineered as an XL500 controller, with the default file set of the Excel 50 controller (OS 2.06 or higher). Like with any other XL5000 controller, with the TIGER controller, too, the controller application must be translated and downloaded as the final step of CARE engineering.

When engineering a TIGER controller application, the following I/O board restrictions must be considered:

- Analog inputs support only NTC resistors and a 0...10 V input signal. PT1000 sensors are not supported.
- Digital inputs support only the slow counter DI functions.

With regards to the engineering of analog and digital outputs, no restrictions apply.

Both TIGER controllers and the CLTG38EXP01 expansion board support different I/O board functionalities as shown in Table 16.

Table 16. I/O board functionality

module type	data-pt. type / subtype	board # / I/O #	
		CLTG38L01 / CLTG38L11	CLTG38EXP01
XF521	analog input	01/01 thru 01/08	06/01 thru 06/08
XF522	analog output	02/01 thru 02/04	02/05 thru 02/08
XF523	digital input	03/01 thru 03/12 07/01 thru 07/02	07/03 thru 07/12 08/01 thru 08/04
XF524	digital output	04/01 thru 04/06 09/01 thru 09/06	11/01 thru 11/06 13/01 thru 13/06
XF525	three-position	05/01 thru 05/03 10/01 thru 10/03	12/01 thru 12/03 14/01 thru 14/03

## CLTG38L01 / CLTG38L11 (with CLTG38EXP01) I/O Assignment

Table 17. Analog inputs, board type XF521

CLTG38L01 / CLTG38L11					CLTG38EXP01				
data-pt. #	board #	I/O #	terminal #	GND term. #	data-pt. #	board #	I/O #	terminal #	GND term. #
AI1	1	01/01	8	14	AI9	6	06/01	8	14
AI2		01/02	9		AI10		06/02	9	
AI3		01/03	10		AI11		06/03	10	
AI4		01/04	11		AI12		06/04	11	
AI5		01/05	23	29	AI13		06/05	23	29
AI6		01/06	24		AI14		06/06	24	
AI7		01/07	25		AI15		06/07	25	
AI8		01/08	26		AI16		06/08	26	

Table 18. Analog outputs, board type XF522

CLTG38L01/ CLTG38L11					CLTG38EXP01				
data-pt. #	board #	I/O #	terminal #	GND term. #	data-pt. #	board #	I/O #	terminal #	GND term. #
AO1	2	02/01	12	15	AO5	2	02/05	12	15
AO2		02/02	13		AO6		02/06	13	
AO3		02/03	27	30	AO7		02/07	27	30
AO4		02/04	28		AO8		02/08	28	

Table 19. Digital inputs, board type XF523

CLTG38L01 / CLTG38L11					CLTG38EXP01				
data-pt. #	board #	I/O #	terminal #	10...24 Vac/dc	data-pt. #	board #	I/O #	terminal #	10...24 Vac/dc
DI1	3	03/01	1	external	DI15	7	07/03	1	external
DI2		03/02	2		DI16		07/04	2	
DI3		03/03	3		DI17		07/05	3	
DI4		03/04	4		DI18		07/06	4	
DI5		03/05	5		DI19		07/07	5	
DI6		03/06	6		DI20		07/08	6	
DI7		03/07	7		DI21		07/09	7	
DI8		03/08	16		DI22		07/10	16	
DI9		03/09	17		DI23		07/11	17	
DI10		03/10	18		DI24		07/12	18	
DI11		03/11	19		DI25	8	08/01	19	
DI12		03/12	20		DI26		08/02	20	
DI13	7	07/01	21		DI27		08/03	21	
DI14		07/02	22		DI28		08/04	22	

Table 20. Digital outputs, board type XF524

CLTG38L01 / CLTG38L11					CLTG38EXP01						
data-pt. #	board #	I/O #	terminal #		COM	data-pt. #	board #	I/O #	terminal #		COM
DO1	4	04/01	NC1	53	54	DO13	11	11/01	NC1	53	54
			NO1	55					NO1	55	
DO2		04/02	NO2	51	52	DO14		11/02	NO2	51	52
DO3		04/03	NO3	50		DO15		11/03	NO3	50	
DO4		04/04	NO4	49		DO16		11/04	NO4	49	
DO5		04/05	NC5	48	47	DO17		11/05	NC5	48	47
			NO5	46					NO5	46	
DO6			04/06	NO6	44	45		DO18	11/06	NO6	44
DO7	9	09/01	NO7	43	DO19		13/01	NO7	43		
DO8		09/02	NO8	42	DO20		13/02	NO8	42		
DO9		09/03	NC9	41	40	DO21	13/03	NC9	41	40	
			NO9	39				NO9	39		
DO10		09/04	NO10	37	38	DO22	13/04	NO10	37	38	
DO11		09/05	NO11	36		DO23	13/05	NO11	36		
DO12		09/06	NO12	35		DO24	13/06	NO12	35		



## Three-Position Outputs

You can create as many analog outputs of the subtype "three-position" as you need and are possible given the controller's limitations. This is done using either of the following two procedures:

- using the "Plant/Create/HW/SW Point(s)" command in the logical plant tree (see section "Basic Steps", sub-section "Create Plant Schematic" in the CARE User Guide):

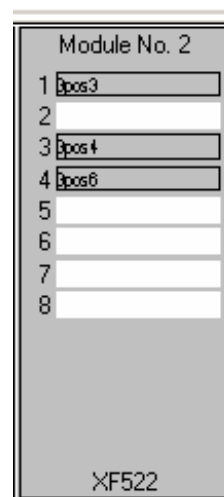
or

- opening the plant schematic and using the "Edit/Point without graphic" command (see section "Plant Schematics", sub-section "Points without Graphic" in the CARE User Guide):

## Three-Position Output Assignment to Analog Outputs

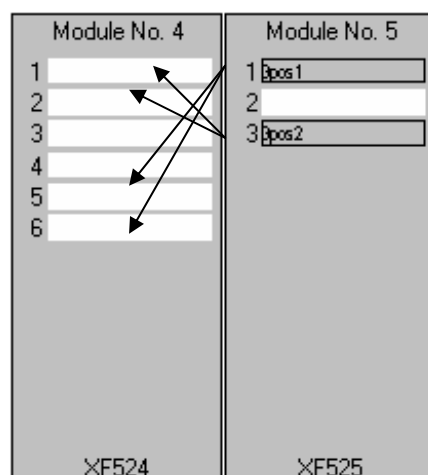
You can assign any three-position output to any analog output on a XF522 board. In this case, that analog output will automatically be configured as an MCD3 - relay signal output.

For general procedures on terminal assignment, refer to section "Terminal Assignment" in the CARE User Guide.



## Three-Position Output Assignment to Digital Outputs

In this case, you must add three-position boards of type XF525 and assign the three-position outputs to them.



Every three-position output always has a fixed assignment to a pair of digital outputs as shown in the following tables.

### IMPORTANT

*The pair of digital outputs assigned to a three-position output cannot be used as a normal digital output. The programmer is responsible for avoiding duplicate assignments. CARE does not recognize these duplicate assignments.*

Table 21. CLTG38L01 /CLTG38L11

three-position output				assigned digital output pair						
board type	data-pt. #	board #	I/O #	board type	data-pt. #	board #	I/O #	terminal #		COM
XF525	MOT1	5	05/01	XF524	DO6 DO5	4	04/06 04/05	NO6 (closed) NO5 (open)	44 46	45* 47*
	MOT2		05/02		DO4 DO3		04/04 04/03	NO4 (closed) NO3 (open)	49 50	52
	MOT3		05/03		DO2 DO1		04/02 04/01	NO2 (closed) NO1 (open)	51 55	52* 54*
	MOT1	10	10/01		DO12 DO11	9	09/06 09/05	NO12 (closed) NO11 (open)	35 36	38
	MOT2		10/02		DO10 DO9		09/04 09/03	NO10 (closed) NO9 (open)	37 43	38* 40*
	MOT3		10/03		DO8 DO7		09/02 09/01	NO8 (closed) NO7 (open)	42 43	45

\*Short-circuit the two COM terminals.

Table 22. CLTG38L01 / CLTG38L11 (with CLTG38EXPNO1)

three-position output				assigned digital output pair						
board type	data-pt. #	board #	I/O #	board type	data-pt. #	board #	I/O #	terminal #		COM
XF525	MOT1	12	12/1	XF524	DO18 DO17	11	11/6 11/5	NO6 (closed) NO5 (open)	44 46	45 47
	MOT2		12/2		DO16 DO15		11/4 11/3	NO4 (closed) NO3 (open)	49 50	52
	MOT3		12/3		DO14 DO13		11/2 11/1	NO2 (closed) NO1 (open)	51 55	52 54
	MOT1	14	14/1		DO24 DO23	13	13/6 13/5	NO12 (closed) NO11 (open)	35 36	38
	MOT2		14/02		DO22 DO21		13/04 13/03	NO10 (closed) NO9 (open)	37 43	38 40
	MOT3		14/03		DO20 DO19		13/02 13/01	NO8 (closed) NO7 (open)	42 43	45

\*Short-circuit the two COM terminals.

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